MANAGEMENT DISCUSSION & ANALYSIS REPORT

The last couple of years have been dramatic for the global economy, with pandemic-induced supply chain disruptions, the war in Ukraine and West Asia, the surge in inflation, and monetary policy tightening adding to the uncertainties. Despite these challenges, the global economy has demonstrated remarkable resilience, maintaining a steady growth trajectory in 2023. Notwithstanding concerns of stagflation and recession, the global economy appears to be on a path towards a soft landing. Inflation, which had reached multi-decade highs in 2022, has also shown signs of easing, although it remains above targets of pre-pandemic levels in major economies. This global trend of easing inflation is paving the way for potential monetary easing by global central banks, further stabilizing the economic landscape.

GLOBAL ECONOMY

Global GDP growth moderated to 3.2% in 2023, from 3.5% in 2022, according to the International Monetary Fund (IMF). The IMF projects growth to remain steady at 3.2% in 2024 and 3.3% in 2025. This pace is slower than the historical annual average of 3.8% between 2000 and 2019. Several factors contribute to the moderate growth forecast for this year and the next, including high interest rates, the unwinding of fiscal expansion, the wars in Ukraine and West Asia, weak productivity growth, and increasing geo-economic fragmentation—the policy-driven reversal of cross-border economic integration.

Recent high-frequency data indicators suggest that global growth is picking up. The Global Manufacturing PMI rose to a 22-month high in May, suggesting a steady improvement in 2024 after almost one and a half years of decline. Global headline inflation sharply declined in 2023 but remains above targets. The IMF forecasts further moderation to 5.9% in 2024 and 4.5% in 2025, with advanced economies leading the decline.

Risks to the global economic landscape have diminished in the last few months. According to the IMF, risks to their projections on GDP growth and inflation are now broadly balanced.

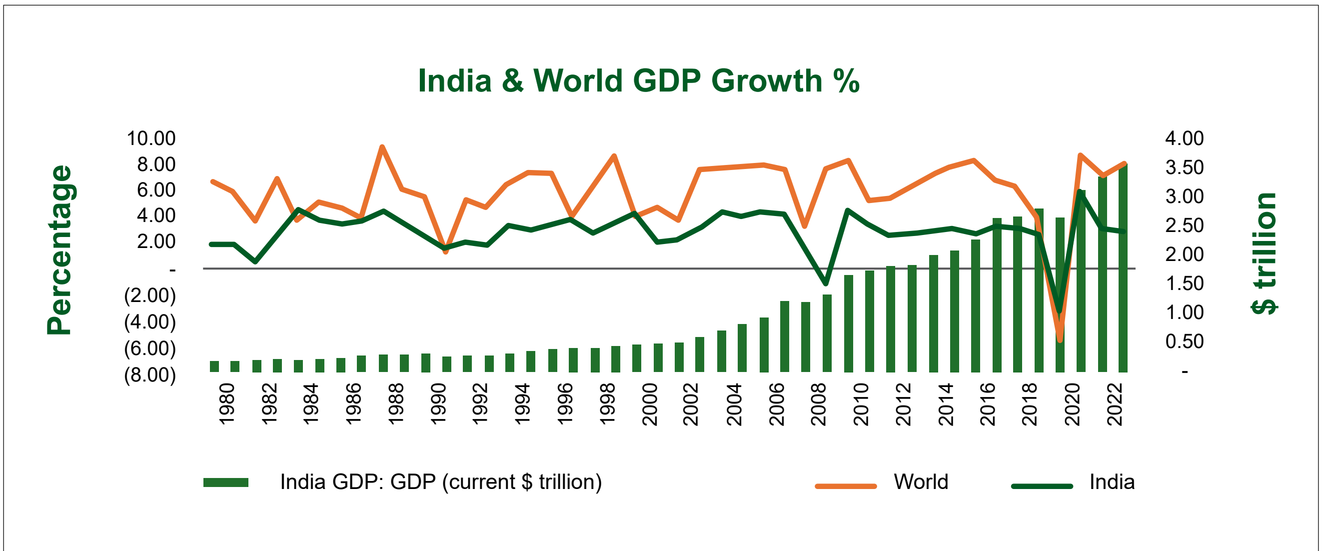
The pandemic-induced high budget deficits and the subsequent increase in debt-to-GDP ratios remain elevated, raising the debt burden of many economies. Interest payments, as a percentage of government revenues, have grown sharply post the pandemic, reducing the capacity of many countries to increase capital investments materially.

Global trade experienced a decline of 1.2% in 2023 due to lingering impacts of high energy costs and inflation. While merchandise exports suffered due to falling commodity prices, commercial services, particularly travel and digital services, thrived. The World Trade Organization forecasts a trade rebound in 2024 and 2025, though geopolitical tensions and economic uncertainties pose significant risks.

With inflation coming down, global central banks are projected to cut interest rates in 2024. However, with the pace of disinflation slower than expected, the timing of these cuts is continually being pushed back.

INDIAN ECONOMY

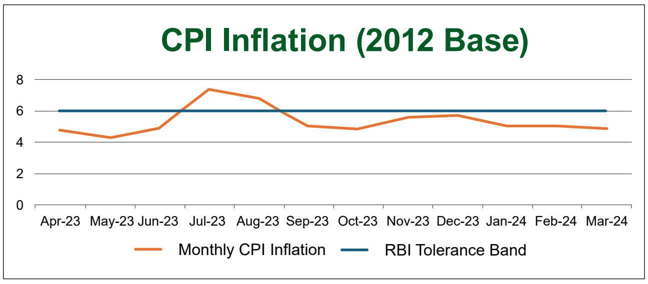
Global uncertainties notwithstanding, India continues to be a standout performer. According to the National Statistical Office's provisional estimates, the growth in the Indian economy accelerated to 8.2% in 2023-24 from 7.0% in 2022-23. This is the fastest GDP growth since 2016-17, if one leaves out the pandemic-induced rebound in 2021-22. The robust growth, in the backdrop of a global slowdown and high interest rates, has been driven by strong domestic demand and capital investment.



The GDP growth in 2023-24 is sharply higher than the 6.5% projected by the Reserve Bank of India at the beginning of the year. The growth in gross value added was 7.2% in 2023-24, up from 6.7% a year ago. Among the broad sectors in the economy, industry rebounded during the year. The primary sector grew 2.1%, below the historical average, due to the below-normal southwest monsoon in 2023. The secondary sector grew 9.7% in 2023-24, while the growth in the tertiary sector moderated to 7.6% from double digits in the previous year.

India's GDP growth in the last few years seems to have been fuelled by the government's focus on capital expenditure. Gross fixed capital formation, an indicator of investments in the economy, grew 9.0% in 2023-24. The budget has been focusing on capital expenditure, which has more than tripled in the last five years to ₹11.11 trillion in 2024-25.

As was the case globally, inflation in India moderated in 2023-24 due to monetary policy tightening, supply management measures, and easing of input cost pressures. Average CPI inflation moderated to 5.4% in 2023-24 from 6.7% in the previous year. Barring July and August, when vegetable prices pushed up headline inflation, inflation remained within the Reserve Bank of India's medium-term target range of 2-6%.

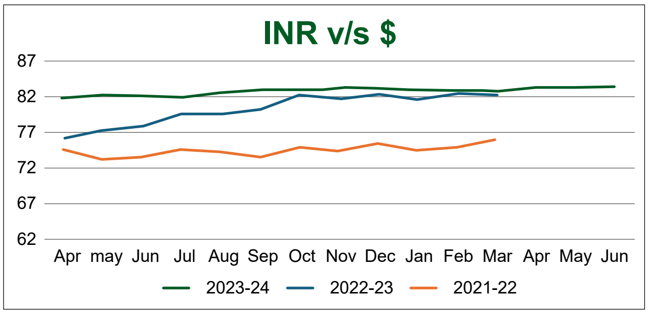


Core inflation, which excludes volatile food and fuel items, was 3.4% in March, suggesting abating inflationary pressures in the economy. Food inflation remained volatile due to recurrent supply shocks, while fuel has been in deflation since September due to softening global energy prices.

The RBI maintained its key interest rate at 6.5% despite easing inflation, aiming to anchor inflation expectations. A rate cut is anticipated in 2024-25, depending on inflation's trajectory and global central bank actions.

In May, S&P Global Ratings raised its outlook on India's rating to positive from stable, setting the stage for a possible ratings upgrade in India's sovereign credit rating from the current 'BBB-'. The ratings agency said India's credit rating could improve over the next 24 months if the government's high debt and interest burden declined due to prudent fiscal and monetary policies and the economy remained resilient.

The Indian Rupee depreciated 1.4% against the US dollar in 2023-24. The rupee's depreciation is more a reflection of the dollar's appreciation due to record high interest rates in the US than the macroeconomic fundamentals of the Indian economy. India's strong economic growth and the projected foreign portfolio inflows of $ 25 billion to $ 30 billion by March 2025, due to the inclusion of Indian government bonds on the global bond indices, are likely to reduce pressure on the rupee in the current financial year.



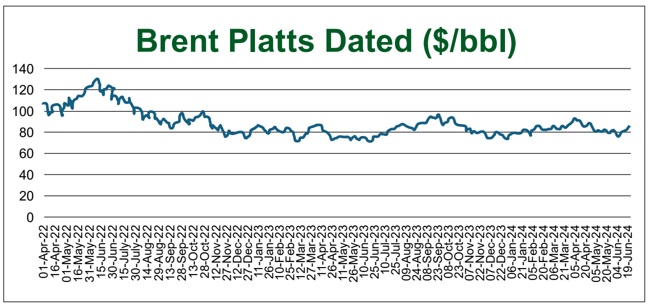
With its strong growth and sound macroeconomic fundamentals, India seems to be in the right place to take advantage of the China Plus One strategy, which involves multinational companies broadening their supply chains and production facilities outside China.

India continues to be an oasis of growth and stability amid global uncertainties. The country remained the world's fastest-growing major economy in 2023-24. The Reserve Bank of India has projected the Indian economy to grow 7.2% in 2024-25, while the IMF has projected it at 7%. The outlook for next year looks buoyant, given the government's continued focus on capital expenditure. Strong corporate balance sheets, rising capacity utilization, double-digit credit growth, a healthy financial sector, and ongoing disinflation are likely to aid growth in 2024-25.

GLOBAL OIL & GAS SECTOR TRENDS

The world witnessed new fronts open for geopolitical tensions, leading to significant turbulence in the global energy markets, including the Oil & Gas sector. Volatility remained high, and supply chain disruptions persisted throughout 2023 and well into 2024. There were fluctuations in the availability and prices of key energy commodities, such as crude oil, natural gas and coal.

Last financial year, Brent crude prices saw significant swings. Driven by geopolitical tensions and OPEC+ production cuts, prices rose to about $ 85 per barrel in April 2023 to peak at $ 95 in October due to increased demand and supply disruptions, including on account of the geopolitical tensions in west Asia and also the disruption in the Red Sea route. They, however, fell sharply in November and December to hit about $ 74 in early December as non-OPEC+ supply strength coincided with slowing growth in global oil demand.



The latest OPEC+ meeting decided to extend most of its oil output cuts well into 2025, due to weak demand growth, high interest rates, and rising production from non-OPEC producers. OPEC+ members are currently cutting output by a total of 5.86 million barrels per day (bpd), or about 5.7% of global demand. Those include 3.66 million bpd of cuts, which were due to expire at the end of 2024, and 2.2 million bpd of voluntary output reduction by eight members, set to expire at the end of June 2024. OPEC+ has now agreed to extend the cuts of 3.66 million bpd by a year until the end of 2025, and prolong the cuts of 2.2 million bpd by three months until the end of September 2024.

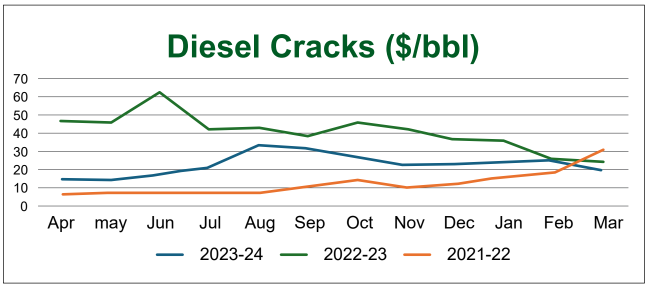
Worries over slow growth in demand from China have weighed on prices alongside rising oil inventories in the developed economies. The expected interest rate cuts by developed countries to boost their economies have not materialized due to persisting high inflation. Oil suppliers are worried that unless interest rates ease, the demand for oil will not rise.

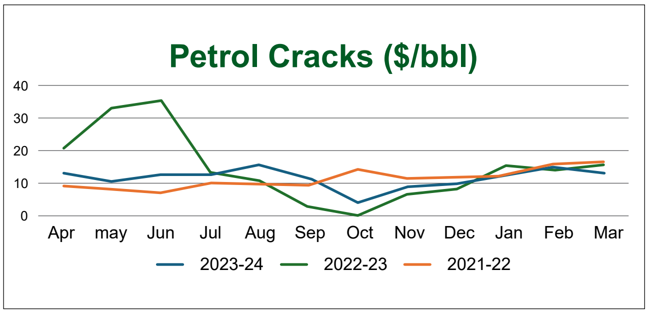
Throughout 2023, gasoline and gasoil cracks were volatile. Diesel cracks, in particular, faced pressure on multiple fronts. Weak industrial activity and a mild winter in Europe led to reduced diesel consumption. This, coupled with a declining share of diesel cars in Europe, resulted in a 210 kb/d annual contraction in 2023 in European gasoil demand. These factors caused diesel cracks to fall sharply, significantly impacting refinery margins, which fell to near two-year lows by early 2024. Gasoline cracks remained relatively stronger throughout most of 2023, driven by robust personal consumption.

Global demand for gasoline is set to rise from 27 million bpd in 2023-24 to 27.28 million bpd in the following year, a modest increase of 0.3 million bpd. Gasoil, on the other hand, is expected to see a more subdued growth, climbing from 29.07 million bpd to 29.21 million bpd, representing an increase of only 0.14 million bpd.

Gasoline cracks were volatile in 2023-24, influenced by factors such as strong US and Asian demand, refinery outages and export dynamics. While cracks were robust in the initial part of the year, they weakened during winter before recovering. For 2024-25, gasoline cracks are expected to remain volatile, with a downward trend in winter due to seasonal demand fluctuations. Factors such as US driving season, Asian demand, refinery operations and new capacity will impact crack levels.

During H1 of FY 2023-24, gasoil cracks were strong due to robust demand, refinery issues and export restrictions. However, the outlook for 2024-25 is less optimistic, due to weakening economic conditions and increased refining capacity. Factors such as European and Chinese demand, arbitrage flows, and new refinery start-ups will be crucial in determining gasoil crack levels.





The global gas market experienced a tumultuous period, marked by unprecedented volatility in 2022. The Russia-Ukraine conflict exacerbated existing supply shortages, sending prices to record highs and impacting consumers worldwide, particularly in developing nations. Europe, heavily reliant on Russian gas, swiftly responded by expanding LNG import infrastructure and maximizing storage. However, the underlying global gas supply constraint persisted, highlighting the market's vulnerability.

Building on the momentum of the previous year, global LNG trade expanded modestly in 2023. While prices retreated from 2022's peak, supply limitations continued to influence market dynamics. A new liquefaction facility in Indonesia and reduced demand in Europe and Asia contributed to market rebalancing. Despite these factors, Asia, where gas remains a preferred fuel, increased LNG imports to bolster energy security and diversify its energy mix.

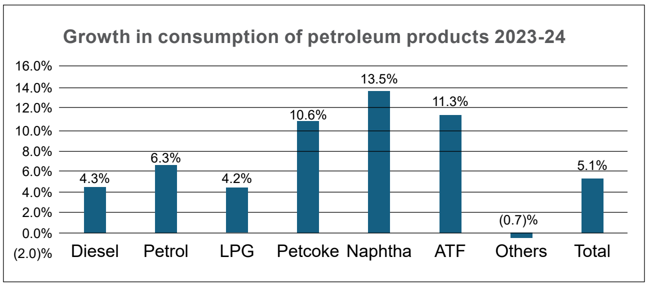
The United States emerged as a dominant player, accounting for the majority of the increased LNG supply in 2023. Recognizing the tight supply and geopolitical risks, major importers implemented strategic measures, including joint purchasing mechanisms and strategic LNG reserves. As prices ease, demand for gas is expected to rise in the coming years. However, the market may remain tight due to challenges in expanding liquefaction capacity and securing sufficient feed gas.

INDIAN OIL & GAS SECTOR

The fiscal year 2023-24 saw significant growth and strategic advancements for India's Oil & Gas sector. Diversified crude oil sources and lower global crude oil prices contributed to a reduced import bill, showcasing the sector's resilience despite increased petroleum product consumption. The country's refining capacity continued to expand, meeting both domestic and international demand, while efforts to boost domestic production remained a priority. The strategic capital investments and the performance of key refiners in terms of GRMs highlighted the sector's robust infrastructure and operational efficiency. As India continues to navigate the global energy landscape, the focus remains on enhancing energy security, expanding refining capacities, and promoting sustainable energy practices.

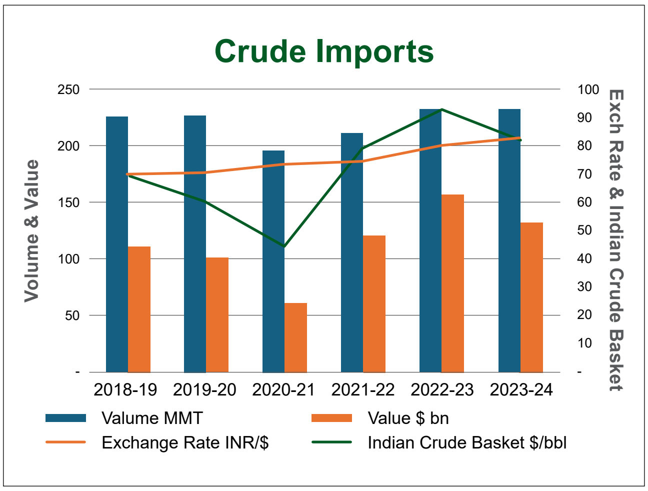
India has a diversified and secure energy portfolio, with its basket of import markets comprising 39 countries. A mix of long-term contracts, foreign assets, and a participative role in international energy organizations has ensured an India-first and people-centric approach in the energy sector.

In the fiscal year 2023-24, India's petroleum sector saw a significant increase in the consumption of petroleum products. The total consumption rose to 234.3 million Metric Tonnes (MMT), a 5.06% increase from 223 MMT in the fiscal year 2022-23. This surge was driven by key products: High Speed Diesel (HSD) increased 4% to 89.6 MMT, Motor Spirit (MS) or petrol grew 6% to 37.2 MMT, Aviation Turbine Fuel (ATF) rose 11% to 8.2 MMT, and Naphtha consumption grew 13% to 13.8 MMT. The increased consumption reflects heightened economic activity, greater mobility and robust industrial demand.

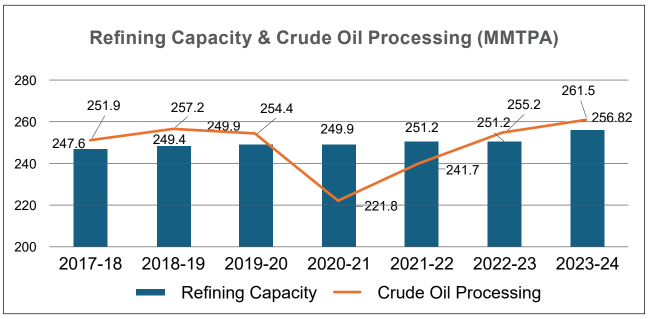


Diesel, a major component of petroleum product consumption, grew 4% over the previous fiscal year, primarily due to the enhanced movement of goods and increased transportation needs. Petrol consumption also increased substantially, with a 6 % growth driven by a rise in personal vehicle usage and expanding vehicle ownership. The consumption of Liquefied Petroleum Gas (LPG) remained robust, supported by the government's continued efforts to promote clean cooking fuel through schemes like the Pradhan Mantri Ujjwala Yojana (PMUY). In the fiscal year 2023-24, India's LPG consumption was 29.7 MMT, compared with 28.5 MMT in 2022-23.

The country's crude oil import dependency increased to a record high of 87.8%, as domestic production couldn't keep pace with rising consumption. However, the crude oil import bill reduced by 16% year-on-year due to a sharp decline in global prices and diversified crude oil sources. India, the world's third-largest consumer of crude oil and one of its leading importers, is also a net exporter of petroleum products. In 2023-24, India exported 62.4 MMT of petroleum products, compared with 61.0 MMT in 2022-23. The value of these exports was, however, down year-on-year at $ 47.7 billion in 2023-24 from $ 57.3 billion.



India's indigenous crude oil production saw marginal growth in the fiscal year 2023-24. The total domestic crude oil production was 29.4 MMT, compared with 29.2 MMT in the previous fiscal year, indicating a slight increase of 0.6%. India's refining sector demonstrated remarkable efficiency and capacity utilization in the fiscal year 2023-24. The total crude oil processed by Indian refineries increased to 261.5 MMT from 255.2 MMT in the previous year, marking a 2.5% increase. This growth highlights the country's ability to meet both, domestic and export demands for petroleum products. Among refined products, HSD accounted for the largest share, followed by MS and ATF. The production of diesel rose 2% to 115.9 MMT, petrol by 5% to 45 MMT, and ATF by an impressive 14% to 17.1 MMT, reflecting the growing demand across the transportation and industrial sectors. LPG production was flat at 12.8 MMT.



The gross natural gas production in 2023-2024 was 36,438 million Metric Standard Cubic Meters (MMSCM), a 5.7% increase from the previous year. The total natural gas consumption, including internal consumption, was 67,512 MMSCM for the year, a 12.5% increase from the previous fiscal year. LNG imports for the fiscal year 2023-24 showed a significant increase of 20.8% to 31,795 MMSCM or $ 13.3 billion.

Ethanol blending with petrol reached 12.8% in March 2024, with cumulative blending from November 2023 to March 2024 at 12.0%, showing progress in the government's ethanol blending program. The government has also introduced Compressed Bio-Gas (CBG) Blending obligation from FY 2025-26. This initiative aims to integrate CBG into the city gas network, thereby ensuring a greener and more efficient energy distribution system. Under the government's Sustainable Alternative Towards Affordable Transportation (SATAT) initiative, 58 CBG plants have been commissioned, and another 53 are in various stages of completion.

India is poised to significantly expand its role in global oil markets over the remainder of the decade, driven by robust economic growth, demographic shifts and urbanization. The country is set to become the largest contributor to global oil demand growth from now until 2030. Factors such as increased urbanization, industrialization, the rise of a wealthier middle class with greater mobility and tourism aspirations, and efforts to enhance access to clean cooking will drive this demand increase. Consequently, by 2030, India's oil demand is projected to rise to 6.6 million bpd, an increase by nearly 1.2 million bpd, representing over one-third of the anticipated global increase of 3.2 million bpd.

THREATS & OPPORTUNITIES

Oil and gas sectors, global and domestic, are poised at a critical juncture. In the coming years, they will face numerous challenges as well as opportunities. These years will be marked by significant transitions driven by geopolitical, environmental, regulatory and technological changes.

The recent geopolitical conflict and subsequent energy price volatility have underscored the critical importance of energy security. Developing nations, in particular, have been severely impacted, with vulnerable populations bearing the brunt of soaring energy costs. This has led to a surge in energy poverty, forcing millions to revert to harmful cooking methods. As a result, the energy sector is now prioritizing energy security, affordability and sustainability as fundamental pillars for a resilient and equitable energy future.

April 2024 marked the eleventh consecutive month to break temperature records, surpassing the pre-industrial average by a significant 1.58°C. This unprecedented warming trend underscores the urgent need for global action to mitigate climate impacts.

The COP28 Climate Summit, held in the UAE in December 2023, was the first global stocktaking of progress under the 2015 Paris climate agreement. While no blanket decisions were taken to phase out coal, oil and gas, the conference agreed to triple new investments in renewable energy and transition away from fossil fuels in energy systems.

Forecasts on future energy demand are highly divergent, with organizations like the IEA and OPEC presenting starkly contrasting outlooks. This uncertainty, compounded by conflicting net-zero scenarios, undermines investor confidence, jeopardizes energy security, and complicates transition planning. Moreover, deep divisions between developed and developing nations over the pace, pathways, and financing of the energy transition create additional challenges. The result is a complex and unpredictable energy landscape, fraught with risks for policymakers, businesses, and consumers alike.

Addressing the world's increasing energy demands, while cutting greenhouse gas emissions, will necessitate a diverse array of energy sources and technologies, each advancing at different rates based on domestic conditions, priorities, and financial and technological capabilities. Maintaining a global demand-supply balance will be crucial, requiring adequate investment in both fossil & clean energy sectors, to prevent significant price shocks.

In recent years, concerns have emerged that the focus on green energy might lead to severe underinvestment in the oil and gas industry, potentially causing more frequent energy price shocks. At the B20 meeting, part of the G20 meetings under India's chairmanship, it was strongly emphasized that urgent efforts must be made to maintain robust existing energy systems, which are heavily reliant on fossil fuels, to protect consumers and the global economy from such price shocks.

Several European countries, hitherto leaders in energy transition and clean energy investments, have increased their use of coal for power production, following the spike in gas prices caused by Russia's invasion of Ukraine. India has been advocating for necessary investments in oil and gas projects to meet global demand, while also accelerating the transition to green energy.

India is on a journey to become a developed nation by 2047. The growing economy, industrialization and urbanization will see its energy demand soar. By some estimates, India will become the world's largest source of oil demand growth, accounting for over one-third of global oil demand growth by 2030. India is balancing out investments in clean energy and traditional fuels, although the emphasis is heavily on sustainable energy. The nation's infrastructure-building mission will see unprecedented investments in the energy sector. India will continue to expand its energy capacity to meet these demands. Projections indicate that India's primary energy demand will double by 2045, implying a surge from the current 19 million barrels of oil equivalent per day to 38 million barrels of oil equivalent per day by 2045. India expects to raise its refining capacity to 450 MMTPA from 256 MMTPA. In line with the trend, the country will continue to look to step up its exports of petrochemicals and other finished products. India also aims to achieve Net Zero by 2070, and this transformation could be massive. India has emerged as a significant player in the global energy sector, not only meeting its own needs but also shaping global energy demand.

India's economic development and relatively low per-capita fuel consumption will fuel growth in the manufacturing, commerce, transport and agriculture sectors and this is expected to drive significant increases in diesel usage. Even as the presence of Electric Vehicles grows in India, transportation-fuel demand is expected to continue. Diesel will lead the demand for the product mix, according to most estimates. It could account for almost 50% of all incremental oil demand for the next six years. Due to high economic growth, demand for ATF will rise by about 6% each year, and the widening base of the middle class will boost tourism, luxury, and pilgrim travel. Jet fuel will be gradually substituted by Sustainable Aviation Fuel (SAF) due to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) mandates.

India is focussing heavily on **Natural Gas**, whose share in the energy mix is expected to more than double to 15% from about 6% presently. India's natural gas demand rose to 64 billion cubic meters in 2023. The demand for natural gas is expected to rise by 6% in 2024, led by demand from the fertilizer and power sectors.

Growth in LPG demand is expected to decline after seven to eight years, ceding ground to Piped Natural Gas (PNG), for which massive **City Gas Distribution** (CGD) grid expansion is underway, and then to the electrification of cooking. The CGD network will continue to be an area of growth for energy companies, as there is a greater shift towards urbanization and a growing preference for apartment complexes, even in smaller cities.

India's **Petrochemical** sector is on a robust growth trajectory, with substantial investments and capacity additions expected to cater to the burgeoning demand, both domestically and internationally. Indian refiners are increasingly focusing on petrochemical production to diversify their product slate and reduce overdependence on transport fuels. The aim is to transform India into a net exporter of petrochemicals, while maintaining a smaller carbon footprint. This growth in the segment is driven by low per-capita consumption, increasing export demand and supportive government policies, such as the Production Linked Incentive Scheme (PLIS), to boost domestic manufacturing and exports.

India's **Renewable Energy** sector is set for significant growth and innovation, driven by ambitious capacity expansion targets. The goal of reaching 500 GW of renewable energy capacity by 2030 underscores India's dedication to a greener future. The rapid increase in renewable capacity, particularly in solar energy, is anticipated to continue at a significant pace, strengthening India's position as a global leader in renewable energy adoption. To harness this momentum, ongoing investment in renewable energy infrastructure, supportive policies, and technological advancements will be crucial. There are several challenges to address in the coming days, including financing, grid integration, land availability, and importantly, storage.

The government has launched several initiatives to support these ambitious goals. One of the most notable is the PM-Surya Ghar Muft Bijli Yojana, which aims to provide substantial subsidies for residential rooftop solar installations. This scheme targets 10 million households and aims to add 30 GW of solar capacity.

Last year, India launched the **Green Hydrogen** Mission, aiming to position the country as a global leader in green hydrogen production and export. The target is to produce 5 MMT of green hydrogen annually by 2030. The ambitious target is backed by a comprehensive policy framework that includes financial incentives, regulatory support, and infrastructure development. Key components of the mission encompass the development of hydrogen production plants, electrolyzers, and fuel cell technologies, alongside the establishment of a robust supply chain and storage infrastructure. By leading the green hydrogen revolution, India aims to spearhead sustainable energy solutions and global climate action. This mission gives Indian energy companies opportunities to participate in and benefit from the growing green hydrogen market.

India's renewable potential is among the highest globally, with abundant renewable energy capacity, India's is positioned to be one of the lowest-cost producers of green hydrogen, setting the stage for it to become a leader in this sector. With the significant decrease in renewable power costs, particularly solar, India can leverage its vast solar and renewable resources to produce hydrogen through water electrolysis. Numerous Indian energy companies, both public and private, have outlined ambitious plans for green hydrogen production.

Amendments to the National **Biofuel** Policy have accelerated the target for achieving 20% ethanol blending in petrol to 2025-26 and broadened the scope of eligible feedstocks. The SATAT initiative promotes CBG, aiming to establish 5,000 plants by 2024. India is now the world's third-largest ethanol producer, with blending levels reaching nearly 12% by 2023. The target is to achieve 20% by 2025-26, using sugarcane, maize and surplus rice as feedstock. Additionally, the country aims for 5% biodiesel blending by 2030 and has set initial bio-jet fuel blending (SAF) targets of 1% by 2027 and 2% by 2028.

India is leading the Global Biofuels Alliance (GBA), a key initiative under its G20 presidency. This alliance aims to enhance international cooperation, increase the use of sustainable biofuels, and support global biofuels trade and national biofuel programs through technical assistance. The GBA, initiated by India in collaboration with the United States and Brazil, has nine founding members. US and Brazil are recognized as global leaders in biofuels, accounting for 52% and 30% of global ethanol production, respectively. Despite biofuels' significant potential, the sector faces challenges such as feedstock supply issues, technological limitations, policy frameworks, and financing.

Recent geopolitical events have starkly revealed the vulnerabilities of the global energy system, necessitating a delicate balance between sustainability goals and energy security. Reflecting this complex reality, upstream investments are rebounding significantly in 2024, surpassing both recent lows and historical averages. While the long-term trajectory points towards a reduced reliance on oil and gas, these fossil fuels will remain indispensable for the foreseeable future.

RISKS, CONCERNS & OUTLOOK

Energy markets have been characterized by nations' strategic manoeuvring to secure energy resources amid global uncertainties. The Russia-Ukraine war and the conflict in West Asia have heightened the concerns over energy security, prompting countries to diversify energy sources. This geopolitical tension has accelerated the global shift towards renewables, with nations striving for energy independence and stability in an increasingly volatile landscape.

Geopolitical tensions remain a critical threat. Conflicts have disrupted energy supply chains and caused volatility in oil and gas prices. This instability threatens energy security for many countries, prompting them to seek alternative sources and accelerate the transition to renewables, which might not yet be fully capable of meeting demand. The transition poses its own set of challenges. While the shift to greener energy sources is necessary to combat climate change, it requires substantial investments in infrastructure, technology, grid modernization and access to critical minerals. The intermittency of renewable sources like solar and wind further complicates this transition, necessitating advanced energy storage solutions and smarter grids, which are still developing.

Oil & Gas companies operate in a tough combination of sticky inflation, geopolitical tensions, and economic slowdowns. Rising inflation can increase the cost of energy production, transportation, and infrastructure development, potentially leading to higher energy prices. Geopolitical tensions, such as conflicts or trade disputes, can disrupt supply chains and create volatility in energy markets. Economic slowdowns, particularly in major economies like the USA, China, and the EU, can result in decreased investment in new projects leading to supply challenges. Furthermore, regulatory inconsistencies and cybersecurity threats add to the complexity of the energy landscape.

OPEC+ has influenced global oil prices through production adjustments in recent years. However, the future impact of these measures is uncertain, as it hinges on factors such as the global economic recovery, evolving demand patterns, and the accelerating energy transition. While an economic rebound could boost oil demand, leading to potential price increases if supply remains constrained, OPEC+'s ability to maintain coordinated production strategies will be crucial in shaping market dynamics. Ultimately, the effectiveness of OPEC+'s actions will be determined by external forces, including geopolitical tensions, technological advancements, and the broader trajectory of global energy policies.

The biggest energy market risks stem from supply disruptions, price volatility, and the energy transition. Geopolitical conflicts or natural disasters can disrupt supply, causing sudden price spikes that strain economies and fuel inflation. The transition to renewable energy, while necessary for long-term sustainability, also presents challenges. It requires massive investments and can lead to short-term economic disruptions, particularly in regions heavily reliant on fossil fuel industries. Underinvestment in renewable energy could exacerbate price spikes as investments in fossil fuels decline. To navigate these risks effectively, governments, industries, and international organizations need to collaborate on ensuring stable energy supplies, manageable transitions, and resilient economies.

Regulatory and policy uncertainties pose additional global risks. Inconsistent policies and changing regulations create an unstable environment for energy investments. Countries must establish clear, long-term strategies that support the energy transition, while guaranteeing a reliable and affordable energy supply. Furthermore, the increasing digitization of the energy sector makes it more vulnerable to cyberattacks on critical infrastructure. Such attacks could disrupt energy supplies, inflict significant economic damage, and pose safety risks. Addressing these challenges requires coordinated global efforts, innovative technological advancements, and robust policies to ensure a secure, sustainable, and resilient energy future.

India has strategically diversified its crude oil supply sources to mitigate the risks of supply disruptions caused by geopolitical tensions and to safeguard against price volatility associated with overreliance on a single oil source. Additionally, currency fluctuations and global oil demand variations could impact the cost and stability of these imports.

With the upgrade of India's credit rating outlook, the country is on track for a rating upgrade in the coming months; this should boost India and our Company's ability to raise funds in a stable and cost-effective manner. The exchange rate has exhibited relatively low volatility despite the two-way capital flows and uncertain interest rate outlook globally.

Operating safely and responsibly is crucial in the inherently hazardous oil and gas industry. BPCL prioritizes the safety of assets and people, along with environmental protection; hence, it rigorously enforces established safety systems and processes while enhancing disaster management capabilities. Regular workforce training and education ensure adherence to standard procedures, minimizing human error. The Company fosters a safety culture through periodic simulated stress tests and by maintaining assets to prevent breakdowns and accidents, thereby ensuring operational efficiency. Significant resources are allocated to these efforts. With advancements in technology and digital infrastructure, the Company also focuses on mitigating cyberattack risks to prevent financial loss, supply chain disruptions, and reputational damage. Controlled hackathons are employed as a preventive measure.

While geopolitical tensions and supply chain disruptions are potential hurdles, BPCL is proactively adapting to the evolving energy landscape by diversifying its business and embracing sustainability. The Company's ambitious strategy, 'Project Aspire,' which has a planned capital outlay of ₹1.7 lakh crore over five years, will fuel the next wave of growth. While nurturing the Core businesses of Refining, Marketing and Upstream, we are investing in 'Future Big Bets' which are anchored on five key areas: Gas, Non-fuel Retailing, Petrochemicals, Green Energy Businesses, and Digital Ventures. Committed to environmental responsibility, BPCL is targeting Net Zero emissions for both Scope 1 & Scope 2 by 2040. This would require a phased capital outlay of approximately ₹1 lakh crore till 2040 and the Company is geared for the same.

PERFORMANCE

REFINERIES

BPCL is pleased to report a year of significant achievements in Refining in FY 2023-24. The Refineries processed the highest ever crude throughput of 39.93 million Metric Tonnes Per Annum (MMTPA), surpassing the previous year's record of 38.53 MMTPA. This success comes amidst a backdrop of challenges for the Oil & Gas industry, marked by dwindling product cracks, volatile prices and dynamic geo-political interventions. Throughput exceeded the design capacity and registered an impressive average capacity utilization of 112% vis-à-vis 109% in the previous year.

Both Kochi and Mumbai Refineries registered their highest ever throughput in this financial year. The crude processing of Bina Refinery was impacted when cyclonic storm 'Biparjoy' stopped operation of the Crude Oil Terminal (COT) and Vadinar Bina Pipeline (VBPL) due to power interruption. Agile and dynamic refinery team along with pipeline team restored the power in record tine without significant upset in refinery operation. This performance, along with industry leading percentage distillate yields, strengthened the Company's position as a reliable and capable supplier of transportation fuel in a demanding and competitive industry. It is pertinent to note that whilst we made significant achievements this year, staying true to our motto 'Safety First Safety Must', all three refineries clocked nil LTA (Lost Time Accident) for employees and contract workers in FY 2023-24 despite two major turnarounds of Bina and Mumbai Refineries.

BPCL refineries also recorded the highest Gross Refinery Margin (GRM) amongst PSU OMCs in the FY 2023-24. The key to such performance has been the right selection of crude oil. New crudes were added to crude baskets of refineries thus ushering in more flexibility. Each refineries added at least 3 new crudes to their respective basket in this financial year. The dedicated crude selection and procurement wing of BPCL along with Subject Matter Experts (SME) of Refinery crude planning and processing enabled us to choose the right recipe of challenging but discounted crudes in the crude basket. This crucial activity facilitated much needed reduction in feed costs.

Processing these crude recipes consistently throughout the year was equally challenging. Subject matter experts from refineries made dynamic changes in operating parameters to process these special crude varieties supported ably by risk-based inspection practices at critical areas. Digitalization , innovation and reliability initiatives were given due focus for sustenance of performance excellence. This Data-driven decision-making, leveraging digital solutions and a culture of risk preparedness enabled the refineries to deliver the stellar performance in this financial year.

Bina Petchem and Refinery Expansion Project (BPREP) has been conceived to expand our refining and petrochemical production capabilities. The project envisages setting up of a modern petrochemical complex at BR, to tap into the synergies of integrating refinery and petrochemical operations and to increase the petrochemical intensity index of BR to 20%. Additionally, the capacity of BR would be enhanced to 11 MMTPA from the current capacity of 7.8 MMPTA, and it would produce around 2.2 MMTPA petrochemical products.

The major units proposed to be set up in the petrochemical complex are the Ethylene Cracker and Associated Units (ECU Block) of 1,200 Kilo Tonnes per Annum (KTPA) capacity, Linear Low Density Polyethylene (LLDPE)/ High Density Polyethylene (HDPE) units with a total of 1,150 KTPA Polypropylene Unit (PP) of capacity 550 KTPA and Butene-1 Unit (BU) of capacity 50 KTPA. The major units proposed to be set up in the refinery expansion are the Crude Distillation Unit of 4,000 KTPA capacity, Bitumen Unit of 300 KTPA capacity and revamp of the existing Hydrocracker Unit from 2.6 MMTPA to 3.55 MMTPA. The project scope also includes capacity augmentation of the Crude Oil Terminal at Vadinar and the Vadinar Bina Pipeline. The project is scheduled for completion in 2028.

The Lube Oil unit at Mumbai Refinery has been revamped to enhance its production of industrial solvents. The De-Aromatic Solvent (DAS) Project, which is expected to be commissioned by FY 2025-26 intends to meet the increasing demand of DAS products, by setting up an independent train of the DAS Unit with 200 KTPA (Kilo Tonnes per Annum) capacity. The Unit will produce DAS products (D40, D60, D80, D110, D130) and White Oil products [MAK Base Lite (MBL), Heavy Liquid Paraffin Oil (HLPO) & Light Liquid Paraffin Oil (LLPO)] on a continuous basis, along with lube oil production capacity of 450 TMTPA. These products are special grade industrial solvents used in applications like paints, metal rolling, mosquito repellents etc. BPCL is looking forward to enhancing the name plate capacity of Mumbai Refinery from 12 MMTPA to 16 MMTPA and Kochi Refinery from 15.5 MMTPA to 18 MMTPA in the next five years through revamps. The initial project studies for this augmentation are currently in progress.

After the successful integration of Niche petrochemicals of 329 KTPA through the Propylene Derivatives Petrochemical Project (PDPP) at Kochi Refinery, refinery commenced project work for integration of bulk petrochemicals at Kochi through the Polypropylene (PP) unit. Kochi Refinery has the capability to produce additional Propylene feedstock after catering to the requirement in the PDPP Unit. With minor modification of the existing Petro Fluid Catalytic Cracker (PFCC) Unit, Propylene feedstock can be further enhanced. This gives an attractive opportunity for setting up a PP unit at Kochi Refinery for producing Homo grade Polypropylene, thereby enhancing the petrochemical portfolio of BPCL. The capacity of the proposed PP unit has been considered as 400 KTPA, based on the production and utilization of Propylene and market demand.

Digitization continued to play a pivotal role across all the refinery operations. Ranging from selection and processing of crude to dispatch of products, digital tools were leveraged for deriving optimal solutions. We successfully utilized next-generation technologies like Machine Learning (ML), Artificial Intelligence (AI), Robotic Process Automation (RPA) and Advanced Process Control (APC) models. These technologies, alongside new applications and infrastructure upgrades, were carried out for optimizing refinery operations, including predictive maintenance-cum-failure detection, process optimization, cost reduction, enhancing energy efficiency, increasing productivity and improving safety, in all three refineries. Added thrust was given to development of digital solutions for frequently encountered situations in refineries. An in-house tool, Government e Marketplace (GeM) Portal RPA Bot was used successfully for procurements, the Central Procurement Office (CPO) streamlining critical processes, thereby enabling quick extraction of data, automation of manual tasks and enhancement of productivity. Similarly, an in-house tool developed for Turnaround Progress Monitoring was deployed for monitoring short shutdowns across refineries. The Corrosion Control Teams (CCT) Application was also developed in-house and extended to all three refineries for live monitoring of corrosion probability in process lines. The increased efficiency, enhanced safety and improved environmental performance achieved through digitalization, will ensure our long-term sustainability and growth. We are confident that our commitment to digitalization will continue to deliver significant value for our stakeholders for years to come.

BPCL is slated to be a Net Zero Company for Scope 1 and Scope 2 emissions by 2040. Enhancing energy efficiency is one of the major levers for achieving the net-zero targets. The Company made major strides in energy conservation and emission reduction during the year, adopting a multi-pronged approach for prioritizing energy efficiency across its refineries. This included process optimization, advanced control systems, energy recovery initiatives, equipment upgrades and integration of renewable energy sources. These strategies not only led to significant energy savings, but also minimized environmental impact and contributed to sustainable development. Importantly, BPCL achieved these goals while maintaining cost-effective operations. Focus was given to electrification and building flexibility for shifting towards cleaner fuels in line with the Net Zero goals. Studies were conducted for switching from liquid fuel to gaseous fuel in furnaces and boilers. Renowned consultants were identified for energy conservation and emission reduction opportunities across the refineries. Low hanging fruits from these studies are being implemented and engineering studies for mid-term and long-term initiatives are being planned.

In FY 2023-24, the refineries implemented energy reduction initiatives, saving 1,04,875 Metric Tonnes of Oil Equivalent (MTOE) per annum with potential CO_2 emission reduction of 3.4 lakh tonne/per annum. Initiatives such as the micro-turbine installation in the SRU let-down steam, heater revamp with efficiency improvement, electrical heat tracing, improving condensate recovery, flash steam recovery, heat improvement with additional exchanger, APC of the de-aerator, steam saving initiatives like sour water reduction by rerouting to other process units, stripper reboiler steam reduction by process integration, etc. were instrumental in achieving energy reduction targets. Further details of energy reduction initiatives are listed in Annexure A.

Every refinery ensured rigorous environmental compliance while enhancing their environmental performance. BPCL refineries are dedicated to continuous improvement, working towards a future where our industry shall thrive alongside a healthy planet. We are constantly seeking ways to reduce our water consumption and treat wastewater to the highest standards before returning it to the environment. In the last financial year, BPCL has taken measures to enhance rainwater harvesting and cumulatively harvested 6 lakh Kilo Liters (KLs) of rainwater. Mumbai Refinery reduced 22 lakh KL of fresh water consumption by processing water from sewage treatment plant. We understand the vital role that healthy forests play in capturing carbon dioxide and mitigating the effects of climate change and are committed to supporting tree planting initiatives. In the last financial year, more than 7,500 plants have been planted by the Refineries. In addition, an MoU has been signed with the MP Forest Department for 1 lakh plantation in 90 Hectares (ha) of forest land.

BPCL Refineries acknowledge the significance of transitioning towards a clean energy future. We are actively exploring ways to integrate renewable energy sources into our operations and are investing in research and development of cleaner fuels. We are also exploring Compressed Bio-Gas (CBG) as another alternative fuel using municipal solid waste with support from local administration. The Biogas generated is planned to be utilized for production of Green Hydrogen. Our efforts in setting up of solar power plants and a bio-methanation plant are fully described in the Directors' Report.

RETAIL

The fiscal year 2023-24 has been a period of strategic transformation and robust growth for the Indian economy, with a continued resurgence across various sectors and further stabilization after the pandemic-induced disruptions. During the year, India's economic narrative of robust recovery and growth was sustained by strong domestic demand, strategic policy interventions and a resilient industrial sector. India's GDP growth rate in 2023-24 reflected a strong economic rebound.

Strong economic growth during the year resulted in increased consumption of petroleum products, reflecting an increased demand in transportation fuels and industrial applications. This growth has been supported by the Government's infrastructural investments and the revival of the manufacturing sector. The retail fuel industry grew by 1.6% on a higher base during FY 2023-24, while the PSU Oil Marketing Companies (OMCs) registered a de-growth of 2.0%. The degrowth was on account of shifting back of volumes that had come to the PSU OMCs in FY 2022-23, due to pricing conditions and restricted operations of the Private Oil Companies (POCs) during the year. In 2023-24, the above volumes shifted back to industrial customers and the POCs. BPCL's retail business segment achieved growth of 1.1%, clocking volumes of 32.69 million Metric Tonnes (MMT) during FY 2023-24. Against this, PSU OMCs registered a negative growth of 2.0% during FY 2023-24. Motor Spirit (MS) i.e. Petrol recorded 5.4% growth, registering sales of 10.09 MMT during FY 2023-24, as compared to 9.58 MMT during FY 2022-23. In the MS retail business, the Company consistently performed well and registered a growth in market share every year since FY 2018-19. BPCL's MS retail market share grew the highest among the PSU OMCs, by 1.03% in the last five years. The Company's market share in the MS retail business increased by 0.22% during FY 2023-24 and reached 29.68% among OMCs.

Diesel sales registered a negative growth of 1.6%, with a sale of 21.58 MMT, as compared to 21.93 MMT sold during the last year. The OMCs registered a degrowth of 5.5% in Diesel sales. BPCL's market share in the High Speed Diesel (HSD) retail business increased by 1.19% during the year and reached 29.83% among the OMCs. The Company is aggressively capturing market share in the alternate fuel segment at retail outlets (ROs). During FY 2023-24, BPCL increased its market share of Compressed Natural Gas (CNG) within the OMCs by 1.54%, clocking volumes of 980 Thousand Metric Tons (TMT), attaining market share of 30.57%.

BPCL commissioned the Bokaro Depot in Jharkhand to strengthen supply to the eastern regions of the country in a safe and secure manner. In the southern region, full-fledged operations at Krishnapatnam Coastal Installation (Andhra Pradesh) and Kalaburagi Depot (Karnataka) were commenced. In line with the Government's Ethanol Blending Program (EBP) aimed at achieving multiple outcomes, such as addressing environmental concerns, reducing import dependency and providing a boost to the agriculture sector, BPCL augmented Ethanol tankage capacity from 112 Thousand Kilo Litres (TKL) to 135 TKL during the year. The Company has achieved the highest ever Ethanol blending of 11.70% during FY 2023-24, as against 10.60% achieved during FY 2022-23. BPCL also achieved Biodiesel blending of 0.36% during the year. E20 (Ethanol Blended Petrol with 20% Ethanol) is made available to customers at more than 4,000 ROs during the year.

The Company took positive steps towards creating environments that welcome and embrace individuals from all walks of life, ensuring that everyone has equal access to opportunities and resources. In a breakthrough initiative, BPCL launched #SilentVoices on August 15, 2023 to promote inclusivity and implemented the same at more than 120 ROs across the country covering over 25 cities. Under the #SilentVoices initiative, 150 Speech & Hearing Impaired (SHI) individuals are employed by dealers at ROs. This is just a beginning - the Company aims to proliferate it to a greater number of ROs in the upcoming years.

BPCL has expanded its retail outlet network to 21,840 ROs with the addition of 809 New Retail Outlets (NROs) during FY 2023-24. The Company further strengthened its presence in the highly strategic markets and highways, by commissioning an all-time highest record of 18 Company Owned Company Operated (COCO) Outlets, including a GHAR outlet during the year, taking the tally to 348 COCO outlets. Our signature brand of GHAR - One Stop Trucker Shops (OSTSs) - are strategically located on major highways to provide transporters and drivers 'a home away from home' experience. BPCL is also participating in National Highway Authority of India's (NHAI) Way Side Amenities (WSA) plan. WSA will have resting facilities such as parking, dormitory, dhaba, etc. for drivers, along with fuel services at the retail outlet, to reduce fatigue of long-distance travel along the National Highways and National Expressways. The Company has successfully won bids for 18 WSAs and three WSAs have been commissioned during FY 2023-24, two on the Delhi-Mumbai Expressway stretch in Gujarat and one in Asam on NH-27 (part of the North-South-East-West corridor).

To capitalize on growth opportunities in newer geographical areas and along upcoming expressway stretches, BPCL plans to commission 4,000 NROs in the next five years. Along with conventional fuels, the Company has ensured the availability of alternate fuels like CNG at its ROs across geographies, with mechanical completion of 435 CNG stations and commissioning of 278 CNG stations during the year. With this, the CNG stations are now operational at 2,031 ROs across the country.

In an era where customer interactions have transcended traditional boundaries, the Company stands at the forefront of redefining fuel retailing. BPCL's innovative customer engagement services not only enhance consumer experiences, but also cement its position as a leader in the energy sector. 'UFill', the first of its kind in the industry, was a unique customer service initiative which delivers on BPCL's promise of ensuring that our customers have complete control over time, technology and transparency as part of their fueling experience. After successfully proliferating UFill to more than 11,000 ROs, with a customer base of 2.5 crore and facilitating 35 million transactions during FY 2023-24, BPCL has further taken steps to improve convenience and transactional transparency by introducing an enhanced version of Ufill during the year. The customer is now able to preset the dispensing unit at the RO through the mobile, taking complete charge of the fueling, enhancing trust in the Company.

With the objective of ensuring enhanced customer experience, BPCL is investing in channel partners and strengthening their capabilities. Accordingly, the Company launched 'Project Utkarsh' during FY 2023-24, a capability building initiative for dealers. Customized content, covering various aspects, has been developed for the structured training programs, which will empower dealers to adapt to the changing market demands, leverage opportunities and achieve their full potential. This program is being delivered through tie-ups with premier management institutes across the country. A significant number of dealers were covered during the year and the initiative will be continued in FY 2024-25 as well. The Company has also taken steps to build the capability of its frontline soldiers - DSMs (Driveway Salesmen) - under 'Project Sangam'. The objective is to equip the DSMs with behavioral and functional inputs, so that they provide enhanced customer service at the forecourt. The capability building efforts are through a hybrid approach of providing classroom training and use of the mobile app. During FY 2023-24, pilot workshops were done and the full-scale roll-out is planned during FY 2024-25.

In yet another innovative customer centric initiative, the Company has launched 'BeCafe' – Brewing Journeys pace-at its ROs. At BeCafe, BPCL endeavors to provide state-of-the-art cafe experience with world class products, ensuring value for money price ranges. BPCL commissioned 6 BeCafes during FY 2023-24, beginning a new chapter in the history of the Company.

Keeping in mind the convenience of customers with stationary equipment like generators, heavy machinery, mobile towers, construction equipment, etc., 49 'FuelKarts' were commissioned under BPCL's Door-to-Door Delivery of Diesel (DDD) initiative. This unique service model meets customer requirement efficiently through pilfer-proof technology. With this, the total number of these mobile fuel bowsers has increased to 768. Additionally, 48 'FuelEnts' (Fuel Entrepreneur start-ups) were commissioned during the year, taking the total number of mobile dispensers run by FuelEnts to 313. BPCL's 'MAK Quik' initiative for two-wheeler customers, which provides quick oil change service at ROs through an oil change machine, has been extended to 7,500 ROs during FY 2023-24. For the convenience of new age truckers (BS-VI vehicles) especially on highways, the Company has introduced Diesel Exhaust Fluid (DEF) dispensers at 487 ROs during the year, taking the DEF dispenser network to 745.

The Company enhances every customer visit with a spectrum of value-added services at its retail outlets, which underscore BPCL's commitment to convenience and a superior customer experience. These services are designed to cater to the dynamic needs of our diverse customer segments from rural, urban and highway, differentiating the Company from competitors. BPCL has continued collaboration with M/s. Fino Payment Services to provide comprehensive banking services to our esteemed customers, which include Aadhaar Enabled Payment System (AePS), Micro ATMs, Domestic Money Transfer, Cash Management System (CMS) and Government to Citizen (G2C) services. The Company has achieved Gross Merchandise Value (GMV) of ₹ 4,013 crore during the year, a testimony to our customer-centric focus. BPCL-SBI Card, India's fastest growing co-branded credit card, has reached a 33 lakh customer base and cardholders have redeemed 18.73 million litres of free fuel at our fuel stations during the year.

BPCL is a pioneer in its loyalty program among the OMCs, with the brand, 'SmartFleet', which is serving 1.5 lakhs satisfied transporters. Further, an Advanced Loyalty Program (ALP), coupled with Application Program Interface (API) integration with the IT systems of Fleet customers as a value-added service, has reached more than 100 high-end customers, ensuring their loyalty stays with us forever. Demonstrating our commitment to the welfare of those who help keep our operations moving forward, the Company helped 61 families of drivers/helpers with insurance disbursement of ₹2.93 crore during FY 2023-24. BPCL is committed to helping the drivers/helpers and their families.

Embracing innovation in its product offerings, BPCL launched the new avatar of 'Speed' - a premium petrol engineered for superior performance. This reinvigorated version of Speed represents our commitment to providing advanced fuel solutions that enhance the driving experience and engine life. In a first amongst the OMCs, the new avatar of Speed works on Port Fuel Injection (PFI) engines as well as the latest technology Gasoline Direct Injection (GDI) engines. It also has friction modifiers, which further help in increasing engine life as well as fuel economy. The Company has also partnered with Olympic and World Javelin Champion, Mr. Neeraj Chopra as its vibrant Brand Ambassador for Speed.

As India strides towards a sustainable future, the Company is proud to lead the change in the Electric Vehicle (EV) revolution. With the second largest network of EV fast charging stations across national highways, BPCL is not just facilitating a smoother transition to green mobility, but also setting new benchmarks in infrastructure and accessibility. Highway Fast Charging Corridors is an innovative concept the Company introduced during FY 2022-23, where EV fast chargers were installed on strategic highways with distances of 100 kms from each other, to address the range anxiety of EV users. Taking forward the concept to proliferate on more highways, BPCL has expanded its EV fast charging network to 894 stations, majorly on 120 highway corridors. During FY 2023-24, the Company also added 40 EV fast charging stations for two-wheelers, in alliance with major OEMs like Ola, Ather and Hero, taking the network to 106. BPCL commissioned 2,443 EV charging stations during FY 2023-24, taking the total to 3,135, along with battery swapping stations. Plans are afoot to expand its EV network to 7,000 stations in the near future.

BPCL had signed an MOU with Tata Motors to share insights which will help us in deciding on locations to set up EV charging stations. As Tata Motors has rich experience and data on EV vehicles, this tie-up is going to prove vital to the Company's ambitious plans in the EV segment. BPCL also signed an agreement with Trinity Cleantech for setting up three-wheeler fast chargers in UP, which will further improve our stakes in this segment.

The Company consistently leads the way in integrating cutting-edge technology into fuel retailing, setting industry standards and enhancing customer experience at every touchpoint. Our technological initiatives are geared towards making fuel purchases, not only more efficient, but also more engaging. BPCL's 19,950 ROs are fully automated, where every fuel transaction happening at the forecourt, along with inventory, is captured in its server. An Integrated Payment System (IPS) ensures that the customer pays for the exact amount of fueling and all payment solutions are available in a single Point of Sale (POS) machine at the forecourt.

Pre-authorization functionality has been developed and rolled out at all retail outlets, ensuring trust, transparency and convenience. Pre-authorization is available in loyalty payment solutions and UFill enables the customer to preset the fuel dispenser for any intended fuel value by making digital payment through any UPI app. BPCL's automation system, integrated with IRIS (an AI-driven Digital Nerve Center) is interconnected through intelligent systems, helps in analyzing and monitoring the health status of equipment and connectivity status at the RO, ensuring all defined standard operating practices are followed. The Automation System provides an edge for the Company to manage various retailing initiatives.

In a first-of-its-kind initiative in the industry, BPCL has implemented management of Vehicle Tracking System (VTS) violations by real-time tracking of 100% tank lorries through IRIS. Retail Auto Invoicing System (RAIS 2.0), which has completely automated end-to-end process of product supplies through tank lorries and customer indent execution, went live at Sewree Installation. The Company plans to roll out RAIS 2.0 at all locations during FY 2024-25.

In its commitment to enhance safety at Retail Operating Locations, BPCL has implemented several initiatives aimed at fostering a robust safety culture. These initiatives include adopting the best practices for safety, increasing awareness and providing comprehensive safety training. Key among these efforts are simulated fire drills conducted at all our depots and installations, ensuring preparedness and responsiveness to any emergency.

BPCL is dedicated to fulfilling its commitments towards a green environment. All our Retail Operating Locations are Zero Waste to Landfill (ZWL) certified. As a conscious corporate citizen, BPCL implemented a ban on single-use plastic at all its locations. To reduce power consumption, all conventional lights at our locations have been replaced with energy-efficient Light Emitting Diode (LED) lights. Considering the safety of people and the planet, BPCL has eliminated the use of asbestos from all its locations. The Company strictly follows the directives of the Central Pollution Control Board (CPCB) and National Green Tribunal (NGT), and accordingly, implemented the Vapour Recovery System (VRS) at 1,858 ROs and 13 Retail Operating Locations to reduce emissions.

Overall, BPCL's Retail business maintained its leading position in the industry, exemplifying trust, convenience and personalization. Our efficient operations and digital solutions enhance customer convenience and generate significant value for all stakeholders.

Biofuels

In line with the Government's Ethanol Blended Petrol (EBP) program, BPCL achieved the highest-ever Ethanol blending percentage of 11.7% (consuming 166.4 crore litres of Ethanol) this year, up from 10.6% in the previous year and aims at exceeding 14% in 2024-25. BPCL has also positioned E20 (MS with 20% Ethanol blending) at its ROs and has so far reached 4,279 ROs.

The Company has been blending 1G Ethanol produced from molasses, sugarcane, damaged foodgrains and surplus rice in petrol across all its locations pan-India. It has also augmented Ethanol storage capacity at its supply locations, from 112 TKL to 135 TKL in the last financial year. BPCL has ensured Ethanol availability across the length and breadth of the country by carrying out movement of EBMS as well as Ethanol by rail to deficit locations.

BPCL is the Industry Coordinator for Ethanol procurement and is spearheading the EBP Program by procuring 1G Ethanol from multiple sources. The Company's integrated 1G/2G Bio-ethanol refinery at Bargarh, Odisha, of a combined production capacity of 200 KL per day, is under construction and expected to be commissioned in FY 2024-25. The Company's focus on Biodiesel has gained momentum with procurement of 102.6 TKL (8.21 TKL in the last financial year) of Biodiesel in the year 2023-24 and sales of 1,390 TKL Biodiesel-blended Diesel (116 TKL sold in the previous year), thereby achieving a blending of 0.36% (0.03% last year).

BPCL has also taken initiatives in the field of production of Compressed Bio-Gas (CBG) from biomass waste/biomass sources like agricultural residues, sugarcane press mud, Municipal solid waste, etc. and issued 382 Letters of Intent (LOIs) for a total estimated production capacity of about 7 lakh Tonnes Per Annum (TPA) of CBG. During the year, six CBG plants were commissioned by BPCL LOI holders. The Company added nine more ROs for CBG retailing, increasing the number of outlets to 50 with cumulative sales of 6.5 TMT.

BPCL has initiated setting up its own CBG plants and has obtained in-principle sanction from the Government of Kerala for setting up a 150 TPD CBG plant at Kochi based on segregated Municipal Solid Waste.

INDUSTRIAL AND COMMERCIAL (I&C)

The Industrial & Commercial Strategic Business Unit (I&C SBU) serves as the marketing division of the Company dedicated to the Business to Business (B2B) segment. The SBU continued to steadfastly uphold its commitment to enhancing customer satisfaction through innovative solutions, value-driven business relationships and a focused customer orientation. This approach helped it to excel during yet another year marked by complex business dynamics and significant opportunities.

The market intelligence and strategy implementation continuously evolved, driven by a profound understanding of customer preferences and a thorough analysis of the competitive landscape. Particularly in the Petrochemical segment, the global market's influence on domestic conditions heightened the importance of acquiring real-time data on global production and demand. The I&C team remained responsive to these global shifts, effectively penetrating markets traditionally dependent on imports, though its dynamic pricing strategies.

Furthermore, central to the SBU's operations and efforts to excel, were the ongoing development of the field force's functional skills and the strategic use of technology to ensure trust, convenience and personalization. These initiatives were crucial in delivering an enhanced customer experience and in achieving optimal value and volume, despite the challenges encountered during the period.

The strategic introduction of new products was met with robust market reception, reflecting the capability to innovate and meet evolving market needs. The I&C SBU's commitment to quality and service excellence was acknowledged by customers.

The novel approach, in sourcing beyond the refinery and innovative solutions in optimizing logistics with robust technical support, has led to increased customer satisfaction and confidence, reflecting in the increased volumes.

This year, the I&C SBU has not only continued its legacy of excellence, but has also pioneered numerous industry firsts, underscoring our unwavering commitment to innovation and customer satisfaction. During this fiscal year, the I&C SBU achieved record-breaking sales, surpassing 7 MMT in volume, with market share of 22.86%, an all-time high that significantly enhances our market presence. The highest sales were achieved in HSD with major inroads made in the Defence, State Transport, Railways, Mining and Infrastructure sectors.

The team took strategic pricing decisions in the Petrochemicals domain, resulting in change of status from 'market followers' to 'market drivers'. Being vigilant to international price movements and being nimble-footed helped garner the highest ever volume of 234 TMT.

Pursuing the strategy of beyond refinery sourcing, the SBU registered a sale of 61 TMT of Bitumen through third party sourcing and imports, thus enhancing the geographical reach in key growth markets. With customized offerings, I&C also achieved the highest ever sales of Hexane and Naphtha.

Bunkering remained a strong focus area and with efficient product placement and smart business deals, VLSFO (Very Low Sulphur Fuel Oil) sale of 272 TMT was registered during the year at the 3 port locations of Kochi, Mumbai and Kandla.

I&C has persistently advanced its efforts in promoting the innovative 'Smokeless SKO' for the Indian Army, commencing supplies from Bina Refinery. This initiative has significantly extended our reach to the far north and northeast regions. Throughout the year, I&C has successfully commissioned state-of-the-art scattered tankage facilities for the Indian Army at Mudh and in the Kashmir Valley. Additionally, two advanced fuel bowsers were delivered to the Indian Army, ensuring uninterrupted operations at these strategic locations.

In co-ordination with the Refineries, the SBU obtained Registration Evaluation Authorization and Restriction of Chemicals (REACH) compliance certification of Dearomatized Solvents, which will enable it to market the product to international markets.

In pursuit of continuously enhancing the competencies of the field staff to deliver superior value, extensive training sessions were conducted, focused on product knowledge, pricing and commercial acumen.

I&C has steadfastly progressed in its digital transformation journey with 'Project Anubhav', implementing numerous measures to facilitate the seamless deployment of the feature-rich customer engagement portal - HelloBPCL - to enrich customer experience and improve overall internal efficiency, enabling superior service delivery to our customers.

Through seminars and workshops, structured engagement with customers and other stakeholders was ensured for a variety of business segments, including manufacturing, infrastructure, pharma and food.

Continuing the legacy of excellent performance, the I&C BU is committed to sustaining its momentum with strategies in place to circumvent challenges during this pivotal period of the country's growth.

GAS

The Gas SBU of the Company is working towards India's transition to a Gas-based economy. With its tagline of #The Good Print on social media, the Gas SBU has devised safe and innovative solutions in the above endeavor. To enhance value for all its stakeholders, the business has further upscaled and streamlined its operations, especially in City Gas Distribution (CGD), for long-term sustainable growth. BPCL continues its journey to strengthen its position by developing the ecosystem across the gas value chain, right from sourcing to the end consumer. On the supply side, the Company is focusing on securing long-term supply, import infrastructure, regassification capacities; on the demand side, the focus is on gas transport agreements in major pipelines and establishing and expanding CGD networks to meet the gas demands of domestic, retail, commercial and industrial customers.

With the capacity to infuse capex and faster strategic decision-making, BPCL always endeavors to nurture long lasting relationships in the entire life cycle of customers, vendors, contractors and all stakeholders in the gas value chain.

During the year, the business ensured optimum sourcing through a combination of long-term contracts, spot purchases, domestic gas purchase through bidding in e-auctions and RLNG tenders and trading on the Indian Gas Exchange (IGX). The sourcing portfolio is strategically managed to mitigate the risk in a highly volatile gas price market. The strategic mix of sourcing portfolio helped the Company to optimize purchase cost for maximizing profitability. During the year 2023-24, BPCL has sourced an equivalent of 22 cargoes under long-term contracts, 6 TMT through the e-bidding platform, 6 TMT from RLNG tenders and 84 TMT from IGX.

During 2023-24, the Company has supplied 1,857 TMT of Gas to its esteemed customers, spread across various segments including the refineries. Out of the total sales, 966 TMT was supplied to various customers in Fertilizers, Power, Petrochemicals, Steel and other industries. A total of 726 TMT was supplied to the refineries-312 TMT to Mumbai Refinery and 414 TMT to Kochi Refinery. CGD network sales contributed 83 TMT, doubling last year's sales of 41 TMT.

To support India's 'Green Vision', BPCL has made capex investment of ₹ 1,920 crore during FY 2023-24 to enhance its operations for faster expansion of the CGD network and plans to invest another ₹ 2,500 crore in FY 2024-25.

The Company achieved another milestone in 12 and 12A CGD bidding rounds of Petroleum and Natural Gas Regulatory Board (PNGRB), by securing 17 districts of Jammu & Kashmir including Leh-Ladakh. BPCL and Oil India Limited (OIL) in consortium secured 28 districts of Arunachal Pradesh state in the 12th CGD bidding round of PNGRB. With a significant presence in various geographies across the country, BPCL is a key player in the CGD business.

The Company has owned authorization for 26 Geographical Areas (GAs) on a standalone basis, to develop the CGD network; out of this, 25 GAs, that cover 64 districts, secured till 11 and 11A CGD bidding rounds of PNGRB, have been commissioned. The GAs secured in 12 and 12A bidding rounds of PNGRB are slated for commissioning in the next financial year. BPCL, together with its Joint Venture Companies (JVCs), have secured authorization for 52 GAs that cover 154 districts.

The Company has mechanically commissioned 671 CNG stations, out of which 440 CNG stations are operational, meeting customer demand; the balance will be made operational soon. 150 CNG stations are planned for construction in FY 2024-25. The record high of 1.87 lakh PNG domestic connections have been added during FY 2023-24, making it a total of 3.31 lakh PNG domestic connections. BPCL has laid a 2,348 inch-Km steel pipeline as on March 31, 2024, to expand its reach in the CGD network.

The mass awareness for gas proliferation to target consumers was conducted through an aggressive campaign, 'Aage Badho PNG Chuno', during FY 2023-24. BPCL bagged two awards from PNGRB for this campaign, under the category of number of registrations and households contacted. Under the campaign, there were 2,53,341 PNG domestic connection registrations, 5,02,446 households contacted and 49,598 cases of 'last mile connectivity' completed during FY 2023-24.

The Company's commitment to transforming its energy mix and positioning itself as a future ready energy company, capable of meeting evolving demands for cleaner and more sustainable and innovative energy solutions, has ensured uninterrupted supplies of gas to all its customers, despite a highly volatile market and penetration to newer geographical areas.

LUBRICANTS

As per the Petroleum Planning & Analysis Cell (PPAC), the Indian Lubricant market has grown to 4,076 TMT, with growth of 9% in FY 2023-24. In this period, MAK Lubricants registered the highest ever volume of 446 TMT, with a growth of 16%.

In pursuit of heightened brand visibility, the MAK Brand has electrified all media platforms. Collaborations with Shah Rukh Khan's movie, 'Jawan' and cricket icon, Rahul Dravid joining the MAK family as its Brand Ambassador, the media campaign during the World Cup, has entrenched the brand in the minds of the audience.

Propelling towards the future, the Lubes SBU is committed to innovation and meeting market demands. Introduction of 19 new grades, including pioneering products like 'MAK ADJOL BANANA and MAK ADJOL TEA, adjuvant oils providing revolutionary organic and biodegradable pest management solutions for banana and tea respectively, and MAK SMART KOOL, coolant for computer servers, underscore the SBU's dedication to excellence. Also, the new product range of Synthetic Lubricants for the car segment, which is Ethanol20 compliant was introduced. With the success of MAK Drillol, under the Atmanirbhar Bharat Abhiyaan, for drilling operations in oil exploration, MAK Drillol LV is now ready for deep sea drilling.

With the Company's extensive network of retail outlets, the connect with customers continued to improve through campaigns at the forecourt. MAK Lubricants broadened its secondary network of Retailers and Mechanics through the digital interface, 'HelloBPCL'. In addition, the SBU onboarded 37 new distributors, bolstering our market presence. Furthermore, a strategic re-entry into Sri Lanka and strides into the African continent (Kenya, Uganda and Tanzania) marked a successful foray into international markets. Strategic collaborations have been instrumental in moving beyond business to areas of development and collaboration with the SBU's prestigious customers, Kirloskar Oil Engines and TVS Motor Company.

MAK Lubricants' digital endeavors have been transformative. Unveiling of MAKonnect, an integrated secondary sales management platform for distributors, retailers and DSRs, has revolutionized the network by providing business insight for informed decision-making and streamlining operations. Moreover, the MAK QR Code presents an integrated supply chain solution, enabling SKU tracking and disbursing rewards for end customers.

With sustainability as core to its business principles, the SBU is ready with innovative packaging solutions like recycled plastic containers, bamboo packages and tin cans. At MAK Lubricants, continuous improvement is ingrained in our ethos. It is a matter of great pride that BPCL Marketing Quality Assurance has been accredited as a certification and inspection body by National Accreditation Board for Certification Bodies (NABCR).

As we forge ahead towards the future, MAK Lubricants remains steadfast in its commitment to innovation, sustainability and customer satisfaction.

LPG

During FY 2023-24, LPG demand witnessed a notable surge with industry growth of 3.5%. This was driven by reduced prices, enhanced subsidy for Pradhan Mantri Ujjwala Yojana (PMUY) customers, Government initiatives, free refill schemes, promotion of clean energy and rural penetration. With added impetus on customer-centric initiatives to promote safety at customer premises and enhance customer experience, the LPG SBU not only ensured sustained growth, but also improved its margins.

The business registered its highest-ever packed LPG sales of 7,928 TMT for the year, attaining growth of 3.37% and secured the second highest packed LPG sales growth in the industry. With the objective of ensuring promotion of clean fuels and to increase the proliferation of LPG further, another 18.54 lakh customers were enrolled under Ujjwala 2.0, taking the total BPCL customer base under the PMUY scheme to 2.68 crore since the inception of the scheme in the year 2016-17. New customer enrolment of 28.64 lakh during the year took BPCL's domestic LPG customer base to 9.35 crore at the end of the year.

To ensure uninterrupted availability of cooking fuel at home, the Company encouraged customers to opt for Double Bottle Connections (DBCs) and upgraded 9.26 lakh customers to DBCs. To ensure that Bharatgas is available at places closer to customers, the business unit added 37 new distributorships during the year, taking the total to 6,252 distributors as on March 31, 2024. Further, 66 non-domestic distributors were added by the company to increase the commercial LPG footprint. BPCL added 1,869 village level women entrepreneurs, called 'Urja Devis', to boost the Company's efforts for rural outreach and improve awareness/ accessibility of LPG in rural areas. These entrepreneurs actively promote clean cooking fuel, educate customers on safety measures and advocate for non-fuel offerings in rural regions. To address the affordability issue of the low-income segment of consumers, we are piloting financial assistance in the state of Madhya Pradesh through the State Rural Livelihood Mission (SLRM).

LPG business has signed a 15-year agreement with GAIL to supply 600 TMTPA of Propane valued at ₹ 63,000 crore from its LPG import facility at Uran. This reaffirms the Company's business commitment to meet the growing needs of the Indian Petrochemical Industry.

As a step towards addressing last mile delivery inefficiencies in LPG, 'Pure for Sure' initiative was launched by Hon'ble Minister of MoP&NG at India Energy Week (IEW) in Goa in February 2024. Tamper-proof seals with QR codes were developed for authentication to ensure availability of the complete trail of the cylinder from the plant to the customer. This would address issues like pilferage/underweight, diversion of refills and overcharging faced in the LPG delivery ecosystem.

The LPG business worked on three pillars of growth, viz. Safety, Trust and Convenience. Towards our safety commitment, many initiatives were launched like 'Zero Ka Dum' (the quality challenge which guarantees that all LPG cylinders in the market are entirely free from defects, improving trust and enhancing process efficiencies), a safety campaign, AI chatbot-enabled IVR calling to customer for self-check inspection of their LPG equipment in the kitchen, etc. To enhance safety awareness among stakeholders throughout the value chain, Bharatgas Safety Day is observed on the 21st day of each month. This initiative, started in FY 2022-23, is being continued this year as well. Our Distributors conducted 96,230 safety clinics in FY 2023-24.

The LPG SBU has effectively implemented the 'Viksit Bharat Sankalp Yatra' as part of the Government-driven initiatives. This nationwide campaign was slated to raise awareness and achieve saturation of schemes of the Government of India (GOI) in identified geographies. Through extensive outreach activities, the campaign targeted customers in far-flung areas and enrolled potential beneficiaries under the PMUY. A total of 2.47 lakh events were successfully conducted by OMCs under this initiative. Another GOI initiative, a free Safety Campaign was launched across the country for quick safety inspection at customer premises with a discounted price for Suraksha hose replacement.

In our continuous efforts to strengthen consumer retailing, the LPG business commissioned 30 'In & Out' convenience stores at LPG distributorships during the year, taking the cumulative number to 53.

LPG bottling achieved the highest ever bottling volume of 7,939 TMT, recording a growth of 3.1% with capacity utilization of 100%. LPG bottling plants continued to maintain the best practices in Health, Safety, Security and Environment (HSSE), while maintaining cost leadership. Towards our commitment to technology, we have piloted automation of the entire LPG bottling operations in the Bengaluru LPG plant. Marking a significant step towards automation within the Company, 25 LPG bottling plants have successfully integrated the tank farm management system and SAP. During the year, Operations & Maintenance (O&M) services and outsourcing of plant operations and maintenance to a third party were started at three more LPG plants (Chennai, Tuticorin and Kurnool), bringing the total to 13 LPG plants operating on O&M services.

Augmentation of the cryogenic storage facility at Uran Terminal is currently in progress, which will enhance storage infrastructure on the west coast, facilitating higher imports. During the year 2023-24, BPCL procured four LPG rakes, taking the total to nine; they boosted our logistics capability, reduced the placement cost and reduced the bulk movement through road. In addition, the SBU has commissioned a new LPG terminal at Palakkad (Kerala), which optimized the transportation cost and improved reach. Further, the business was able to manage the same amount of cargoes with just five vessels, without a medium gas carrier vessel, thus leading to cost optimization.

Towards our commitment to the greening initiative, Solar plants of 580 Kilowatt-peak (kWp) capacity were commissioned at various LPG bottling plants, taking the total installed solar power capacity to 3,537 kWp. During the year, BPCL marketed more than 80,000 HTE (High Thermal Efficiency) hotplates with in-house developed patented technology that delivers 74% thermal efficiency, which is the highest in the industry.

High Tensile Strength Steel (HTS) cylinders, which are approximately 20% lighter than conventional cylinders, are being piloted in three markets. The use of these cylinders will substantially reduce the physical strain on delivery staff, while also generating cost savings. The LPG SBU also introduced Fluorocarbon (FKM) O-rings with improved mechanical strength, to extend the lifespan of O-rings, besides enhancing safety at customer premises.

To build competency, HSSE officers and Plant In-charges were provided training, and they received the internationally acclaimed National Examination Board in Occupational Safety and Health (NEBOSH) certification. To enrich the knowledge of our staff, the SBU has launched the ‘Eklavya: Knowledge portal’, conducting a daily quiz and having an archive of Sales, Operations, Logistics and Finance manuals. To equip our Distributors with the competencies to face the challenging business landscape, we trained more than 500 Distributorships in IIMs and other premium institutes.

AVIATION

The year 2023-24 witnessed phenomenal growth of Indian Aviation, promising a bright future for the sector. India has already become the third largest domestic Aviation market in terms of passengers, after USA and China. We are now likely to be the third largest for both, domestic plus international passengers combined, by 2026. The Government’s thrust for rapid Aviation growth through its several favorable policies, such as new Greenfield Airports through the PPP (Public Private Partnership) mode, operationalization of regional airports in Tier-II and Tier-III towns through the Ude Desh Ka Aam Naagrik (UDAN) policy etc., have encouraged domestic airlines to place huge aircraft orders. The traffic and ATF sales surpassed the pre-COVID level, with domestic recording the highest ever sales.

The Aviation SBU achieved sales of 1,901 TMT, as compared to 1,738 TMT in 2022-23, with a market share of 25.2%, as against 25.0% in 2022-23, registering a growth of 9.4% against the industry’s growth of 8.8%. Focusing on the domestic sector, which is 43.6 % of our total sales, the SBU was able to increase its share from 17.3% to 18.1%, with a growth of 15.1% compared to the industry’s growth of 9.7%. Major contributors were the Air India group, Indigo Airlines and Akasa Air. In the international segment, which contributes 53.5% of our total sales, the SBU successfully won all major tenders, and added the business of many new international airlines to our portfolio.

BPCL’s focus, to earn revenue from development of ATF infrastructure and operations of fuel facilities, has started yielding fruit. The fuel farm and hydrant system have been successfully commissioned at Mopa Goa, where the Company got the award to design, build, finance and operate the fuel facilities from GMR Goa International Airport Limited (GGIAL) for a period of 20 years. As domestic growth in smaller cities is better, we have built Aviation Fuel Stations at Jabalpur (Madhya Pradesh), increasing BPCL’s network to 67 in 2023-24. Prayagraj (Uttar Pradesh) and Surat (Gujarat) are in the final stage of commissioning.

As a leading ATF marketer and infrastructure provider, BPCL and Noida International Airport signed an agreement for laying a 34 km ATF pipeline from Piyala (Haryana) to Jewar (Uttar Pradesh), which will be the main supply source of ATF for the new greenfield open access airport. The work at Piyala-Jewar ATF pipeline has already started and will be completed before the start of commercial operations of Noida International Airport.

The Aviation SBU is jointly working with BPCL’s Research and Development Center and Refinery Projects team to meet the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) mandate and Government of India’s indicative Sustainable Aviation Fuel (SAF) blending target of 1%, 2% and 5% by 2027, 2028 and 2030 respectively, initially for international airlines. As an environment conscious business unit, we have started using EV vehicles at our Aviation Fueling Stations. We have also undertaken plantation drives and installed solar lighting at our facilities.

NEW BUSINESSES

BPCL’s initiative in offering consumables, durables and services in rural India has made an imprint in this market segment. The Company’s business model of leveraging its vast network of retail outlets and LPG distributorships to create Village Eco Centers and to provide the necessary support to rural women to become village-level entrepreneurs – ‘Urja Devis’, represents the ethos and values that BPCL has championed over the years. The Urja Devis are BPCL’s mascots in deep rural areas of the country, taking fuel and non-fuel offerings to the rural customers.

The Company has commissioned 191 In & Out stores and enrolled over 1,000 Urja Devis as of March 2024. Going forward, BPCL aims to expand aggressively in this space. The proof of concept of the comprehensive strategy of a unique, digitally enabled omnichannel, focusing on the burgeoning rural market, engaging customers through multiple, integrated digital and physical touchpoints, such as physical stores, websites, social media and apps, offering a seamless shopping experience.

RENEWABLE ENERGY

In line with national commitments, BPCL intends to diversify its energy portfolio by building a robust renewable energy business. The ambition is to build 2 gigawatt (GW) of renewable energy capacity by 2025 and 10 GW by 2035, through organic and inorganic routes. In this context, BPCL intends to aggressively pursue various initiatives as part of its Net Zero strategy and tap the investment opportunities to propel the journey of energy transition.

To explore prospects in this sector, the Renewable Energy (RE) business unit is striving to be a standalone revenue-generating and profit-making business unit, for execution of Renewable Power projects, along with harnessing the opportunities of inorganic growth. Pursuing clean energy objectives, the RE BU is diversifying the BPCL product mix to include greener energy in future. It plans to make BPCL a leading clean and renewable energy company by providing sustainable energy solutions through deployment of technology and innovation in a socially responsible manner. In supporting the cause of nurturing Mother Earth through cleaner energy solutions, the RE BU is implementing projects for the organization to be Net Zero (Scope 1 & 2) by 2040.

The following RE projects with a capital outlay of ₹ 1,299.58 crore were sanctioned in 2023-24:

Sr. No.	Location	Project Capacity	Approved Cost (₹ crore)
1	Ground Mounted Solar project at Prayagraj in UP	71 MWp DC / 52 MW AC	308.32
2	Wind farm projects in Madhya Pradesh and Maharashtra	100 MW each	966.26
3	Integrated Green Hydrogen Plant and Hydrogen Refuelling Station in Kochi, Kerala	200 Nm3/h	25.00
	Total		**1,299.58**

RE projects at Bina Refinery (18 MWp) and Kochi Refinery (13 MWp) have been commissioned and other solar projects of 72 MWp and wind projects of 100 MW are under various stages of execution.

In keeping with the National Green Hydrogen Mission, the following Green Hydrogen projects are under execution:

- BPCL's first Green Hydrogen plant of 5 MW Electrolyzer capacity is being implemented in Bina Refinery.
- BPCL is putting up a Green Hydrogen Refuelling station, with a capacity of 200 Nm^3/hr, along with an indigenously developed electrolyzer at Kochi along with CIAL. The Electrolyzer tender has been awarded and EPC tender is under evaluation.
- BPCL has been awarded a Green Hydrogen plant with production capacity of 2,000 MTPA through biomass-based pathways, under the Strategic Interventions for Green Hydrogen Transition (SIGHT) scheme through a Solar Energy Corporation of India (SECI) tender.

BRAND & PUBLIC RELATIONS

Crafting Sector Leadership

BPCL has strategically utilized diverse media platforms for fostering heightened brand awareness and loyalty and has strived to assert its dominance as a pioneering force in the energy landscape. Embracing the era of digital connectivity, BPCL has adeptly adapted to the evolving landscape, ensuring relevance and resonance in an age defined by dynamic digital interaction. Through these endeavors, the Company has carved out a distinctive identity in the minds of the audience.

Maximizing Brand Ambassador Impact

The culmination of our Brand Ambassador engagement journey marked a pivotal moment with the grand launch and release of our television commercials, setting a new industry standard. An extensive media plan was meticulously curated and executed to amplify our association, ensuring maximum engagement with our valued customers. Partnering with Asia Cup on Disney Hotstar OTT, we reached an impressive 6.2 crore unique two-wheeler and four-wheeler users, while our TVCs reached 50 lakh households on Connected TV. This campaign also showcased our Pure for Sure initiative, further enhancing our brand narrative. Additionally, our strategic positioning of MAK Lubricants as the Associate Broadcasting Partner for the ICC World Cup garnered widespread attention across television and OTT channels. Strategically timed during key match moments, these campaigns ensured sustained visibility and strong brand recall, with hashtags like #MrDependable and #MAKLubricants trending on India match days, signaling a transformative phase for our brand post-World Cup.

Brand Building Campaigns

Harnessing the star power of a Bollywood icon, MAK unveiled a co-branded TV commercial in collaboration with the blockbuster film, 'Jawan', seamlessly embodying the core attributes of our product. Surpassing all projections, this initiative ignited immense internal enthusiasm and revitalized our channel partners and customer base alike. Leveraging on-ground activations, interactive sessions with mechanics and partners, and strategic amplification across social media platforms and cinema screens, we attained an unparalleled level of engagement across all stakeholders. In August 2023, after a prolonged hiatus, BPCL repositioned itself as a corporate brand dedicated to serving the nation with a prominent newspaper insert on Independence Day. Published across leading national and state-level newspapers in multiple languages, the campaign featured the evocative tagline 'Hausla Aisa, Bharat Jaisa', striking a chord with readers and encapsulating the essence of patriotism. This advertisement marked a significant return after nearly two decades, reaffirming BPCL's commitment to its role as a national asset. BPCL left a substantial mark at the Abu Dhabi International Petroleum Exhibition & Conference (ADIPEC) 2023, our section at the India Pavilion vividly depicting the Company's vision of achieving Net Zero by 2040, reinforcing our commitment to sustainability and advancement. BPCL created waves, leading the change at the India Energy Week in Goa, emerging as a beacon of innovation and sustainability. Our pavilion was a testament to our unwavering commitment to lead the change towards a brighter and greener future, captivating visitors with its immersive experiences and forward-thinking initiatives.

Awards & Recognition

BPCL shone brightly with nine Excellence Awards from Public Relations Council of India (PRCI). A mix of Gold, Silver and Bronze were received for the best use of social media, best PR case study, rural development communication, website of the year, Annual Report 2022-23, impact in corporate communication, best communication film, etc. The accolades in diverse areas exemplify BPCL's steadfast commitment to excellence, progress and community empowerment.

BPCL's Experience Center achieved a Bronze in the 'Best Advance in Augmented and Virtual Reality' category at the 2023 Excellence in Technology Awards by Brandon Hall Group™, a renowned US-based research firm.

BPCL's Brand & PR Team received a Special Commendation for a significant presence on social media, excellence in customer service and the successful launch of various digital campaigns, at the Federation of Indian Petroleum Industry (FIPI) Oil & Gas Awards 2022.

BPCL received two awards for 'Communication Outreach' and 'Communication Leadership' during the 10^{th} PSU Awards ceremony organized by Governance Now.

BPCL garnered the ET Brand Equity Brand Disruption Award 2024 for MAK Lubricants' 'Mr. Dependable' Campaign, for creating an inflexion point through this campaign, within the industry and outside.

Media Coverage

In the current fiscal year, BPCL achieved its highest-ever media coverage, with an Advertorial Value Equivalent (AVE) crossing the ₹ 100 crore mark, surpassing last year's AVE of ₹ 49 crore, once again the highest among the OMCs. We also maintained the highest Share of Voice among OMCs, viz. 44.8%.

Informative Website

The website of the Company was upgraded this year to be more vibrant, interesting and enlightening. It was shifted to a new secured server with site redundancy security, to ensure zero downtime, in case of server unavailability. The website witnessed increased organic traffic by 21.4% over the last year.

Brand Engagement Through Social Media

In 2023-24, BPCL achieved high engagement ratio, averaging at 3.5% across all platforms. As proud leaders on 'X' and 'LinkedIn', boasting the highest number of followers among the OMCs, we have amassed a collective fan following of 2.18 crore across all social media platforms. Thanks to our compelling business and brand-focused content, we've achieved remarkable engagement ratios, setting new standards in social media excellence.

PROJECT ANUBHAV–BPCL'S DIGITAL TRANSFORMATION INITIATIVE

In the current fiscal year, BPCL continued its journey of transformative digital initiatives, aimed at revolutionising marketing strategies and enhancing customer-centric operations. This endeavor encompassed a diverse array of innovative tools and technologies, meticulously designed to augment customer engagement, streamline operational processes and foster sustainable business growth.

The 'HelloBPCL' mobile app and web portal continued to be a pivotal marketing platform that is instrumental in facilitating seamless customer engagement. Through targeted push notifications and optimized in-app experiences, customers were enabled to navigate effortlessly from order-to-payment, fostering enhanced engagement and retention. The further enablement for LPG consumers was made possible with the integration of the 'AadhaarFaceRD' mobile app from UIDAI, facilitating the eKYC via facial recognition of 2.7 million LPG consumers, thereby elevating the customer experience.

The ubiquitous 'Urja', the AI-enabled chatbot, continued to deliver exceptional customer experience on platforms such as WhatsApp and the HelloBPCL mobile app, by handling over 12 million converzations per year. It enhanced customer support, streamlined communication channels and gathered invaluable feedback and insights for continuous service enhancement.

Empowering customers fuelling at retail outlets, 'UFill 2.0', a unique customer-centric initiative, ensured a meticulous quality and quantity assurance, thereby enhancing customer trust. This was one of the three cornerstones of Project Anubhav – trust, convenience and personalization. Our CRM tool, 'Salesbuddy', helped the Company make the marketing efforts more personalized by garnering insights from almost 20 lakh of interactions of customers in FY 2024

In recent years, BPCL has digitally reimagined its extensive sales and distribution network through its IRIS platform, enabled with AI and the Internet of Things (IOT) system, which integrates fuel retailing stations, tank trucks, oil installations and depots, LPG bottling plants and industrial and commercial locations, to ensure efficient and sustained operations for delivering operational excellence. Catering to channel and network management needs, BPCL's mobile app, 'MAKonnect' seamlessly integrated with the HelloBPCL, secondary network management tool, bolstering secondary sales efficiencies in Lubricants Business.

BPCL adopted the cloud-first approach for digital transformation to provide agility and flexibility to support digital initiatives. The customized business-centric analytics were harnessed through industry leading Analytics platforms to furnish invaluable insights into customer behavior, market trends and data-driven decision-making.

Enabling businesses to create, manage and optimize fuel purchase experiences for both B2C and B2B customers, Commerce Cloud solutions facilitated online ordering for industrial fuels and solvents, recharge options for SmartFleet customers, and lubricant ordering for retailers and channel partners, driving significant sales through digital channels.

Social media management tools were developed to equip businesses to effectively manage multiple social media accounts, schedule posts and track engagement metrics, bolstering the HelloBPCL brand and facilitating impactful social media marketing strategies.

BPCL's unwavering commitment to leveraging digital tools and platforms has positioned it at the forefront of innovation, enabling the organization to seize new opportunities, optimize marketing endeavors and deliver unparalleled experiences that drive customer satisfaction and loyalty.

CORPORATE STRATEGY

The past couple of years has been tumultuous for the global energy sector, characterized by significant geopolitical uncertainty, the reshaping of energy trade routes, and heightened and volatile energy prices. Concurrently, these events have catalyzed substantial long-term policy shifts, refocusing attention on energy security and the diversification of supplies and domestic production.

India is emphasizing 'universal energy access and just, affordable, and inclusive energy transitions'. This policy direction aligns with global environmental goals and underscores India's commitment to fostering an energy sector that is both sustainable and equitable.

This underscores the critical need for sustained investment in oil and gas to meet the energy needs of India while transitioning to low carbon solutions in a responsible manner.

In the midst of these global shifts and national policy alignments, The Company's Project Aspire emerges as a strategic response, designed to leverage these new realities and position the company for future growth.

Project Aspire

Project Aspire, spearheaded by the Corporate Strategy team, is designed to significantly enhance the Company's overall business and financial performance. The project targets a doubling of profits from the 2021-22 baseline. As a pivotal element of the Company's growth strategy, the initiative involves a capital expenditure commitment of Up to ₹ 1.7 lakh crore over five years.

The Project Aspire is built on eight pillars: Refining, Marketing, Non-Fuel Retail, Gas, Upstream, Petrochemical, Green Energy Business and Digital Ventures. These areas represent the core and emergent strengths of BPCL, driving both, current operations and future expansion.

The strategic execution of Project Aspire is organized around four key themes:

- **Core Business Growth:** This theme focuses on nurturing and expanding the Company's existing core businesses to reinforce its market presence and operational stability.
- **Strategic Investments:** Significant capital is allocated to five strategic areas: Gas, Non-Fuel Retail, Petrochemicals, Green Energy and Digital Ventures. These sectors are identified as transformative bets with the potential to catalyze substantial growth.
- **Foundation Strengthening:** The project emphasizes enhancing foundational components of the Company's operations, including Research & Development, financing mechanisms, digital transformation and strengthening partnerships.
- **Organizational Development:** It prioritizes organizational fortification and substantial investment in talent development, aiming to build a resilient and forward-thinking workforce.

As the Company continues to implement Project Aspire within defined timelines, this strategic initiative positions the Company to leverage new opportunities and foster growth in a dynamic global energy landscape, thereby creating long-term value for its shareholders, while committing to sustainability and innovation.

Corporate Strategy is evaluating M&A opportunities in sectors like non-fuel, renewables, hydrogen, biofuels etc. to meet the long-term aspiration of BPCL to become an integrated energy company.

Project Ankur

Over the last few years, India has become home to a flourishing ecosystem for startups. Under the 'Startup India' initiative, Department for Promotion of Industry and Internal Trade (DPIIT) has recognized 1,23,900 companies as startups as on March 2024. Equipped with agile ways of working, technology-driven businesses have adopted an innovative approach to solve challenges in various sectors; hence, startups have emerged as a favourite destination for angel investors, venture capital funds and corporates for investments.

The Company, in its own way, has become part of India's startup growth story with its startup initiative, 'Project Ankur' supporting budding and promising startups through grant funding and collaboration since 2016. The Company, with an initial fund of ₹ 25 crore, has supported 25 startups in various sectors with grant funding of up to ₹ 1.5 crore per startup in Phase I. As part of Phase II, BPCL has supported six more startups through BPCL Startup Grandslam Season#1 (a pan-India business challenge for startups) with grant funding of ₹ 50 lakh each.

To amplify the outreach and effectiveness of Ankur, the Company continuously engages with the startup ecosystem in India, including Startup India, leading academic institutions, incubators, accelerators and venture capital investors.

The Company has allocated ₹ 50 crore for investment in startups. The objective of these investments is to support high potential early-stage startups, mainly working in sectors which are affiliated to the areas of business of the Company. The Company is planning equity investments in startups through private trusts.

HEALTH, SAFETY, SECURITY & ENVIRONMENT (HSSE)

For details on HSSE, refer page 175 under the Business Responsibility and Sustainability Report.

HUMAN RESOURCES

We are committed to fostering a dynamic and capable workforce to drive our business objectives forward. Through a meticulous recruitment process, robust training programs and ongoing development initiatives, we strive to cultivate a workforce, that is not only proficient in their respective roles, but also adaptable to the ever-evolving demands of the industry. Our dedication to employee growth and empowerment serves as the cornerstone of our organizational ethos. We recognize that the growth of our organization is closely linked to the growth of our employees. Guided by this belief, we have initiated a series of strategic endeavors. These initiatives are meticulously crafted to unlock the inherent talents and capabilities of our workforce, thereby fostering a culture of innovation and excellence that resonates through every aspect of our organization. With an objective to empower employees to take charge of their careers, an opportunity was provided to express career aspirations and achievements on an online portal. The initiative witnessed active participation of 95% of our target audience. To celebrate the unique strengths of our employees with a spotlight on their areas of growth, stated career aspirations and a roadmap for our future, comprehensive Talent Review Discussions were conducted for 1,172 officers, who were selected for Phase One of discussions this year. All line managers were facilitated and equipped, through comprehensive orientation sessions, to lead such discussions in respect of their team members.

In line with the learning aspirations of the organization, as well as to groom future leaders, a host of learning opportunities were introduced, extended as well as sustained, such as General Management Programs and Management Development Programs at premier institutes, Flagship Inhouse Leadership Development Programs- 'eXcelerator' and 'eXceed', mandatory, custom and outbound learning programs, etc., leading to around 40% increase in learning hours vis-a-vis last year. To meet the learning aspirations of each individual and to enable them to take charge of their growth, a comprehensive education policy was introduced, leading to revision in the existing education assistance scheme and introduction of a policy for full-time sponsorship of education in identified premier institutes under the meritorious management program.

Aligned with our core belief of nurturing our people capabilities and to provide a best-in-class learning experience, 'My Sphere'-a revolutionary new digital learning and management platform-was introduced. Significant thrust was placed on actualization of learning goals identified as part of the talent assessment process. The year witnessed a substantial rise in individuals taking complete charge of their development through creation of an Individual Development Plan (IDP). We also rolled out a customized development intervention to develop Brand Champions by 'Building a Timeless Brand' in collaboration with the Indian School of Business. The program spanned across four days, aimed at sensitizing Brand & PR role holders across businesses and entities to the overarching brand promise and purpose and to enable them to learn the best practices of building strong brands from successful organizations. In collaboration with the L&T Institute of Project Management (IPM), we facilitated a five-day classroom based preparatory program towards Project Management Professional (PMP) certification. This program targets a cohort of 100 Project Managers across Refineries and Entities, to further bolster project execution capabilities in respect of mega projects initiated as part of Project Aspire.

By fostering a culture of innovation and empowerment, we not only unlock the full potential of our workforce, but also inspire them to push boundaries, challenge norms, and redefine what's possible. Through various engagement programs and platforms, we provide our employees with the tools, resources and opportunities they need to thrive. To cultivate and proliferate the innovation potential of individuals and teams, the Ideas platform was launched in a new avatar with a host of new and exciting features. With the aim of harnessing the collective strength of employees and achieving a symphony of synergy, the alternate learning platforms were elevated and transformed to introduce a 'Talent Triathlon: Aspire, Achieve, Inspire'. The Talent Triathlon amalgamated three flagship events of ours-Socratix (the case study challenge), Mercurix (the art of storytelling/story writing), and Biz-X (the online business simulation challenge) in a team-based format culminating in 'The Ultimate Challenge', a thrilling fusion of intellectual challenges and outbound experiences. An overwhelming number of 1,160 officers registered for the challenge. Taking strides towards our endeavor to promote a culture that is open, values employee opinion and creates the best employee experience, the second edition of the 'Voice of Employee' survey was launched. The survey received a tremendous response, with 88% of our officers sharing their inputs.

We hold our employees' welfare in the highest regard, viewing them not just as contributors to our success, but as valued individuals whose well-being is paramount. With this philosophy guiding our actions, we have implemented a wide array of comprehensive initiatives tailored to ensure their health, happiness and holistic development. Promoting the philosophy of 'a healthy mind resides in a healthy body', Fitness Premier League (FPL) 1.0 was launched as a one-of-a-kind initiative to promote wellness through sports. The initiative saw an overwhelming response of over 1,700 participants across multiple events, including the MAK Cup for cricket, badminton and lawn tennis tournaments. Under FPL 1.0, Step-A-Thon, a four-week health challenge garnered remarkable engagement with more than 1,300 employees setting an example of excellence and teamwork by collectively achieving 5.3 crore steps.

EMPLOYEE SATISFACTION ENHANCEMENT (ESE)

The ESE Entity of the Company works dedicatedly in its endeavor to make BPCL 'A Great Place to Work'." The team continually focuses on touching and positively impacting employees' lives to ensure a productive, vibrant and energized workforce.

BPCL believes in creating awareness and sensitizing employees about emotional health and promoting a psychologically safe environment. ESE role holders visit locations to strengthen the employee connect and provide them with an opportunity to share their concerns, personal grievances, etc. In 2023-24, the ESE team members visited 82 locations and had interactions with 1,103 employees.

The key initiative of ESE is Roshni Plus, an Employee Assistance Program (EAP). Through this initiative, professional psychological counselling services are made available to all employees and their dependent family members. The EAP vendor ensures that the services are provided in a confidential and cost-free manner. Thus, employees have easy access to professional psychological counselling services in dealing with any kind of anxiety or stress arising out of personal or professional reasons.

ActivLife webinars are conducted fortnightly on subjects around work-life balance, mindfulness and healthy habits. We have conducted 22 webinars, which were attended by 1,919 participants. There were nine offline seminars, which covered 247 participants across locations. There are varied e-publications on topics related to work life and emotional health, which include 25 Interconnect newsletters published fortnightly, a quarterly e-magazine, 'Prerna' covering various relevant topics in the realm of the science of positive psychology, as well as a section on personal motivational stories of employees. There were 17 ESE mailers sent to employees via corporate broadcast with links to insightful articles, and self-assessments for employees to benefit in respect of holistic well-being.

Another initiative of BPCL ESE is 'Sahkarmi Mitra'. There are totally 68 Sahkarmi Mitras, each one being nominated from employees at larger locations. They act as the emotional first-aid and normalize conversations around mental health. These Sahkarmi Mitras are given soft skills training to hone their talents.

This year, the BPCL ESE team spearheaded a Mental Health Awareness Campaign in October 2023. On October 10, 2023, on World Mental Health Awareness Day, a Mental Well-being Pledge was taken by the Board members and BPCL employees at the team level, to reiterate our commitment to employee well-being. There were various online contests, emotional well-being polls and seminars at locations organized in this awareness month.

To encourage leaders to focus on holistic mental well-being, two residential wellness retreats were organized, covering 41 leaders. The goal was to unwind, rejuvenate and help the participants rediscover their authentic selves, through exposure to self-experiential ancient healing techniques, as well as modern scientific methodologies. The program received excellent feedback. Participants also carried back with them some daily routine practices, including morning and night rituals, spurring them on the path to happiness, good health and a satisfying life.

Apart from the regular location visits, webinars and awareness programs, we organized a conclave called 'Thrive 24: Nourish to Flourish' on March 12, 2024 on the theme, 'Empowering Mindful Leadership'. The conclave aimed to help leaders nourish themselves through various topics pertinent to mindful leadership, including self-awareness, self-care, compassion and presence. They also explored the path to developing a resilient workforce and ensuring psychological safety in the workplace. The sessions were conducted in varied formats, such as a fireside chat with senior leaders, learning hour, laughter therapy and panel discussions.

INTEGRATED INFORMATION SYSTEM (IIS)

BPCL is continuously treading a digital transformation journey towards improving processes, increasing productivity, enhancing customer value and convenience. This involves business process re-engineering to leverage the capabilities of digital technologies and improve the engagement of internal and external stakeholders, viz. automation of CNG accounting, intelligent asset management application, warehousing solution for consumer retailing business, etc.

The IS and LPG teams, along with other OMCs & Public Financial Management System (PFMS), under the guidance of MoP&NG, enabled the Beneficiary Master process on the Common LPG Data Platform (CLDP). The team also worked on extending the CLDP platform for Phase I & II of the LPG subsidy processing to eligible beneficiaries along with advanced MIS. System support was provided for implementation of various Government initiatives e.g., facial recognition based eKYC, State Schemes, etc.

BPCL conducted a security exercise which simulates real world attack techniques, with the purpose of enhancing security controls implemented in different IT systems. The

Company also initiated comprehensive cyber security assessment through a third party Government Auditor, with the objective of identifying and addressing security issues early and reducing risks. The audit covered the systems of Information Technology (IT), Operational Technology (OT) and Digital initiatives.

BPCL was ranked among the Top 10 accreditations worldwide for Customer Centers of Expertise by SAP.

INTERNATIONAL TRADE & RISK MANAGEMENT (ITRM)

BPCL's ITRM setup is responsible for all activities related to the import of crude, import/export of products and Commodity Risk Management through derivative transactions.

To meet the requirement of BPCL Refineries, ITRM procures crude oil, both indigenously and through imports. After considering the domestic demand and supply situation, petroleum products are imported and exported. Allied services of ship chartering and operations are also facilitated by ITRM. Further, the ITRM setup includes an active Derivatives Desk engaged in risk management activities via the paper (financial derivatives) market.

During the financial year, 39.86 MMT of crude oil was procured for BPCL group refineries. Three new grades of crude oil were procured for processing during the year. Continuing its success in procuring spot crude oil through its own Crude Oil Trading Desk, 16.89 MMT were sought through spot procurement in the financial year, thereby capturing opportunities in the oil market across the globe. The Trading Desk follows a comprehensive trading policy and has a robust governance framework, that ensures the highest levels of controls in spot crude oil procurement are met at all times.

The year 2023-24 was again a volatile one for the crude, product and freight market and all exhibited high variations in price levels. A flare-up in global geopolitical threats and risks to oil trade and supply chains were major contributors to the volatility seen in the prices of both oil and freight, throughout the year. International Trade rose to the challenge and proactively met the challenges of the new order in the world oil market and ensured maximum value to the Corporation through excellent planning and efficient execution.

The ITRM Chartering team was always cognizant of the freight arbitrage that arises periodically between Suez max and VLCC vessels and captured significant value for BPCL by exploiting such arbitrage opportunities throughout the year.

Over the years, ITRM has collaborated and rendered assistance to all major commodity exchanges in India and contributed in developing the commodity derivative eco-system in the country for effective risk management. Recognizing these efforts, the Multi Commodity Exchange (MCX), the leading commodity exchange of the country, conferred their prestigious award–'Mentor–Energy Segment' on BPCL.

ITRM has proven to be an invaluable asset for the Company in creating value through identifying new geographies for sourcing better-value crude oils, efficient freight management by leveraging all options available in the market, containing the risk of volatile prices through effective risk management and meeting the challenges of the ever-changing and dynamic oil markets. These achievements are a result of synergies that are nurtured through interactions with various stakeholders. ITRM has been successful in mitigating the geopolitical and concentration risks by diversifying the crude basket across geographies and suppliers. With robust policies and a sound governance framework, and a world-class team of dedicated manpower, ITRM will continue to contribute to the Company's journey towards excellence.

RESEARCH AND DEVELOPMENT (R&D)

R&D is crucial for business growth and sustainability, with Intellectual Property Rights from R&D offering market differentiation and promoting indigenous technologies for 'Atmanirbhar Bharat'. BPCL's Corporate Research & Development Center (CRDC) focuses on niche Petrochemicals, Biofuels, Alternate Energy, Green Hydrogen and Carbon Dioxide mitigation.

During the year 2023-24, CRDC achieved significant milestones in Green Hydrogen. At India Energy Week, CRDC showcased and demonstrated an indigenous alkaline electrolyzer, jointly developed with Bhabha Atomic Research Center (BARC), for Green Hydrogen production. A Green Hydrogen refueling station for buses is being set up at Cochin International Airport (CIAL). To foster the spirit of collaboration, an MOU was inked with M/s. Kirloskar Oil Engines Ltd. for the joint development of H-CNG and H2-ICE based Gensets.

As part of import substitution, R&D programs were undertaken to develop pathways to produce niche process chemicals and catalysts using refinery streams. To valorize the acrylic acid production in KR, CRDC developed polyacrylic acid-based additives for industrial water treatment, Carbomer 940 for cosmetic applications, and processes to produce Methacrylic Acid (MAA) and Maleic Anhydride (MAN) from isobutylene streams. Likewise, advancements were made in carbon capture and utilization to accomplish the corporate Net Zero 2040 vision. Efforts continued to develop cost-effective and energy-efficient CO_2 capture processes. CRDC's well-proven HiGee technology is being augmented to capture CO_2 via energy efficient solvents developed in-house. Similarly, a Simulated Moving Bed process is being developed that captures CO_2 via adsorption with high efficiency and low energy requirement. New products, namely anode grade coke and EPA grade test fuel (diesel) were developed by carrying out successful trials at KR. Likewise, JP-7 grade aviation fuel was developed in collaboration with DRDO.

The Product & Application Development Center's (P&AD) R&D team is working on developing novel automotive, industrial and eco-friendly lubricant formulations to meet business demands. These include fuel efficient engine oil compatible with ultra-modern heavy-duty diesel commercial vehicles, engine oils compatible with biofuel, a high-performance heavy-duty diesel engine oil for the auxiliary power unit, engine and transmission system of new generation defence equipment, universal tractor transmission oil for high horsepower tractors and a non-staining hydraulic oil for the aluminium industry. Lubes R&D also developed a fully synthetic air compressor oil for effective lubrication of severe duty reciprocating compressors, a high-performance long-life gas engine oil with the potential to extend engine oil drain interval for buses and on-highway light and heavy-duty trucks (BS-VI) running on CNG and an innovative single phase synthetic immersion coolant for data center servers, as a smart liquid cooling solution.

During the year, research by the CRDC team resulted in the grant of seven patents. Also, six new patent applications were filed during the year. BPCL's R&D department is generating revenue by implementing and commercializing various R&D solutions.

EXPLORATION AND PRODUCTION OF CRUDE OIL AND GAS THROUGH WHOLLY-OWNED SUBSIDIARY BPRL

Operations of the Company

Bharat PetroResources Limited (BPRL), the upstream arm of BPCL, has Participating Interest (PI) in fifteen blocks, of which eight are in India and seven overseas, along with equity stakes in two Russian entities holding the license to four producing blocks in Russia. Five of the eight blocks in India were acquired under different rounds of the New Exploration Licensing Policy (NELP), one block was awarded under Discovered Small Fields (DSF) Bid Round 1 and two blocks were awarded under the Open Acreage Licensing Policy (OALP) Bid Round I. Out of the seven overseas blocks, three are in Brazil, two in the United Arab Emirates (UAE) and one each in Mozambique and Indonesia.

BPRL has wholly-owned subsidiary companies located in the Netherlands, Singapore and India. The subsidiary located in the Netherlands, i.e., BPRL International BV, in turn, has four wholly-owned subsidiary companies, viz., BPRL Ventures BV, BPRL Ventures Mozambique BV, BPRL Ventures Indonesia BV and BPRL International Ventures BV.

BPRL Ventures BV has 63.24% stake in IBV Brasil Petroleo Limitada, which currently holds PI in three blocks in offshore Brazil. BPRL Ventures Mozambique BV has PI of 10% in a block in Mozambique, and BPRL Ventures Indonesia BV holds PI of 16.2% in a block in Indonesia. BPRL, through BPRL International Ventures BV, has 30% stake in Falcon Oil and Gas BV, which holds 10% stake in the Lower Zakum Concession in offshore Abu Dhabi, UAE.

Further, BPRL's wholly-owned subsidiary in Singapore, i.e., BPRL International Singapore Pte Ltd. (BISPL) holds 33% each in two Special Purpose Vehicles (SPV), i.e., Taas India Pte Ltd. (TIPL) and Vankor India Pte Ltd. (VIPL), which hold 29.9% and 23.9% in the Russian entities LLC Taas-Yuryakh Neftegazodobycha (TYNGD) and JSC Vankorneft, respectively. BISPL further holds 50% stake in Urja Bharat Pte Ltd. (UBPL) in Singapore, which is the Operator of Onshore Block 1 concession in Abu Dhabi with 100% PI. The subsidiary in India, viz., Bharat PetroResources JPDA Limited, held PI in a block in Timor Leste, which has been relinquished.

CURRENT STATUS OF BLOCKS

OVERSEAS ASSETS

Russia

BPRL, along with Oil India Ltd. (OIL) and Indian Oil Corporation Ltd. (IOCL), jointly referred to as the Indian Consortium (IC), holds 23.9% stake in JSC Vankorneft; and 29.9% stake in LLC TYNGD through joint ventures Vankor India Pte Ltd. (VIPL) and Taas India Pte. Ltd. (TIPL), respectively, both incorporated in Singapore.

In JSC Vankorneft, the remaining stake is held by LLC Vostok (50.1%) and ONGC Videsh Vankorneft Pte Ltd. (26%). During the year 2023-24, JSC Vankorneft produced approximately 8.91 million Metric Tonnes (MMT) of oil and 4.41 billion cubic metres (BCM) of gas (BPRL's effective share being 0.70 MMT of oil and 0.35 BCM of gas). During the year, the IC received a dividend amounting to Rub 8.59 billion, i.e., approximately $ 92.1 million (with BPRL's effective share being approximately $ 30.4 million).

In LLC TYNGD, the stake is held along with RN Upstream LLC (50.1%), a Rosneft Group company, and BP (20%). During the year 2023-24, TYNGD produced approximately 5.14 MMT of oil and 5.04 BCM of gas (BPRL's effective share being 0.51 MMT of oil and 0.50 BCM of gas). During the year, the IC received dividend amounting to Rub 16.3 billion, i.e., approximately $ 175 million (with BPRL's effective share being approximately $ 57.8 million).

United Arab Emirates (UAE)

Lower Zakum Concession

BPRL, along with IOCL and OVL, hold a 10% stake in the offshore producing oil asset, Lower Zakum Concession in Abu Dhabi, UAE. The Indian Consortium's share in the Lower Zakum Concession is held through Falcon Oil & Gas B.V., an SPV incorporated in the Netherlands, in which BPRL holds 30% shares through its step-down subsidiary BPRL International Ventures B.V in the Netherlands. The other partners are Abu Dhabi National Oil Company (60%), JODCO (10%, a wholly-owned subsidiary of Japan's INPEX Corporation), China National Petroleum Corporation (10%), Italy's ENI (5%) and France's Total S.A. (5%).

During the year 2023-24, the concession produced 17.95 million Metric Tonnes of Oil Equivalent (MMTOE) (BPRL share:0.54 MMTOE). Also, notably, BPCL Group Refineries could access approximately 4.02 million barrels (0.54 MMT) of Das Blend Crude Oil as its equity oil share from the Lower Zakum Concession. BPRL International Ventures B V received dividend of $ 13.80 million in the FY 2023-24.

The long-term plan in the Concession is to further extend and sustain the oil plateau through its future development plan, which shall be implemented in three phases. The Long-term Development Plan-1 is currently under review by stakeholders.

Onshore Block 1 Concession

BPRL, jointly with IOCL, was awarded the Onshore Block 1 Concession as Operator with 100% PI in March 2019 under the Abu Dhabi 2018 Block Bid Round. The block is held by Urja Bharat Pte Ltd, a 50:50 joint venture company of wholly-owned subsidiaries (WOS) of BPRL and IOCL, incorporated in Singapore.

Onshore Block 1 covers an area of 6,162 sq.km located in the Al Dhafra region around Ruwais City and the refining complex, including the coastal region to the west. There are two existing undeveloped discoveries in the area, named Ruwais and Mirfa, in addition to available prospects/leads for exploration. The drilling and testing of appraisal wells in Ruwais Discovery were completed in 2021, and the presence of hydrocarbons was established. The approval of the Ruwais Field development plan was received from the Regulator in April 2024. After execution of Ruwais Production Concession agreements (PCA), development related activities shall commence.

In the remaining part of the block area, four exploratory wells have been drilled successfully, the presence of hydrocarbons has been established in two wells and testing operations are ongoing.

Mozambique

BPRL, through its Netherlands based step-down subsidiary company BPRL Ventures Mozambique B.V., holds 10% PI in Offshore Area 1, Rovuma Basin Concession in Mozambique. Total E&P Mozambique Area 1 Limitada, a wholly-owned step-down subsidiary of Total S.A. is the Operator with 26.5% PI, and the other consortium partners are Mitsui E&P Mozambique Area 1 Ltd. (20%), ENH Rovuma Área Um, S.A. (15%), ONGC Videsh Rovuma Ltd. (10%), Beas Rovuma Energy Mozambique Ltd. (10%) and PTTEP Mozambique Area 1 Ltd. (8.5%).

Following the discovery of vast quantities of natural gas in Rovuma Offshore Area 1 off the coast of northern Mozambique, Area 1 consortium partners announced Final Investment Decision (FID) on June 18, 2019 to initially develop a 2x6.56 MMTPA-Train onshore LNG project for monetization of the gas discovered from the offshore Golfinho-Atum discovery area.

After FID, while the project was on schedule and within the budget till March 2021, due to the security incidents around the Afungi Project Site during end March 2021, the consortium has declared *force majeure*.

The Government of Mozambique is working towards the re-establishment of peace and resolving the security situation. The Mozambican military, along with joint forces from Rwanda and the Southern African Development Community (SADC), continue their operations in the region.

During the year 2023-24, in order to contribute to the stabilization of livelihoods of the communities in Northern Cabo Delgado, the project implemented various comprehensive socio-economic initiatives under ‘Pamoja Tunaweza’, aimed at generating revenues for the communities, developing the local economy, preserving the biodiversity and promoting human rights.

There has been an improvement in the security situation and the project is expected to restart soon after receiving satisfactory assurances regarding the security in Cabo Delgado province.

Brazil

IBV Brasil Petroleo Limitada (IBV), incorporated in Brazil, a joint venture company of BPRL Ventures BV with 63.24% shareholding, as on March 31, 2024 and Videocon Energy Brazil Ltd. (VEBL), step-down subsidiaries of BPRL and Videocon Industries Limited, respectively, currently holds PI in three deep-water blocks in two concessions.

Sergipe Alagoas (BM-SEAL-11) Concession

IBV holds 40% PI in the concession and the remaining 60% is held by the Operator, Petrobras. The Concession currently consists of two blocks - SEAL-M-426 and SEAL-M-349. The Operator, on behalf of the Concessionaires, submitted the Field Development Plans to the Regulator (ANP) in November 2022. Currently, procurement activities are ongoing for the Floating Production Storage & Offloading (FPSO) unit and other long-lead items.

Campos (BM-C-30) Concession

In the BM-C-30 Concession, IBV holds 35.71% PI and PetroRio Jaguar Petroleo Ltda as the Operator holds 64.286% PI. IBV had initiated Arbitration against the Operator in the International Chamber of Commerce (ICC) London against Exclusive Operations for development of the Wahoo Discovery by the Operator. On April 12, 2024, IBV received the final award of the Arbitration proceedings and its claims were dismissed. Hence, it was further appealed in the High Court, London.

Further, Arbitration proceedings are also ongoing at ICC New York with Ovintiv under the Share Sale Agreement and the same is being defended by BPRL.

Indonesia

BPRL has a PI of 16.2%, held through its step-down subsidiary BPRL Ventures Indonesia BV. PT Pertamina Hulu Energi Nunukan Company (PHENC), a wholly-owned subsidiary of Pertamina, the National Oil Company of Indonesia, has the balance 83.8% PI in the consortium and is the Operator. The Production Sharing Contract (PSC) was signed on December 12, 2004 and is valid for a period of 30 years, i.e., till 2034. The block is located in shallow waters offshore of Bunyu Island in the Tarakan basin of North Kalimantan province.

The minimum work program committed as per the PSC under the exploration phase has been completed. The results of the appraisal drilling program, geological, geophysical and reservoir studies, along with an independent reserve certification, have indicated substantial reduction in the recoverable oil and gas resource volume from the Parang discovery. Various options are being evaluated to decide the way forward in the block, including submission of a revised Plan of Development, by the Operator.

BLOCKS IN INDIA

Operated Blocks

CB-ONN-2010/8 (Onshore Cambay Basin, Gujarat)

Under NELP-IX Bid Round, a BPRL-led consortium was awarded one on-land block CB-ONN-2010/8, in Cambay basin. BPRL is the Lead Operator with 25% PI and the other consortium partners are GAIL (India) Ltd. - 25% PI (Jt. Operator), Engineers India Ltd. (EIL) - 20% PI, BF Infrastructure Ltd. (BFIL) - 20% PI and Monnet Ispat & Energy Ltd. (MIEL) - 10% PI. Due to MIEL's cash call payment default under the Joint Operating Agreement (JOA), the other non-defaulting parties have agreed to distribute MIEL's 10% PI in proportion to their existing share.

During the initial exploration period, two discoveries were made, and the Field Development Plan was approved by Directorate General of Hydrocarbons (DGH). However, in view of unviable project economics, BPRL submitted a relinquishment proposal to DGH, which is under approval. Miscellaneous closure activities such as Plugging and Abandonment (P&A) and Site Restoration (SR) activities for four dry wells have been completed. P&A and SR activities for two discovery wells shall be completed after obtaining approval from DGH for relinquishment.

CB-ONHP-2017/9 (Onshore Cambay Basin, Gujarat)

The block CB-ONHP-2017/9 in Cambay basin, Gujarat was awarded to BPRL under OALP Bid Round-I, and the Revenue Sharing Contract (RSC) of the block was signed with the Government. of India on October 1, 2018. BPRL is the Lead Operator in the block with PI of 60% and ONGC is the partner with 40% PI.

Based on integrated interpretation of seismic and well data of existing wells in the block, three prospective locations were identified for drilling of exploratory wells. Drilling of three wells Vanthwadi #01 (VTW#01), Varsola (VSL#01) & Virol (VRL#01) has been completed up to target depth and testing of wells is in progress.

CY/ONDSF/Karaikal/2016 (Onshore Cauvery Basin, Tamil Nadu)

BPRL was awarded the Karaikal Contract Area in the Discovered Small Field (DSF) Bid Round of 2016 with 100% PI. The Petroleum Mining Lease (PML) for the block is awaited from the State Govt. of Tamil Nadu, and support of DGH has been sought to expedite the same.

Non-Operated Blocks

CY-ONN-2002/2 (Madanam Field, Onshore Cauvery Basin, Tamil Nadu)

BPRL has PI of 40% in an On-land block CY-ONN-2002/2 in the Cauvery basin, with ONGC being the Operator with 60% PI. During FY 2023-24, 68,102 MT of oil (BPRL share: 27,241 MT) and 27.54 mmscm of gas (BPRL share: 11.01 mmscm) has been produced from the block. A limited quantity of natural gas is being monetized and was sold to GAIL since Q4, FY 2023-24.

CY-ONN-2004/2 (Onshore Cauvery Basin, Tamil Nadu)

BPRL has PI of 20% in this block, and ONGC with PI of 80% is the Operator of the block. The Field Development Plan (FDP) was approved on July 13, 2017 and the first two developmental wells drilled did not yield the desired results, due to which additional sub-surface studies are being carried out.

CB-ONN-2010/11 (Onshore Cambay Basin, Gujarat)

CB-ONN-2010/11, the onshore block, was awarded by the Government of India to a consortium consisting of GAIL (Operator), BPRL, Engineers India Ltd. (EIL), BF Infrastructures Ltd. (BFIL) and Monnet Ispat & Energy Ltd. (MIEL), under NELP IX Bid Round. Due to MIEL's cash call payment default under the Joint Operating Agreement (JOA), the other non-defaulting parties have agreed to distribute MIEL's 15% PI in proportion to their existing share. Also, due to non-participation of BFIL in the development phase of the block, the revised PI for the block stands as GAIL 47.06%, BPRL 29.41% and EIL 23.52%. The Field Development Plan of Galiyana was approved on February 10, 2020. The field development was completed in 2023 and crude oil production commenced on March 18, 2023. Total crude oil production in FY 2023-24 was 6,446 bbls (870 MT) at the Consortium level (BPRL Share: 256 MT).

AA-ONN-2010/3 (Assam Arakan Basin, Assam)

AA-ONN-2010/3, an On-land block, was awarded by the Government of India to a consortium consisting of OIL, ONGC and BPRL under NELP IX Bid Round. OIL with 40% PI is the Operator of the block. BPRL has 20% PI and ONGC holds 40% PI in the block. The Minimum Work Program (MWP) committed by the consortium in the block has been completed. Due to complications during drilling of the MWP commitment well SDYA-1, it was plugged and abandoned. The Operator has requested DGH/MoPNG for a three-year extension for drilling of a replacement well in the block. Response from DGH is awaited.

AA-ONHP-2017/12 (Assam Arakan Basin, Assam and Arunachal Pradesh)

The Government of India awarded the block AAONHP-2017/12 to OIL under OALP I Bid Round. BPRL farmed into the block with a PI of 10% in December 2019. The other consortium partners of the block are OIL (60% PI) as Operator, IOCL (20% PI) and Numaligarh Refineries Limited (10% PI). The exploration period has been extended for one year and is valid till November 23, 2024. The committed Minimum Work Program (MWP) in the block is completed except for drilling of two wells. Statutory clearances are being obtained for MWP wells from the respective authorities.

Blocks Relinquished During the Year

Potiguar (BM-POT-16) Concession, Brazil

IBV held 20% PI in the BM-POT-16 concession along with the Operator, Petrobras (30% PI), BP (30% PI) and Petrogal (20% PI). The Concessionaires have withdrawn from the Concession and necessary approvals from the Regulator have been received. Final settlement amongst the Consortium partners is ongoing.

BUSINESS PROCESS EXCELLENCE CENTER (BPEC)

The Business Process Excellence Center (BPEC) is a centralized setup for handling various business processes enhancing efficiency, standardization, and optimization of manpower resources across the organization, covering processing of non-hydrocarbon vendor payments including Site Rentals, Accounts Receivable, Centralized Payroll, Post-Retirement Benefits and Centralized GST.

During the journey towards centralization, digital transformation and automation, BPEC has migrated various allied processes associated with standard processes namely, customer account clearing, collection management, dispute management through enhanced internal controls, improvement in working capital management, meaningful insights through data analytics as well as automation and standardization of processes, resulting in optimum utilization of resources, benchmarking best practices, excellence in execution and commitment for compliance.

BPEC processed 5.18 lakh vendor invoices amounting to ₹ 30,374 crore, with a substantial number of invoices processed within 10 days of receipt at BPEC. The Digital Invoice Management (DIM) Portal is an initiative allowing vendors to upload their invoices seamlessly on a real time basis. Due to the constant efforts made by BPEC, the volume of invoices uploaded by vendors digitally has increased, from 82% during the year 2022-23 to 84% in the current financial year, resulting in transparency, reducing the processing time and promoting the green initiative.

Recognizing the vital role that Micro, Small and Medium Enterprises (MSMEs) play in socio-economic growth, employment opportunities, eradication of poverty, etc. the Company has created a separate cell for MSMEs to ensure uninterrupted and prompt payments to them. Further, the Company has implemented Trade Receivables electronic Discounting System (TReDS), which is a digital platform to support MSMEs to get their invoices financed at a competitive rate, facilitating timely payment through an auction, where multiple registered financiers can participate.

Consequent to the focussed efforts for facilitating MSME bill discounting, there has been a considerable increase in the quantum and value of MSME bills discounted for the year 2023-24. BPCL discounted 5,122 invoices valued at ₹ 616 crore during the current year, as against ₹ 318 crore during the previous year 2022-23.

INTERNAL CONTROL SYSTEM AND ITS ADEQUACY

The Company has a robust internal control system (including Internal Financial Controls over Financial Reporting) that facilitates efficiency, reliability and completeness of accounting records and timely preparation of reliable financial and management information. The internal control system ensures compliance with all applicable laws and regulations, facilitates optimum utilization of resources and protects the Company's assets and interests of investors. The Company has a clearly defined organizational structure, well-documented decision rights, as well as detailed manuals and operating procedures for its business units and service entities, to ensure orderly and efficient conduct of its business.

The internal control systems (including Internal Financial Controls over Financial Reporting) are reviewed on an ongoing basis and necessary changes are carried out to align with the changing business/statutory requirements. The Company has implemented role-based authorization to ensure necessary controls in ERP, to have a high degree of data integrity and professional standards. The SAP system provides an inbuilt audit trail for all business transactions that have taken place at any point of time. The Company has a whistle-blower policy and an anti-fraud policy to address fraud risks.

The Company's independent Audit function, consisting of professionally qualified persons from accounting, engineering, IT and marketing domains, reviews the business processes and controls to assess the adequacy of the internal control system through risk-focused audits. The Internal Audit Department plans the annual audit plan to cover various aspects of the business. The audit reports published by the Internal Audit Department are shared with the Statutory/Government Auditors, who review the efficacy of internal financial controls. The Audit Committee/ Board regularly reviews significant findings of the Internal Audit Department, covering operational, financial and other areas and provides guidance on internal controls, to ensure governance commensurate with the operations of the Corporation.

DETAILS OF SIGNIFICANT CHANGES IN KEY FINANCIAL RATIOS

S. No.	Ratio Type	Unit	2023-24	2022-23	Variation (in %)	Explanation for Changes
1	Debtors Turnover Ratio	No. of Days	**5.43**	5.63	-3.52%	
2	Inventory Turnover Ratio	No. of Days	**29.21**	27.52	6.13%	
3	Interest Coverage Ratio (Profit Before Interest and Tax + Depreciation)/ Finance cost	Times	**23.97**	3.99	500.75%	The Interest Coverage Ratio has increased during the current year mainly on account of increase in Profit coupled with decrease in Finance cost
4	Current Ratio	Times	**0.88**	0.77	14.67%	Higher Debt repayment and increase in Equity is due to higher profitability in the current year
5	Debt-Equity Ratio	Times	**0.25**	0.69	-63.58%	
6	Operating Profit Margin Ratio (OPM) OPM = (Profit before Exceptional Items and Tax minus Other Income)/ Sales	%	**6.91**	0.26	2,540.56%	The increase in Operating Profit Margin Ratio is mainly due to increase in the refinery and marketing margins in the current year
7	Net Profit Margin Ratio	%	**5.26**	0.35	1,401.04%	The Net Profit Margin Ratio has increased mainly on account of higher Profit after Tax
8	Return on Net Worth	%	**35.72**	3.60	893.15%	The Return on Net Worth has increased mainly on account of higher Profit after Tax

ANNEXURE TO THE DIRECTORS' REPORT

ANNEXURE-A

Particulars in regard to Conservation of Energy, Technology Absorption and Foreign Exchange Earnings and Outgo pursuant to the Companies (Accounts) Rules, 2014

A. CONSERVATION OF ENERGY

Mumbai Refinery (MR)

(i) Steps taken for impact on conservation of energy

Energy conservation and transition towards Net Zero was a major business goal during the year for BPCL. MR successfully completed various energy conservation initiatives, which were instrumental in achieving Specific Energy Consumption of 60.9 MBN for the financial year. The performance is attributed to sustained operation at higher intake level of energy efficient Crude Distillation Unit-4(CDU-4), higher capacity utilization of secondary process units, energy champion schemes and various energy conserving efforts undertaken during the year. A total of 26 Energy Conservation (ENCON) schemes were implemented, which saved 49,374 MTOE/year and reduced CO_2 emission by 15,528 MT/year. These achievements were possible due to the following steps taken:

- Unit wise daily monitoring of steam leaks to achieve zero steam leaks.
- Continuous monitoring and control of all parameters of Furnaces & Boilers.
- Improvement in preheat, furnace efficiency and operational performance of the CDU-4, Catalytic Cracking Unit (CCU), Fluid Catalytic Cracking Unit (FCCU), Continuous Catalyst Regeneration Unit (CCR) and Gasoline Treating Unit (GTU) during Turnaround 2023.
- Continuous recovery of flare gas with the help of the Flare Gas Recovery System (FGRS) and stringent monitoring of process conditions to control flare loss.
- Continuous Survey of Pressure Safety Valves (PSV)/Pressure Control Valves (PCV) to identify passing valves and rectification to reduce flare loss.
- Periodical Survey of Compressed Air and Nitrogen leaks and rectification.
- Implementation of various Advanced Process Control (APC) strategies in process units to reduce energy consumption.
- Usage of an 'Energy Analytics Dashboard' and 'Unit Daily EII Monitoring' for online monitoring of Refinery Process Performance along with MBN/EII.
- Replacement of conventional cooling tower fan blades in all the cooling towers and various process units with new energy efficient e-Glass Epoxy-Fibre Reinforced Plastic (e-FRP).
- Implementation of Electric Heat Tracing (EHT) in offsite congealing lines.
- De-aerator pressure optimization of the Boiler House De-aerator.

(ii) Steps taken by the Company for utilizing alternate sources of energy

Cumulative solar power generation for 2023-24 was 1,195.884 MWH/Annum from the Solar Power Plant installed at the Refinery & BPCL staff colony in Chembur, Mumbai.

(iii) The capital investment on energy conservation and estimated savings

Sr. No.	Description of Schemes	Capital Investment (₹ crore)	Energy Savings Fuel (MT/Year)	Energy Savings Power (MWh/Year)
1	Stripping steam optimization in C3/C4 Splitter in CCU	NIL	262	
2	DHDS De-aerator pressure optimization	NIL	238	
3	Replacement of one BCW CT fan blade in CPP BCW cooling towers with new generation energy efficient e-FRP blades	0.03		62.3
4	NHGU PSA adsorbent replacement impact	As part of Project Development Report (PDR)	8,533	
5	Boiler House (BH) BFW pump offloading	NIL	300	
6	Tank 116 (VLSFO service) steam to coils isolated for steam savings	NIL	714	

Sr. No.	Description of Schemes	Capital Investment (₹ crore)	Energy Savings Fuel (MT/Year)	Energy Savings Power (MWh/Year)
7	DM water/Pure condensate routing optimization in DHDS/CCR and CDU-3 through NHGU	1.65	952	
8	BH De-aerator pressure optimization	NIL	3,633	
9	Electrical Heat Tracing (EHT) Phase-1 in offsite congealing lines	31.25	4,829	-5,954.0
10	CDU-3 crude column top pressure optimization	NIL	1,000	
11	Tank 117 (VLSFO service) steam to coils isolated for steam savings	NIL	714	
12	Replacement of AFC fan blades in CCR (6) with new generation energy efficient e-FRP blades	0.16		332.4
13	Replacement of fan blades in BCW cooling towers (CPP 2, FCCU 1, GTU 1) with new generation energy efficient e-FRP blades	0.16		205.9
14	Replacement of fan blades in RCW cooling towers (CCR 3, DHT 2) with new generation energy efficient e-FRP blades	0.16		409.3
15	Replacement of fan blades in SCW cooling towers (MOC 4, CDU-4 7, RMP 2) with new generation energy efficient e-FRP blades	0.43		4,542.7
16	CCR revamp	As part of Turnaround	2,200	
17	NHT shutdown impact and feed maximization	As part of Turnaround	733	
18	CDU-4 shutdown initiative impact	As part of Turnaround	11,667	
19	Diversion of VDU hot well gases to flare instead of local venting (isolation of steam-to-steam ring)	As part of Turnaround	48	
20	CCU shutdown initiative impact	As part of Turnaround	4,233	
21	FCCU shutdown initiative impact	As part of Turnaround	2,419	
22	GTU shutdown initiative impact	As part of Turnaround	233	
23	Steam traps & leak management in CDU-4, CCU, FCCU, CCR, GTU, DHDS, ARU units & Utility area (SD jobs)	NIL	1,614	
24	Hot feed to RFU ex-CDU-4	NIL	1,071	
25	CDU-4 crude column top pressure optimization	NIL	2,267	
26	86-P-03 Turbine in DM Plant area offloaded	;NIL	1,786	
	Total	**33.84**	**49,446**	**-401.4**

Kochi Refinery (KR)

(i) Steps taken for impact on conservation of energy

Specific Energy Consumption has reduced to 62.6 MBN at KR. BPCL-KR implemented 22 major Energy Conservation Schemes, having potential savings of 31,345 MTOE/year with potential reduction of CO_2 emission by 97,169 MT/year.

The following were the areas of major improvement:

- Integration of refinery fuel gas system across all blocks to avoid flare loss and minimize fuel oil consumption.
- Maximizing hot feed from CDU-3 to downstream units.
- Delayed Coker Unit (DCU) heater pass modifications.
- Implementation of APC in all Refinery Units, Petrochemical Units and Utilities.
- Use of Nitrogen as stripping medium instead of steam in the Kerosene Hydro De-Sulphurization Unit (KHDS).
- Conversion of air fin cooler fan blades from metallic to e-FRP.
- Impeller modifications and motor replacement for pumps to avoid two pumps operation in parallel due to higher load.

(ii) Steps taken for utilizing alternate sources of energy

- 3.37 MWp Solar plant at Rainwater Harvesting Pond was commissioned in February 2024.
- 6.0 MWp Solar plant at CISF Colony was commissioned in March 2024.
- 3.83 MWp Solar plant at Shore Tank Farm was commissioned in June 2024.

(iii) The capital investment on energy conservation and estimated savings

Sr. No	Description of Schemes	Capital Investment (₹ crore)	Energy Savings Fuel (MT/Year)	Energy Savings Power (MWh/Year)
1	Preheat Improvement in CDU-3 by passing LK and HK re-boiling medium	NIL	3,256	
2	Routing of CDU-3 Hot VGO to the Vacuum Gas Oil Hydro De-Sulphurization (VGOHDS) unit thereby reducing steam heating in the VGOHDS unit	NIL	2,116	
3	DCU heater A & heater B pass headers modification	0.25	1,901	
4	Various APC initiatives implementation in FY 2023-24: 1. PDO LP Oxo section, BuOH and 2EH section 2. UB10 & HRSG for steam reduction 3. KHDS for steam and FG optimization 4. DHDT and VGO HDT Preheat Improvement 5. APC revamp of CDU-2 and FCC units 6. Dynamic SOx limit in DCU and CDU-3 thereby increasing heater efficiencies	NIL	6,324	
5	Installation of sour water coalescer on sour water line in DCU for oil recovery	6.00	999	
6	Cold Flash drum off-gas from VGOHDS routed to NHT-1 reducing H_2 intake and reducing excess Fuel Gas in CEMP-II	NIL	950	
7	Fuel gas connectivity to old Refinery from IREP thereby reducing flaring and reducing fuel oil consumption in refinery	0.28	950	
8	Routing KHDS off gases to Biturox incinerator to avoid flaring: Approx. reduction of 2 TPD of HC gas	0.09	770	
9	Use of Nitrogen as stripping medium instead of steam in KHDS	NIL	729	
10	Routing of excess FG from IREP to CEMP-II to reduce flare loss	0.45	500	
11	Use of improved Catalyst in VGOHDS	NIL	3,906	
12	Use of improved Catalyst in DHDS	NIL	2,604	
13	In DHDT Unit, 55 AFC metallic blades have been replaced with e-FRP blades	0.47		1,704
14	Stopping Fuel Oil circulation in MSBP after fuel gas rationalization scheme implementation	NIL	274	639
15	In PDA unit, replacing small rating motors (P-13A/B and P-17A/B) with higher rating which has helped in running only one pump instead of two parallel pumps	0.35		511
16	In CDU-2 unit, replacing small rating motors (Pumps CP232A&B - RCO Pump) with higher rating and change in impeller diameter has helped in running only one pump instead of two parallel pumps	0.4		1,278
17	Energy conservation initiatives in PDPP: (a) AFC Power optimization in PDO unit (b) Diversion of PDO Recycle compressor purge to FG system	NIL	388	213
18	Energy conservation initiatives in CDU-2: Stopping FO firing in furnaces, direct routing of Raffinate for SBP production, feed pump impeller trimming etc.	0.05	577	2,113
19	Energy Improvement Schemes in CDU-3: Replacing small rating motors (Heavy Naphtha and HVGO pumps) with higher rating which has helped in running only one pump instead of two parallel pumps, bringing CDU-3 heater ID fan in VFD mode	1.53		2,982
20	Reduction in size of steam systems: Stoppage of SCAPH in DHDT, Steam optimization in NHTCCR SCAPH, Removal of redundant lines in SRU-3 and utilities	0.05	1,405	
21	Operational improvements: VGO HDS recycle gas Anti-surge opening reduction, MSBP RGC (MNC01) loading reduction to 50% from 75%, Taken VGO HDS PRT inline, routing of hot lean amine from SRU-3 to VGO HDT thereby stoppage of amine preheater in VGO HDT	NIL	984	2,190
22	Energy conservation initiatives in MSBP: installation of FRIC insulation on hot oil system valves, Routing of condensate to DHDS Utility Boiler De-aerators	0.30	665	
	Total	**10.2**	**29,298**	**11,630**

Bina Refinery (BR)

(i) Steps taken for impact on conservation of energy

BR's Specific Energy Consumption was 66 MBN in 2023-24, as against 67.2 MBN in the previous year. A total of 11 ENCON schemes were implemented, which helped BR save 24,156 MTOE/year and reduce CO_2 emission by 89,071 MT/year.

The following are the measures taken up at BR for energy conservation:

- Steam Network Management and quarterly surveys of flare control valves and PSVs passing by ultrasonic leak detector were continued through external expert agencies.
- Continuous monitoring and control of all parameters of Furnaces & Boilers, continuous recovery of flare gas through the Flare Gas Recovery System, optimization of process unit parameters through APC to sustain energy performance at optimum level.
- Installation of Micro Turbine in SRU MP to LP Let-down with power generating capacity of 2.5 MW.
- Energy efficient blades installed in place of conventional blades in process fin fan coolers for power saving.
- Replacement of conventional lamps with LED lamps for power saving in refinery.
- Refinery Cooling Tower turbine kept on hot standby to reduce CPP PRDS losses.
- CAPH Replacement in HCU Fired heater to reduce fuel consumption.
- Replacement of orifice flowmeter by ultrasonic flow meter in CDU/VDU & DCU.

(ii) Steps taken for utilizing alternate sources of energy

- 14MWp Solar Power project commissioned in August 2023 as a part of our Net Zero initiative.
- Setting up a 2.15 MT/day Green Hydrogen plant utilizing 5 MW electrolyzer, engineering work for the same is under progress.

(iii) The capital investment on energy conservation and estimated savings

S.N.	Description of Schemes	Capital Investment (₹ crore)	Energy saving: Fuel (MT/year)	Energy saving: Power (MWh/Year)
1	14MWp Solar Power plant	91.68		25,760
2	Installation of Micro Turbine in SRU MP to LP Let-down with power generator	12.14		9,600
3	Replacement of conventional lamps with LED lamps	5.86		3,490
4	Energy efficient FRP blades in AFCs of Refinery process units	2.56		6,013
5	RCT turbine on hot standby to reduce CPP PRDS losses	NIL		9,760
6	Stopping the standby seal pot blower in Boiler-2 achieved through pulley resizing of seal pot blowers	NIL		160
7	VGO Pump impeller trimming to save power	NIL		200
8	CAPH Replacement in HCU Fired Heater to reduce fuel consumption	NIL	685	
9	Replacement of orifice flowmeter by ultrasonic flow meter in CDU/VDU & DCU (9)	NIL	261	
10	ARU and SWS Reboiler steam reduction by 10 TPH by cleaning of tube bundle	NIL	7,143	
11	Installation of new globe valves in STG LP extraction header which will facilitate LP steam optimization and increase waste heat recovery in HGU unit	NIL	3,571	
	Total	**112.24**	**11,660**	**54,983**

B. TECHNOLOGY ABSORPTION

Mumbai Refinery (MR)

i) The efforts made towards technology absorption and the benefits derived such as product improvement, cost reduction, product development or import substitution:

- MR successfully produced Group III 100N Base Oil.
- MR received a US patent for 'Advanced Process Control in a Continuous Catalytic Regeneration Reformer' in May 2023, after receiving the Indian patent in May 2019.
- A new product, De-aromatized Solvent D40/D100/D130 grade, was dispatched for the first time from MR.

ii) In case of imported technology (imported during last three years reckoned from the beginning of the financial year):

a. The details of technology imported and the year of import:

S.No	Unit – Technology	Licensor	Year
1	Lube Oil Base Stock (LOBS) Revamp (300 to 450 KTPA)	M/s. CLG, USA	2022
2	Kerosene Hydrotreater (KHT)	M/s. Haldor Topsoe, Denmark	2023

b. Has technology been fully absorbed?

Yes.

c. If not absorbed, areas where this has not taken place, reasons thereof and future plans of action.

Not Applicable.

Kochi Refinery (KR)

i) The efforts made towards technology absorption and the benefits derived such as product improvement, cost reduction, product development or import substitution:

a) Heavy Oxo Alcohol, a new product was added to the KR product portfolio.

b) In collaboration with CRDC, KR completed the trial run and produced Green Anode grade coke in the Delayed Coker unit.

c) The Environment Protection Agency (EPA) USA grade Diesel trial run was completed successfully in the VGOHDS Unit on February 1, 2024. Discussions are on with potential customers and delivery of product is being worked out.

d) Merox upgradation to treat feed with mercaptans up to 400 ppm from the existing 250 ppm was successfully completed in September 2023.

e) In order to resolve the persistent moisture issue in KHDS products, Nitrogen stripping was provided to the KHDS Fractionator (KV-3) bottom (in place of steam) in May 2023, eliminating the issue effectively.

ii) In case of imported technology (imported during the last three years reckoned from the beginning of the financial year):

No technology has been imported during the last three years.

Bina Refinery (BR)

i) The efforts made towards technology absorption and the benefits derived such as product improvement, cost reduction, product development or import substitution:

BR has made efforts in implementing the following to obtain the benefits of the latest technology developments and advances during 2023-24:

- BR has broadened its range of products by introducing Army Grade Kerosene, which is characterized by Low Smoke and Low Aromatic content, and Ethanol Blended Motor Gasoline (EBMS) to its selection. These additions reflect the refinery's ongoing efforts to diversify and enhance its product offerings.
- BR has taken a significant step towards improving Sulfur recovery by loading an indigenous catalyst into the Tail Gas Treating Unit (TGTU) reactor. This move, not only supports domestic industries, but also showcases the refinery's commitment to adopting locally-sourced, high-quality solutions for its operations.
- The installation of electrical tracing in the Cyclemax (Continuous Catalyst Regeneration) Unit's upper air line is an enhancement to prevent corrosion caused by HCl condenzation. This upgrade has significantly improved the system's reliability, ensuring more consistent and secure operations within the refinery.
- BR has enhanced its operational reliability by installing online analyzers for Iron (Fe), Chloride (Cl), and pH in the CDU. These analyzers facilitate real-time monitoring of key corrosion parameters, forming an integral part of the Comprehensive Chemical Treatment Program.

ii) In case of imported technology (imported during last three years reckoned from the beginning of the financial year):

No technology has been imported during the last three years.

RESEARCH & DEVELOPMENT (R&D)

(i) Specific area in which R&D has been carried out:

1. Green Hydrogen.
2. Carbon dioxide (CO_2) capture & utilization
3. High Efficiency Domestic Petroleum Natural Gas (PNG) Cooking Stove
4. Integrated solar and wind energy generation and storage system
5. Super Absorbing Polymer (SAP) commercialization
6. Niche petrochemicals and Petrochemical processes
7. Di-methyl Ether Demonstration
8. Development of Polyacrylic acid-based additives for industrial water treatment
9. Green Silica production from Biorefinery waste
10. Biodegradable plastics production
11. Bio-methanation using biomass feedstock
12. Sustainable Aviation Fuel (SAF)/Bio-ATF (Aviation Turbine Fuel)
13. Diesel-Ethanol Blends for Automotive Applications
14. EPA grade Diesel production process
15. JP-7 grade Aviation Fuel
16. Membrane based Hydrogen recovery from refinery off-gases
17. HiGee Technology for deaeration of Boiler Feed Water
18. Novel reactor designs
19. Indigenous Desalter technology
20. Process Intensification/Energy efficient processes

21. Energy Efficient Furnace and Heat Exchanger operation
22. Software for real-time Crude Assay for crude distillation monitoring and optimization
23. Software for predicting crude blend compatibility and optimization
24. Simulation models for refinery units
25. Niche/Specialty Solvent development
26. Niche Catalyst development and catalytic processes
27. Crude Oil Pipeline Corrosion Inhibitor development
28. Anode grade Coke production process
29. Waste Plastic usage in road construction
30. Biofuel compatible Engine Oils
31. Universal Tractor Transmission Oil developed for high horsepower tractors
32. Fully synthetic Air Compressor Oil for severe duty Reciprocating compressors
33. Single phase synthetic immersion coolant for data center servers
34. Non-staining Hydraulic oil for the Aluminum industry

(ii) Benefits derived as a result of the above R&D

1. Corporate Research and Development Center (CRDC) has developed the world's most energy efficient LPG stove with thermal efficiency of >74%. So far 1.7 lakh units have been sold with net revenue generation of ₹ 3.5 crore through royalty.
2. Indigenously manufactured Super Absorbent Polymer (SAP) product has been certified by M/s. Swara Baby Products Pvt. Ltd. and M/s. Bapuji for diapers and other industrial applications. Based on the certification, the clients have placed an order for a supply of 4 MT of SAP.
3. A 2,500 MT per day HiGee deaerator system is being installed at KR in collaboration with M/s. Engineers India Limited (EIL). This will result in steam saving worth ₹ 2.3 crore per annum.
4. Russian crude processing using the K Model in Bina Refinery yielded ₹ 82 crore benefit by averting compatibility/fouling issues and selecting compatible crudes.
5. At India Energy Week, CRDC showcased and demonstrated an indigenous alkaline electrolyzer, jointly developed with BARC, for Green Hydrogen production. Hon'ble Prime Minister, Shri Narendra Modi and MoPNG Minister, Shri Hardeep Singh Puri appreciated the Company's efforts towards Hydrogen economy and Atmanirbhar Bharat initiatives.
6. CRDC and EIL collaborated to develop desalter technology, deployed at KR CDU III unit's first stage desalter. Post-implementation, efficiency increased by 1% with low salt range crude oils and 4–6% with higher salt range crude oils.
7. A 6,500 MT green anode grade coke production trial at KR was successfully completed in November 2023. The product met the requisite specifications and can be manufactured viably on a continuous basis.
8. In-house formulated process chemicals for furnace and heat exchanger cleaning, as well as sulfur pit deodorization, resulted in savings of ₹ 1.75 crore.
9. SBU support activities towards catalyst and additive evaluation, corrosion sample analyses, BPMARRK software usage, crude and fuel testing led to a value addition of ₹ 13.96 crore.

(iii) Future R&D areas

1. Net Zero processes and technologies
2. Hydrogen Carriers
3. Pathways to a Circular Economy
4. Renewable and Alternate Energy
5. Bio-Products/Bio-chemicals
6. Battery and Storage technologies
7. Graphene production
8. Engine R&D
9. Waste to energy and fuels
10. Crude to Chemicals
11. Electrochemical CO_2 reduction processes
12. Photocatalytic conversion of CO_2
13. E-fuels
14. Strategy to handle Petrochemical plant effluents
15. Residue upgradation to value added Chemicals and products
16. Niche Petrochemical product development

(iv) Expenditure on R&D during 2023-24

Particulars	Expenditure (₹ in crore)
Revenue/Recurring Expenditure	58.52
Capital Expenditure	37.35
Total	**95.87**

C. FOREIGN EXCHANGE EARNINGS AND OUTGO

The details of foreign exchange earnings and outgo are given below:

(₹ in crore)

Particulars	2023-24	2022-23
Earnings in Foreign Exchange - Includes receipt of **₹ 1,857.39 crore** (previous year ₹ 1,917.63 crore) in Indian currency out of total foreign currency billings made to foreign airlines and **₹ 602.05 crore** (previous year ₹ 507.13 crore) of INR exports to Nepal and Bhutan of I&C, Lubes and Retail customers	**13,011.82**	15,708.29
Foreign Exchange Outgo - On account of purchase of Raw Materials, Capital Goods, Chemicals, Catalysts, Stores spares, International trading activities etc.	**2,06,913.77**	2,31,848.17