FIPI

POLICY & ECONOMIC REPORT

OIL & GAS MARKET

October 2024

Table of Contents

List of Figures & Tables

Executive Summary

According to IMF, the global economy has remained resilient throughout the disinflationary process, avoiding a global recession. Growth is projected to hold steady at 3.2 percent in 2024 and 2025, even though low-income developing countries have seen sizable downside growth revisions, as a result of increased regional conflicts.

Global growth is expected to remain broadly flat— decelerating from 3.3 percent in 2023 to 3.1 percent by 2029, growth in advanced economies markedly slowed in 2023 and is projected to remain steady, oscillating between 1.7 and 1.8 percent until 2029. In the United States, projected growth for 2024 has been revised upward to 2.8 percent, on account of stronger outturns in consumption and nonresidential investment. In the euro area, GDP growth is expected to pick up to a modest 0.8 percent in 2024 as a result of better export performance of goods. In 2025, growth is projected to rise further to 1.2 percent, helped by stronger domestic demand.

Emerging Asia's strong growth is expected to subside, from 5.7 percent in 2023 to 5.0 percent in 2025. In India, the outlook is for GDP growth to moderate from 8.2 percent in 2023 to 7 percent in 2024 and 6.5 percent in 2025, because pent-up demand accumulated during the pandemic has been exhausted, as the economy reconnects with its potential.

In case of India, according to RBI, real GDP growth is expected at 7.2 per cent in 2024-25 with 7.0 per cent in Q2; 7.4 per cent both in Q3 and Q4. For 2025-26, assuming a normal monsoon and no major exogenous or policy shocks, real GDP growth is estimated at 7.1 per cent, with Q1 at 7.3 per cent, Q2 at 7.2 per cent, Q3 and Q4 both at 7.0 per cent.

The growth is attributed to robust government capex and revival in private investment; improved prospects of agricultural sector due to favorable monsoon rainfall; strengthening manufacturing and services sector activity sustained by strong domestic demand; retreating global and domestic inflation.

However, despite the above growth momentum, challenges stand in terms of escalation in geopolitical tensions; volatility in international financial markets and geoeconomic fragmentation; deceleration in global demand; along with supply chain disruptions.

Headline consumer price index (CPI) inflation moderated to 4.4 per cent in April-August 2024 from 5.2 per cent in H2:2023-24. Food price inflation, on the other hand, remained elevated, averaging 6.9 per cent over the last five months (April-August 2024) and contributing 72.5 per cent of headline inflation during the period. With domestic economic activity strengthening, and pick-up in southwest monsoon rainfall, the Monetary Policy Committee decided to keep the policy repo rate unchanged at 6.5 per cent while retaining the stance of withdrawal of accommodation. Further, year-on-year inflation rate based on All India Consumer Price Index (CPI) for the month of September, 2024 is 5.49%. Corresponding inflation rates for rural and urban are 5.87% and 5.05%, respectively.

The headline HSBC Flash India Composite Output Index – a seasonally adjusted index that measures the month on-month change in the combined output of India's manufacturing and service sectors – rose to 58.6 this month from September's final reading of 58.3, which was a 10-month low.

Growth in new orders and new export order led to this growth in October 2024, thereby improving business confidence. The HSBC Flash India Manufacturing PMI – a single-figure snapshot of factory business conditions calculated from measures of new orders, output, employment, supplier delivery times and stocks of purchases – posted 57.4 in October as against 56.7 in September. The reading signaled a further marked strengthening in business conditions for goods producers. The services industry reading rose slightly to 57.9 this month from 57.7 in September 2024.

On the external front, India's forex reserves stand at $ 690 billion as of 11th October, 2024 according to RBI. According to the Weekly Statistical Supplement released by the RBI, foreign currency assets (FCAs) fell by $10.5 billion to $602 billion. Gold reserves decreased by $98 million, bringing the total down to $65.6 billion. The Special Drawing Rights (SDRs) dipped by $86 million, now totaling $18.3 billion, while the reserve position in the International Monetary Fund (IMF) contracted by $20 million, now standing at $4.3 billion.

As far as oil and gas industry is concerned, Benchmark oil prices bounced sharply higher in early October, as potential oil supply risks once again took centre stage. Escalating tensions between Israel and Iran are fuelling fears of a broader Middle East conflict and disruptions to Iranian exports. However, a resolution to a political dispute in Libya, which temporarily halved its oil exports, along with relatively modest production losses from major hurricanes in the US Gulf Coast and weak end-user demand, have contributed to stabilizing markets.

Hedge funds and other money managers continued to be bearish on oil futures in September. This fuelled volatility and accelerated the decline in oil futures prices. Similarly in petroleum products, speculators turned net bearish on gasoil/diesel in both US and European markets. Between the weeks of 27 August and 10 September, speculators sold an equivalent of 174 mb of oil in ICE Brent and NYMEX WTI futures and options.

The sweet-sour crude differentials showed mixed movement among regions. In Europe and Asia, the spread contracted due to a softening of market fundamentals for light sweet crude, primarily driven by slowing demand during the maintenance season and the high availability of light sweet crude in the Atlantic Basin, including increased US crude exports. A decline in gasoline crack spreads in all refining hubs also weighed on the value of light sweet crude. However, the value of medium sour crudes experienced a smaller decline compared to light sweet crudes. In the US Gulf Coast (USGC), the sweet-sour crude spread widened slightly.

Natural gas spot prices at the US Henry Hub benchmark averaged $2.28 per million British thermal units (MMBtu) in September 2024. Henry Hub's natural gas prices rebounded in September after two consecutive months of decreases, up by 13.1%, m-o-m. Prices rallied on the back of supply disruptions in the Gulf of Mexico amid the hurricane season. They were further supported by higher US LNG exports to Asia ahead of the winter demand season. Higher price differentials in Asia compared with Europe’s prices supported more US LNG volumes heading to Asia. Prices were down by ~14%, y-o-y.

Economy in Focus

1. A snapshot of the global economy

Global economic growth

- According to IMF, the global economy has remained resilient throughout the disinflationary process, avoiding a global recession. Growth is projected to hold steady at 3.2 percent in 2024 and 2025, even though low-income developing countries have seen sizable downside growth revisions, as a result of increased regional conflicts.

- Global growth is expected to remain broadly flat— decelerating from 3.3 percent in 2023 to 3.1 percent by 2029, growth in advanced economies markedly slowed in 2023 and is projected to remain steady, oscillating between 1.7 and 1.8 percent until 2029.

    - In the United States, projected growth for 2024 has been revised upward to 2.8 percent, on account of stronger outturns in consumption and nonresidential investment. Growth is anticipated to slow to 2.2 percent in 2025 as fiscal policy is gradually tightened and a cooling labor market slows consumption.

    - In the euro area, GDP growth is expected to pick up to a modest 0.8 percent in 2024 as a result of better export performance of goods. In 2025, growth is projected to rise further to 1.2 percent, helped by stronger domestic demand.

Figure 1: Global growth projections (real GDP growth, % change)

Source- IMF

Figure 2: World Economic Outlook Projections (real GDP growth, annual & change)

	2023	2024	2025
World Output	3.3	3.2	3.2
Advanced Economies	1.7	1.8	1.8
United States	2.9	2.8	2.2
Euro Area	0.4	0.8	1.2
Germany	-0.3	0.0	0.8
France	1.1	1.1	1.1
Italy	0.7	0.7	0.8
Spain	2.7	2.9	2.1
Japan	1.7	0.3	1.1
United Kingdom	0.3	1.1	1.5
Canada	1.2	1.3	2.4
Other Advanced Economies	1.8	2.1	2.2
Emerging Market and Developing Economies	4.4	4.2	4.2
Emerging and Developing Asia	5.7	5.3	5.0
China	5.2	4.8	4.5
India	8.2	7.0	6.5
Emerging and Developing Europe	3.3	3.2	2.2
Russia	3.6	3.6	1.3
Latin America and the Caribbean	2.2	2.1	2.5
Brazil	2.9	3.0	2.2
Mexico	3.2	1.5	1.3
Middle East and Central Asia	2.1	2.4	3.9
Saudi Arabia	-0.8	1.5	4.6
Sub-Saharan Africa	3.6	3.6	4.2
Nigeria	2.9	2.9	3.2
South Africa	0.7	1.1	1.5
Emerging Market and Middle-Income Economies	4.4	4.2	4.2
Low-Income Developing Countries	4.1	4.0	4.7

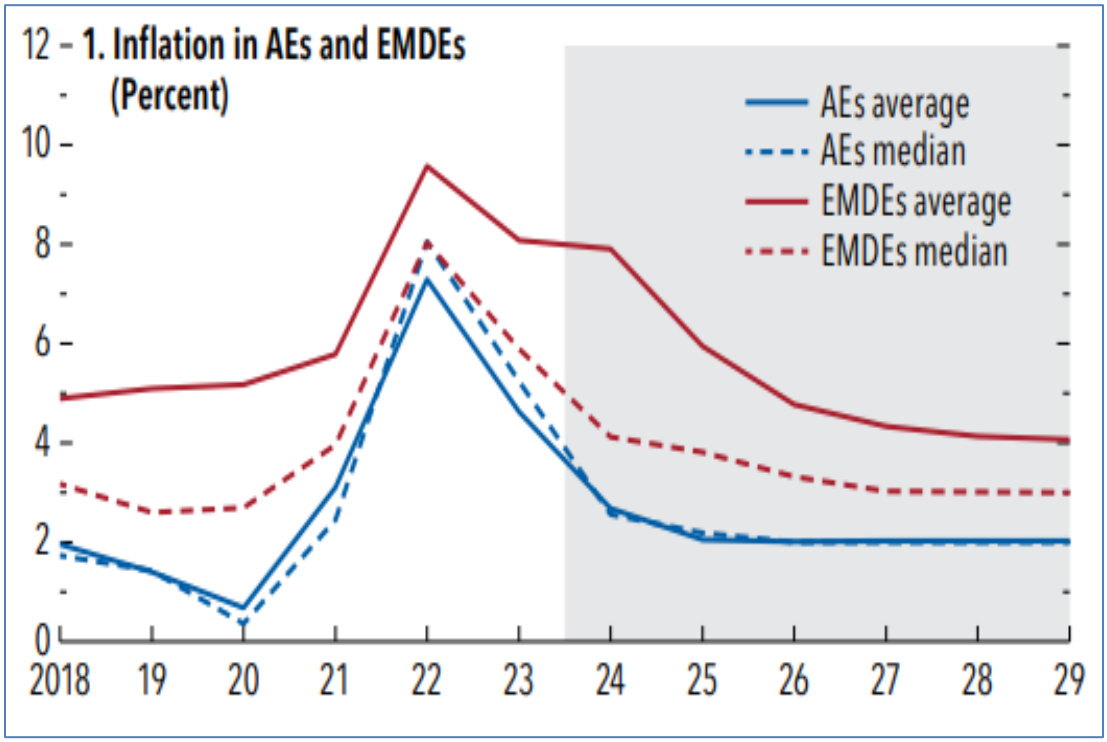
Source- IMF

- The growth outlook for emerging market and developing economies is remarkably stable for the next two years, hovering at about 4.2 percent and steadying at 3.9 percent by 2029.
    - Emerging Asia's strong growth is expected to subside, from 5.7 percent in 2023 to 5.0 percent in 2025. In India, the outlook is for GDP growth to moderate from 8.2 percent in 2023 to 7 percent in 2024 and 6.5 percent in 2025, because pent-up demand accumulated during the pandemic has been exhausted, as the economy reconnects with its potential.
    - In China, the slowdown is projected to be more gradual. Despite persisting weakness in the real estate sector and low consumer confidence, growth is projected to have slowed only marginally to 4.8 percent in 2024.
- In sub-Saharan Africa, GDP growth is projected to increase from an estimated 3.6 percent in 2023 to 4.2 percent in 2025, as the adverse impacts of prior weather shocks abate and supply constraints gradually ease.
- In Latin America and the Caribbean, growth is projected to decline from 2.2 percent in 2023 to 2.1 percent in 2024 before rebounding to 2.5 percent in 2025. In Brazil, growth is projected at 3.0 percent in 2024 and 2.2 percent in 2025.

Global Inflation

- According to IMF, global headline inflation is projected to decrease from an average of 6.7 percent in 2023 to 5.8 percent in 2024 and 4.3 percent in 2025.
- Disinflation is expected to be faster in advanced economies—with a decline of 2 percentage points from 2023 to 2024 and a stabilization at about 2 percent in 2025. Inflation in emerging Asia is projected to be on par with that in advanced economies, at 2.1 percent in 2024 and 2.7 percent in 2025, mainly due to early monetary tightening and price controls in many countries in the region
- In emerging market and developing economies, inflation is projected to decline from 8.1 percent in 2023 to 7.9 percent in 2024 and then fall at a faster pace in 2025 to 5.9 percent. This is mainly on account of large outliers amid pass-through of past currency depreciation and underperformance in agriculture.
- With decelerating inflation, many Central banks have cut down the policy rates to ensure smooth economic activity and restore consumer confidence.

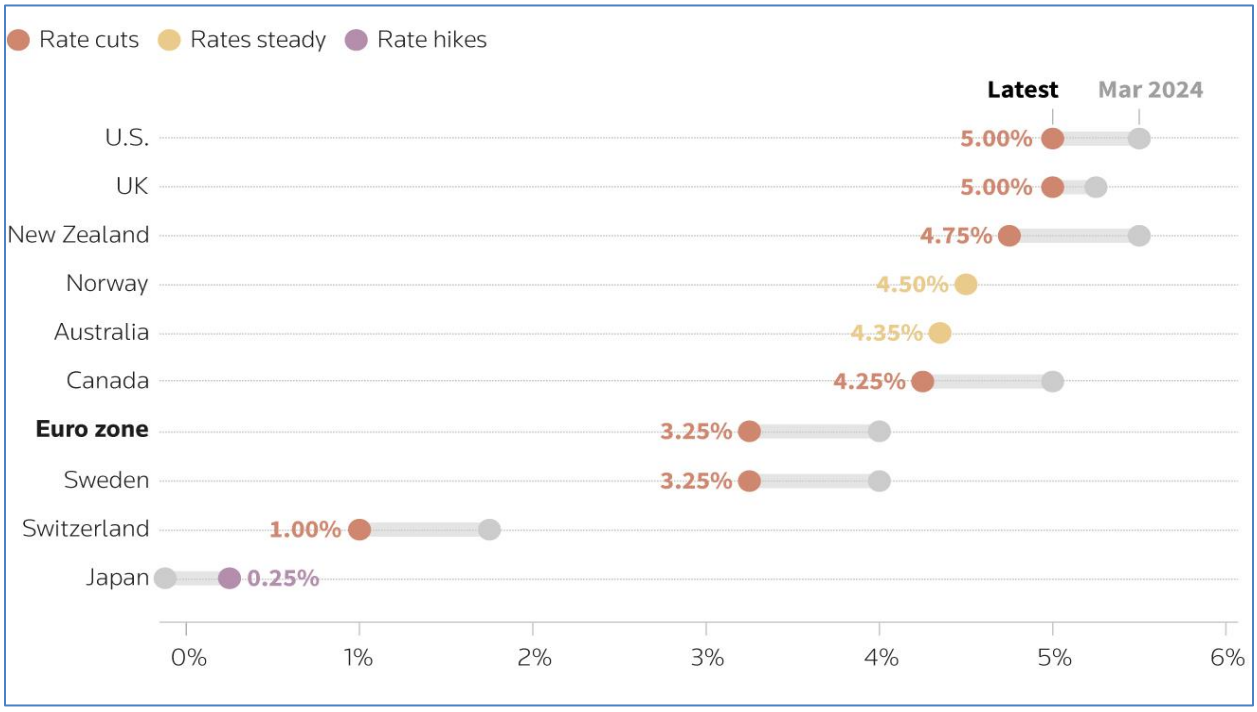
Figure 3: Inflation Outlook



Source- IMF

Central banks stance globally on interest rates to curb inflation

Figure 4: Change in policy rates by central banks globally



Source- Reuters

Global PMI

- The J.P.Morgan Global PMI Composite Output Index - produced by S&P Global - registered 52.0 in September 2024, down from 52.8 in August 2024. The latest reading indicated that growth unfolded at the slowest pace since January and is broadly indicative of the deceleration in the global GDP growth rate.

- The latest global economic expansion remained uneven with the service sector driving growth while manufacturing output fell for the first time since last December. A deepening of the demand downturn in the manufacturing sector was attributed partly to falling trade flows. By region, production fell mainly among firms in developed economies, though emerging market manufacturing output growth also slowed to the softest in nearly a year and was only marginal.

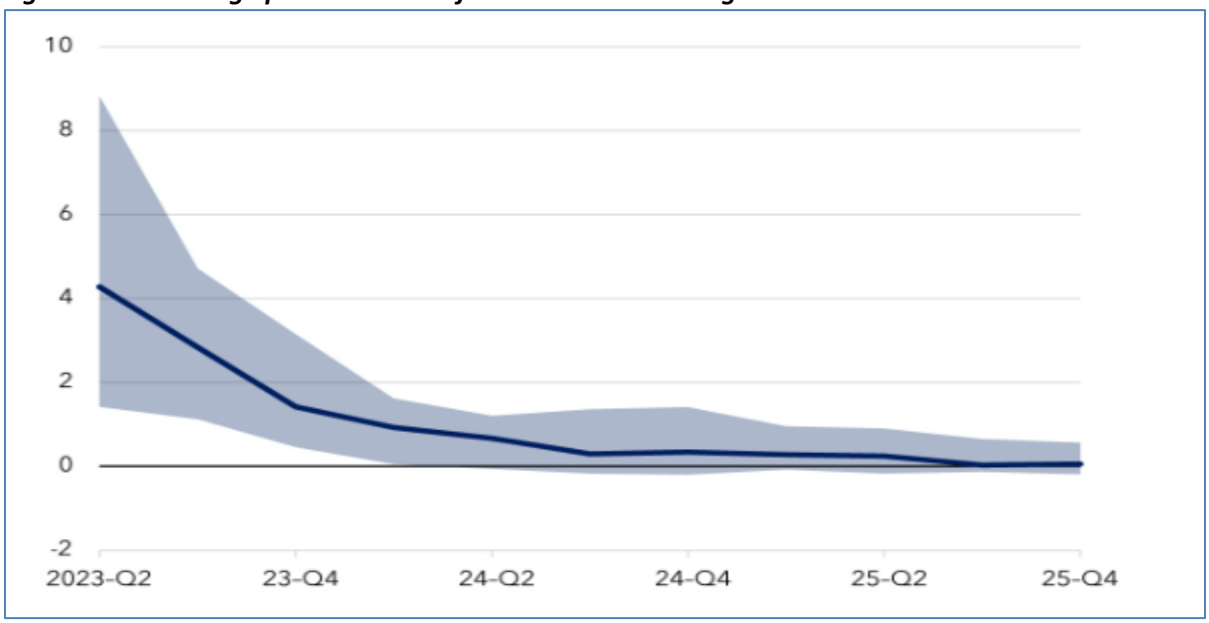
Figure 5: Global economic growth and the PMI

Source- S&P Global

2. As inflation recedes, global economy needs policy triple pivot – IMF

Inflation after peaking at 9.4 percent year-on-year in the third quarter of 2022, will fall to 3.5 percent by the end of next year, slightly below the average during the two decades before the pandemic. In most countries, inflation is now hovering close to central bank targets, paving the way for monetary easing across major central banks.

Figure 6: Percentage point deviation from Central Bank target

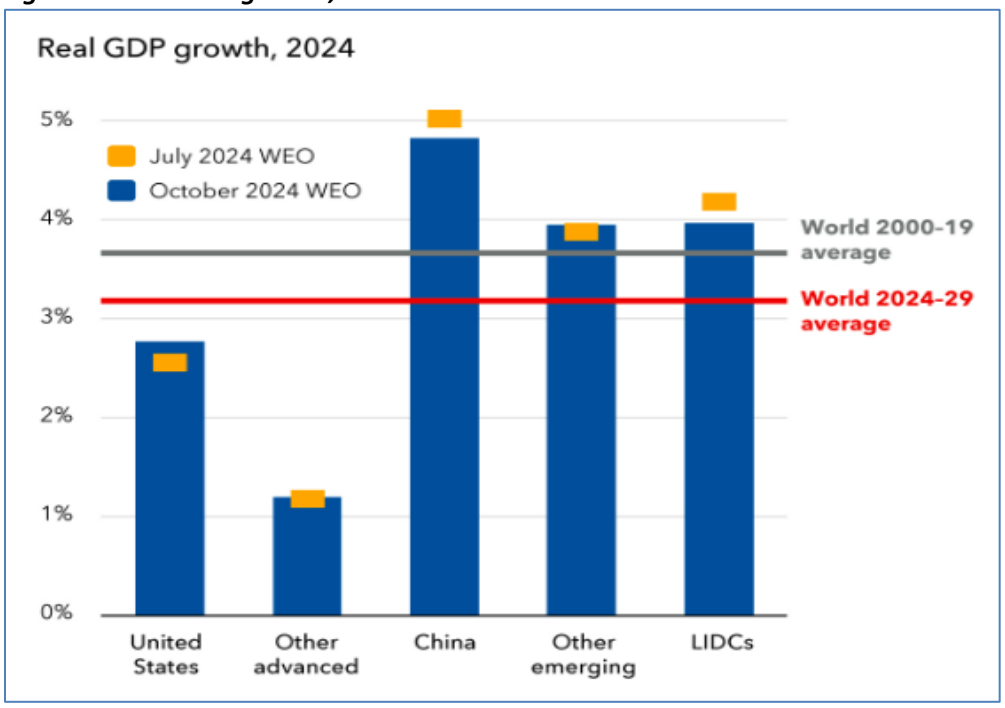


Source- IMF

The global economy remained unusually resilient throughout the disinflationary process. Growth is projected to hold steady at 3.2 percent in 2024 and 2025, but some low-income and developing economies have seen sizable downside growth revisions, often tied to intensifying conflicts.

Much of the disinflation can be attributed to the unwinding of the shocks themselves, together with improvements in labor supply, often linked to increased immigration. But monetary policy played a decisive role by keeping inflation expectations anchored, avoiding deleterious wage-price spirals.

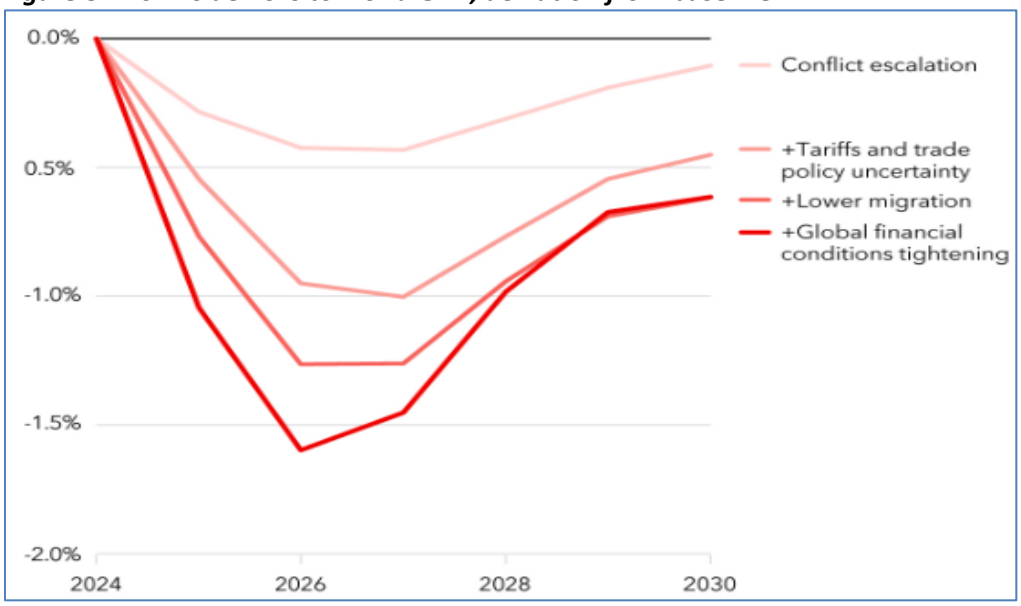
Figure 7: Real GDP growth, 2024



Source- IMF: Abbreviation - World Economic Outlook (WEO)

However, an escalation in regional conflicts, especially in the Middle East, could pose serious risks for commodity markets. Shifts toward undesirable trade and industrial policies can significantly lower output relative to baseline forecast of IMF. Monetary policy could remain too tight for too long, and global financial conditions could tighten abruptly.

Figure 8: Downside risks to world GDP, deviation from baseline



Source- IMF

The return of inflation near central bank targets paves the way for a policy triple pivot.

- The first pivot—on monetary policy—is under way already. Since June, major central banks in advanced economies have started to cut policy rates, moving toward a neutral stance. This will support activity at a time when many advanced economies' labor markets are showing signs of cooling, with rising unemployment rates.

- The second pivot is on fiscal policy. Fiscal space is a cornerstone of macroeconomic and financial stability. After years of loose fiscal policy in many countries, it is now time to stabilize debt dynamics and rebuild much-needed fiscal buffers.

- The third pivot is towards growth-enhancing reforms. Much more needs to be done to improve growth prospects and lift productivity. Focus should be on rebuilding fiscal buffers; coping with aging and shrinking populations in many parts of the world; tackling the climate transition; increasing resilience, and improving the lives of the most vulnerable, within and across countries.

3. Asia: Shipping capacity remains strong despite global shocks

According to Review of Maritime Transport released on 22nd October, 2024, Asia, with the strength of its maritime transport sector, is still the region best-connected to global shipping networks. The report shows Asian economies retaining top spots on the global Liner Shipping Connectivity Index, with China coming out on top, followed by the Republic of Korea and Singapore. Vietnam has recorded the highest long-term increase of 199% in connectivity since 2006.

The index first introduced in 2004 was computed by UN Trade and Development (UNCTAD). It is based on main components of the maritime transport sector such as ship sizes, deployed capacity, numbers of service providers and weekly calls. Looking at shipping building, China, Japan, and the Republic of Korea continue their dominance, accounting for about 95% of global output. For the first time, China delivered over half of the world's new ships in 2023.

Global trade routes disruptions pose challenges to Asia

In an increasingly interconnected world, geopolitical tensions and impacts of climate change have global repercussions, including in Asia. Conflict in the Red Sea has severely affected shipping through the Suez Canal and exacerbated congestion in major ports elsewhere in Asia. Between March and May 2024, waiting times in Singapore nearly doubled from 24 to 40 hours, while in Port Klang, Malaysia, the number went up from 20 to 26 hours. Faced with low water levels linked to climate-induced droughts, draft restrictions in the Panama Canal in 2023 led to shipment delays and higher costs. This has impacted trade routes exporting grains and minor bulk commodities from the Americas to Asia, with a 31% increase in sailing distances for completed journeys and a 25% decrease in cargo volume.

Asia as an engine of merchandise trade, 80% of which is transported by sea

The report shows that in 2023, main maritime waterways connecting the East and West accounted for at least 36% of global containerized trade. These include routes from East Asia to North America, Northern Europe, and the Mediterranean. On the other hand, South-South routes linking the developing world of East and Western Asia, Oceania, Sub-Saharan Africa, and Latin America, achieved the highest increase (+9.3%) in its volume of global containerized trade in 2023.

By sector, technology exports from Asia – most notably green energy and artificial intelligence-related products – are expected to drive further recovery in global merchandise trade. Iron ore trade will continue to grow, given a firm demand from steel producers, particularly in Asia. Global gas trade is also projected to increase, considering expanding infrastructure for the storage and transport of liquefied natural gas, as well as rising demand from Asia and Europe.

4. Global Public Debt on rise- IMF

Global debt is expected to exceed $100 trillion, or about 93 percent of global Gross Domestic Product by the end of this year and will approach 100 percent of GDP by 2030. This is 10 percentage points of GDP above 2019, that is, before the pandemic.

The fiscal outlook of many countries might be worse than expected for three reasons: large spending pressures, optimism bias of debt projections, and sizable unidentified debt.

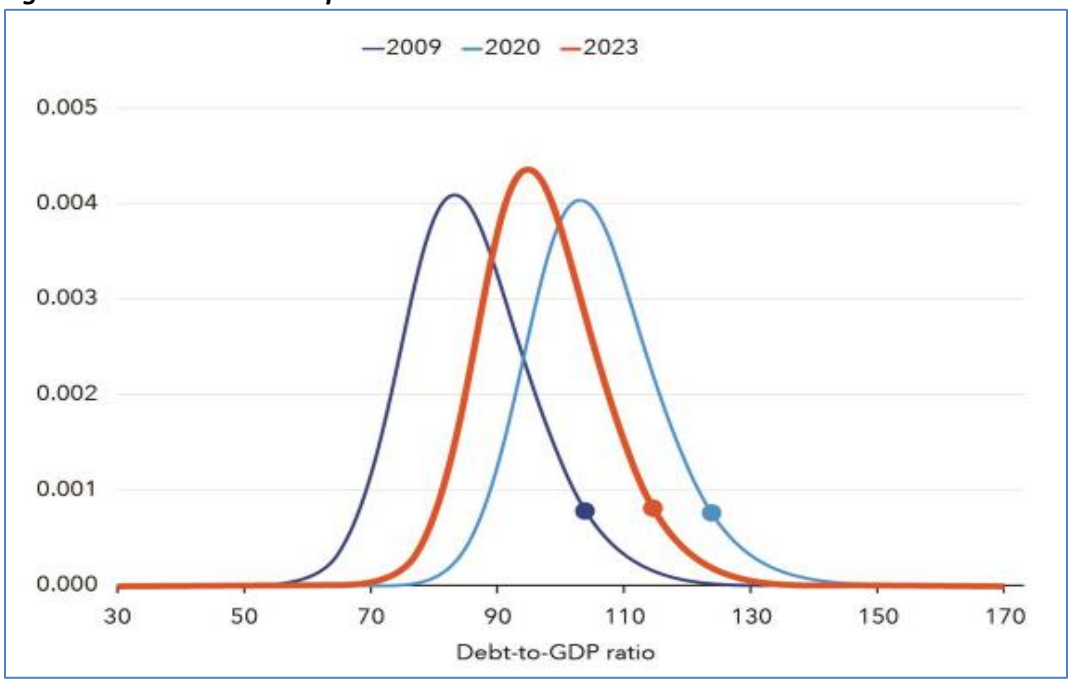
- The fiscal discourse across the political spectrum has increasingly tilted towards higher spending. Countries have focussed to increasingly spend more to cope with aging and healthcare; with the green transition and climate adaptation; and with defence and energy security, due to growing geopolitical tensions.

- On the other side, experience suggests that debt projections tend to underestimate actual outcomes by a sizable margin. Realized debt-to-GDP ratios five-years ahead can be 10 percentage points of GDP higher than projected on average.

  According to IMF, a severely adverse scenario global public debt could reach 115 percent of GDP in three years—nearly 20 percentage points higher than currently projected. This could be due to several reasons: weaker growth, tighter financing conditions, fiscal slippages, and greater economic and policy uncertainty.

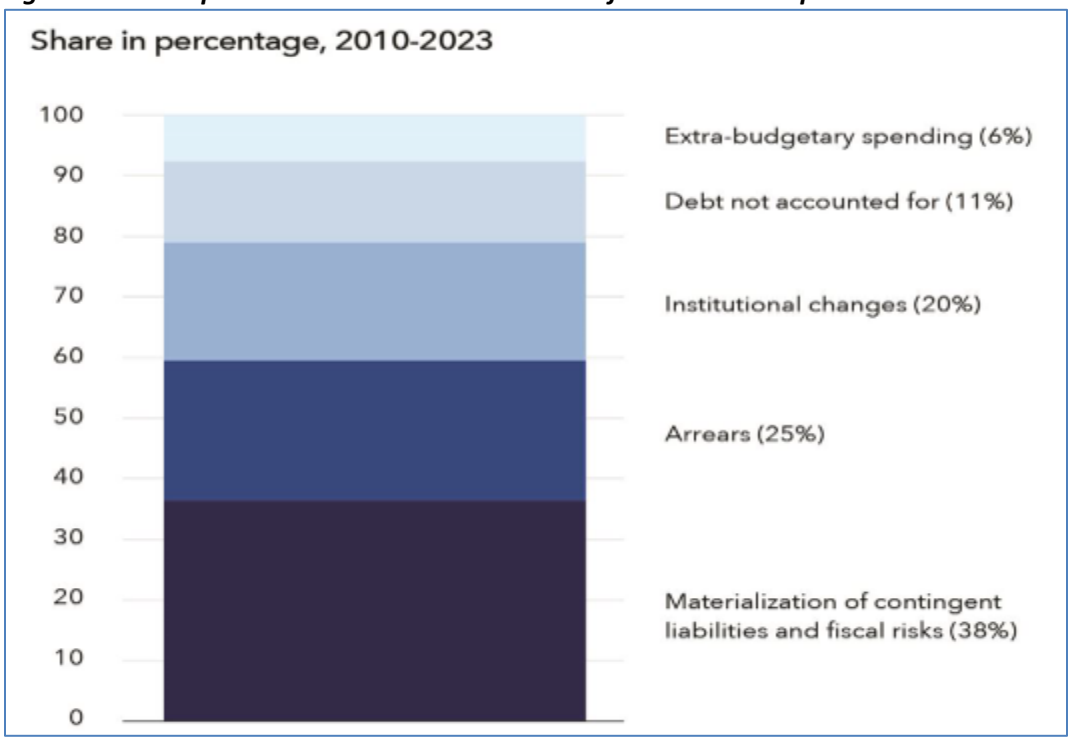
- Sizable unidentified debt is another reason for public debt to end up being significantly higher than projected. An analysis of more than 30 countries finds that 40 percent of unidentified debt stems from contingent liabilities and fiscal risks governments face, of which most are related to losses in state-owned enterprises. Historically, unidentified debt has been large, ranging from 1 to 1.5 percent of GDP on average, and it increases sharply during periods of financial stress.

Figure 9: Elevated risks to public debt



Source- IMF

Figure 10: Multiple sources contribute to unidentified debt buildup



Source- IMF

Fiscal adjustment plays a crucial role in containing debt risks. With inflation moderating and central banks lowering policy rates, economies are better positioned now to absorb the economic effects of fiscal tightening. Delaying would be both costly and risky, as the required correction grows as time goes by; and experience shows that high debt and lack of credible fiscal plans can trigger adverse market reaction.

According to IMF, a cumulative tightening of about 3.8 percent of GDP over the same period would be needed for an average economy to ensure a high likelihood of debt stabilization. In countries where debt is not projected to stabilize, such as China and the United States, the required effort is substantially greater.

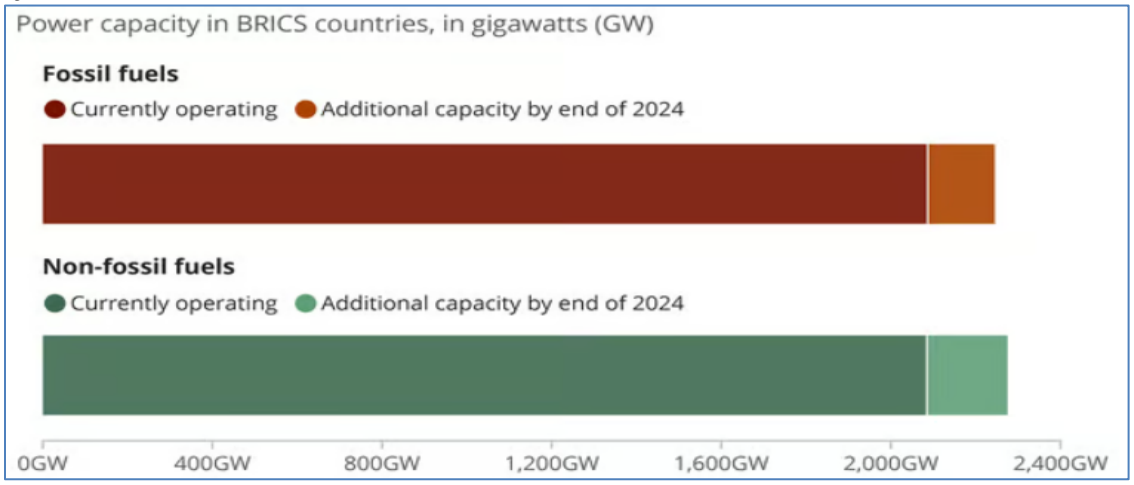
Therefore, growth-focused fiscal measures are needed which will vary across countries. Advanced economies should advance entitlement reforms, reprioritize expenditures, and increase revenues where taxation is low. Emerging market and developing economies have greater potential to mobilize tax revenues—by broadening tax bases and enhancing revenue administration capacity—while strengthening social safety nets and safeguarding public investment to support long-term growth.

5. BRICS nations hit clean energy milestone: Fossil fuels to drop under 50% by end of 2024 for first time

The BRICS nations are poised to see fossil fuel capacity drop below half of their installed power capacity by the end of 2024 in a major shift towards cleaner energy, according to a new report by Global Energy Monitor (GEM).

The BRICS group — originally formed by Brazil, Russia, India, China, and South Africa and recently expanded to include Iran, the United Arab Emirates, Ethiopia, and Egypt — is home to half of the world's population and responsible for a third of global gross domestic product (GDP) and carbon dioxide emissions. Despite their historical reliance on fossil fuels, particularly coal, the new data reflects a rapid pivot towards renewable energy across these nations.

Figure 11: Fossil fuels to lose majority share of total power to cleaner sources in BRICS countries by end of 2024



Source- Global Energy Monitor, IRENA

This year, 190 gigawatts (GW) of non-fossil power capacity, primarily wind and solar, have already been added across China, India and Brazil, the GEM report highlighted. This surge contrasts sharply with the 72 GW of fossil fuel power scheduled to come online in the BRICS countries in 2024. By year's end, the BRICS nations will have approximately 2,289 GW of renewable energy capacity compared to 2,245 GW from fossil fuels. For comparison, the European Union reached this 50 per cent renewable energy share in the early 2010s, while the G7 achieved parity only last year.

The BRICS countries are also accelerating their renewable energy development. Wind and utility-scale solar projects under construction or in planning stages now total 1,550 GW — more than double the capacity of fossil fuel projects in the pipeline. When factoring in hydropower, the ratio of renewable projects to fossil fuel projects in development nears three to one.

This rapid development means BRICS nations are on track to nearly triple their renewable energy capacity by 2030, aligning with the global goal set at 28th Conference of Parties or COP28 to the United Nations Framework Convention on Climate Change to triple renewables and keep global warming within the 1.5 degrees Celsius limit. If the current growth in renewables continues, the BRICS bloc could see its total renewable energy capacity increase by more than 2.5 times by the decade's end.

Despite the progress, fossil fuels are not disappearing entirely from the BRICS energy mix. Every member nation, except Ethiopia, still has active coal, oil, or gas projects in development. If completed, these projects would expand coal capacity by 36 per cent and oil and gas capacity by 53 per cent. This ongoing investment in fossil fuels presents a challenge to the clean energy transition, as it risks undermining the substantial gains made in renewable energy development.

6. Indian Economy

India's economic growth

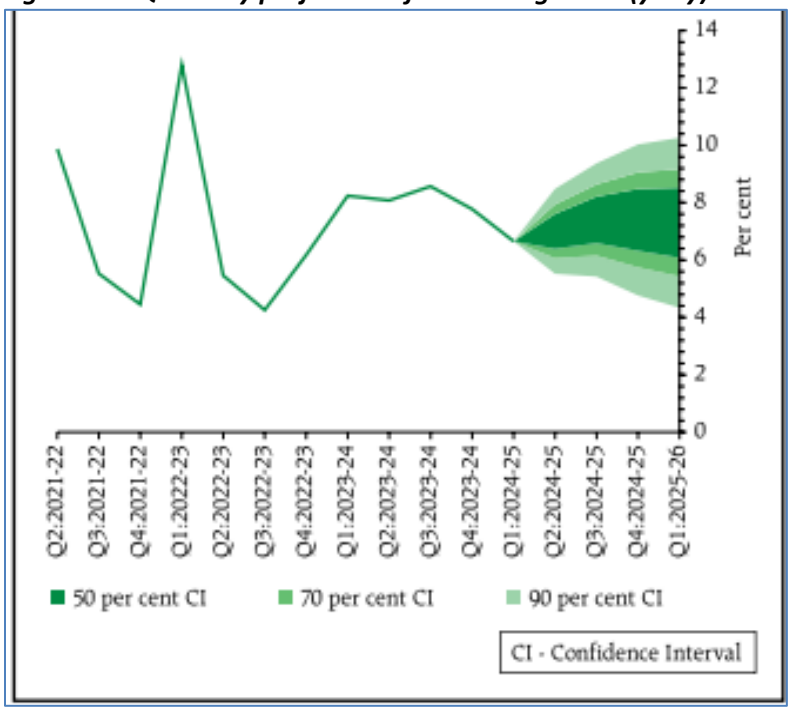
According to RBI, real GDP growth is expected at 7.2 per cent in 2024-25 with 7.0 per cent in Q2; 7.4 per cent both in Q3 and Q4.

For 2025-26, assuming a normal monsoon and no major exogenous or policy shocks, real GDP growth is estimated at 7.1 per cent, with Q1 at 7.3 per cent, Q2 at 7.2 per cent, Q3 and Q4 both at 7.0 per cent.

The growth is attributed to robust government capex and revival in private investment; improved prospects of agricultural sector due to favorable monsoon rainfall; strengthening manufacturing and services sector activity sustained by strong domestic demand; retreating global and domestic inflation.

However, despite the above growth momentum, challenges stand in terms of escalation in geopolitical tensions; volatility in international financial markets and geoeconomic fragmentation; deceleration in global demand; along with supply chain disruptions.

Figure 12: Quarterly projection of real GDP growth (y-o-y)



Source- NSO

Index of Industrial Production (IIP for month of August 2024)

The Quick Estimates of Index of Industrial Production (IIP) are released on 12th of every month with a six weeks lag. Key Highlights are as below: -

- The IIP growth rate for the month of August 2024 is (-)0.1 percent which was 4.7% in the month of July 2024.
- The growth rates of the three sectors, Mining, Manufacturing and Electricity for the month of August 2024 are (-)4.3 percent, 1.0 percent and (-)3.7 percent respectively. It is likely that the decline in the growth of Mining sector is due to heavy rainfall in the month of August 2024.
- The Quick Estimates of IIP stands at 145.6 in August 2024 against 145.8 in August 2023
- The Indices of Industrial Production for the Mining, Manufacturing and Electricity sectors for the month of August 2024 stand at 107.1, 145.9 and 212.3 respectively.
- Within the manufacturing sector, top three positive contributors for the month of August 2024 are – “Manufacture of basic metals” (3.0%), “Manufacture of electrical equipment” (17.7%), and “Manufacture of chemicals and chemical products” (2.7%).
- The corresponding growth rates of IIP as per Use-based classification in August 2024 over August 2023 are (-)2.6 percent in Primary goods, 0.7 percent in Capital goods, 3.0 percent in Intermediate goods, 1.9 percent in Infrastructure/ Construction Goods, 5.2 percent in Consumer durables

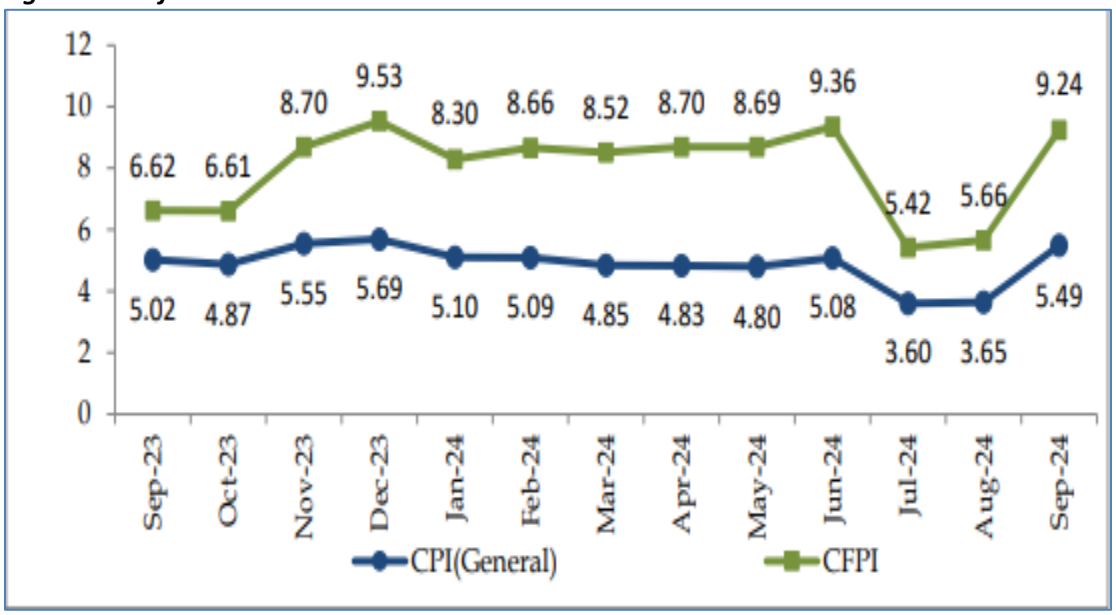
Figure 13: All India Index of Industrial Production

Source- Ministry of Statistics and Programme Implementation

Inflation in India

- Headline consumer price index (CPI) inflation moderated to 4.4 per cent in April-August 2024 from 5.2 per cent in H2:2023-24.
- Food price inflation, on the other hand, remained elevated, averaging 6.9 per cent over the last five months (April-August 2024) and contributing 72.5 per cent of headline inflation during the period.
- With domestic economic activity strengthening, and pick-up in southwest monsoon rainfall, the Monetary Policy Committee decided to keep the policy repo rate unchanged at 6.5 per cent while retaining the stance of withdrawal of accommodation.
- Further, year-on-year inflation rate based on All India Consumer Price Index (CPI) for the month of September, 2024 is 5.49%. Corresponding inflation rates for rural and urban are 5.87% and 5.05%, respectively.
- Year-on-year inflation rate based on All India Consumer Food Price Index (CFPI) number is 9.24% (Provisional) for the month of September, 2024. Corresponding inflation rate for rural and urban is 9.08% and 9.56%, respectively.

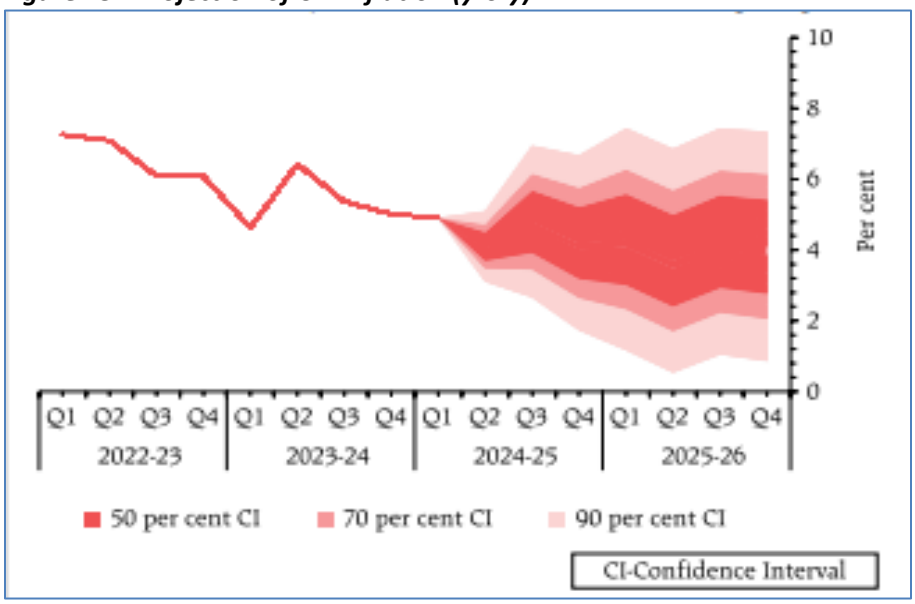
Figure 14: Inflation trends based on CPI and CFPI



Source- NSO

- According to RBI, CPI inflation for 2024-25 is projected at 4.5 per cent with Q2 at 4.1 per cent; Q3 at 4.8 per cent; and Q4 at 4.2 per cent. CPI inflation for Q1:2025-26 is projected at 4.3 per cent.

Figure 15: Projection of CPI inflation (y-o-y)



Source- NSO

Manufacturing PMI – India

- The headline HSBC Flash India Composite Output Index – a seasonally adjusted index that measures the month on-month change in the combined output of India's manufacturing and service sectors – rose to 58.6 this month from September's final reading of 58.3, which was a 10-month low.

- Growth in new orders and new export order led to this growth in October 2024, thereby improving business confidence.

- The HSBC Flash India Manufacturing PMI – a single-figure snapshot of factory business conditions calculated from measures of new orders, output, employment, supplier delivery times and stocks of purchases – posted 57.4 in October as against 56.7 in September. The reading signaled a further marked strengthening in business conditions for goods producers. The services industry reading rose slightly to 57.9 this month from 57.7 in September 2024.

India's external position

India's forex reserves

- India's forex reserves stand at $ 690 billion as of 11th October, 2024 according to RBI.

- According to the Weekly Statistical Supplement released by the RBI, foreign currency assets (FCAs) fell by $10.5 billion to $602 billion.

- Gold reserves decreased by $98 million, bringing the total down to $65.6 billion. The Special Drawing Rights (SDRs) dipped by $86 million, now totaling $18.3 billion, while the reserve position in the International Monetary Fund (IMF) contracted by $20 million, now standing at $4.3 billion.

India's foreign trade position

- India's total exports (Merchandise and Services combined) for September 2024 is estimated at USD 65.19 Billion, registering a growth of 3.76 percent vis-à-vis September 2023.

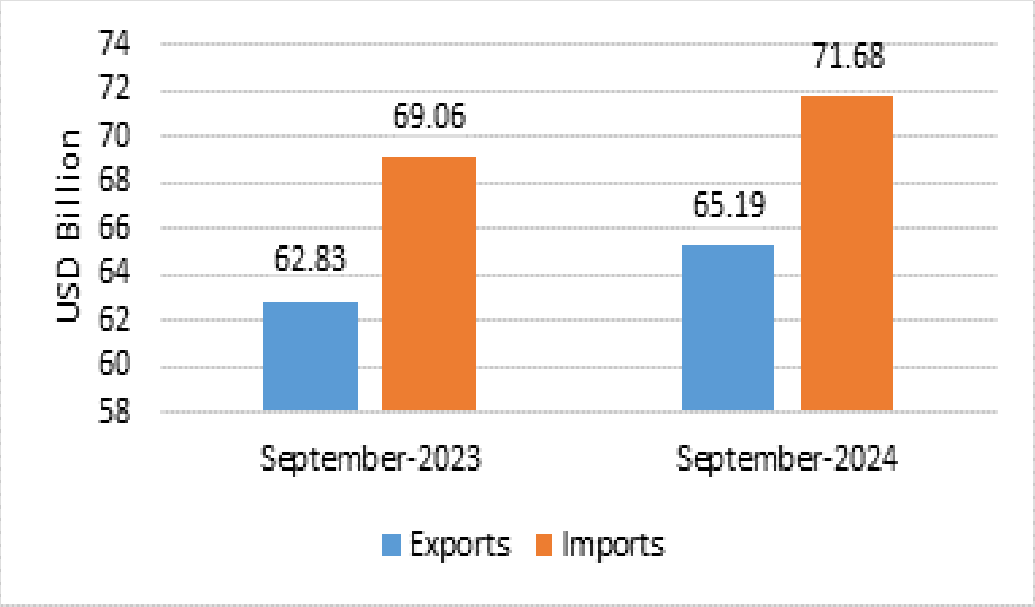
- Total imports (Merchandise and Services combined) for September 2024 is estimated at USD 71.68 Billion, registering a growth of 3.79 percent vis-à-vis September 2023.

Table 1: Trade during September 2024

		September 2024 (USD Billion)	September 2023 (USD Billion)
Merchandise	Exports	34.58	34.41
	Imports	55.36	54.49
Services	Exports	30.61	28.42
	Imports	16.32	14.58
Overall Trade (Merchandise + Services)	Exports	65.19	62.83
	Imports	71.68	69.06
	Trade Balance	**-6.49**	**-6.23**

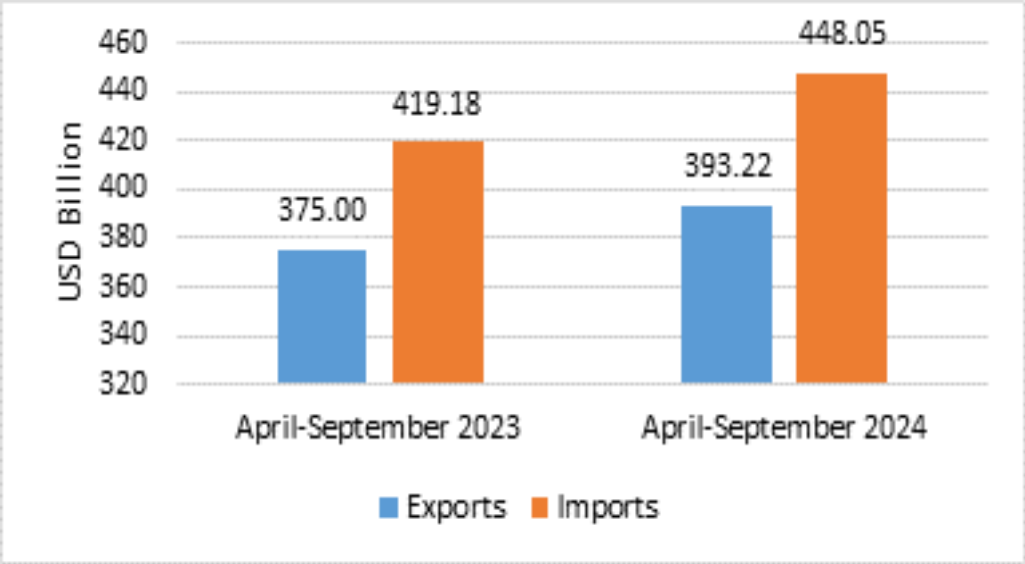
Source- Ministry of Commerce & Industry

Figure 16: Overall Trade during September 2024



Source- RBI

Figure 17: Total Trade during April- September 2024



Source- RBI

- India's total exports during April- September 2024 is estimated at USD 393.22 Billion registering a growth of 4.86 percent.
- Total imports during April- September 2024 is estimated at USD 448.05 Billion registering a growth of 6.89 percent.
- Exports of Coffee (74.75%), Tobacco (50.9%), Handicrafts Excl. Hand Made Carpet (48.09%), Plastic & Linoleum (28.32%), Spices (26.66%), Rice (24.93%), Rmg Of All Textiles (17.3%), Jute Mfg. Including Floor Covering (16.45%), Cereal Preparations & Miscellaneous Processed Items (15.25%), Carpet (14.93%), Oil Seeds (14.73%), Oil Meals (13%), Man-Made Yarn/Fabs./Made-Ups Etc. (11.41%), Organic & Inorganic Chemicals (11.21%), Engineering Goods (10.55%), Leather & Leather Products (8.86%), Fruits & Vegetables (8.38%), Electronic Goods (7.89%), Meat, Dairy & Poultry Products (7.85%), Drugs & Pharmaceuticals (7.22%), Tea (5.73%), Cotton Yarn/Fabs./Made-Ups, Handloom Products Etc. (3.48%) and Cashew (2.23%) record positive growth during September 2024 over the corresponding month of last year.
- Imports of Dyeing/Tanning/Colouring Mtrls. (-25.92%), Vegetable Oil (-23.24%), Pearls, Precious & Semi-Precious Stones (-21.62%), Leather & Leather Products (-16.62%), Newsprint (-13.62%), Petroleum, Crude & Products (-10.44%), Artificial Resins, Plastic Materials, Etc. (-8.76%), Coal, Coke & Briquettes, Etc. (-2.14%), Textile Yarn Fabric, Made-Up Articles (-1.8%) and Transport Equipment (-0.38%) record negative growth during September 2024 over the corresponding month of last year.
- Services exports is estimated to grow by 9.81 percent during April-September 2024 over April-September 2023.

- Top 5 export destinations, in terms of change in value, exhibiting growth in September 2024 vis a vis September 2023 are Netherland (38.6%), U Arab Emts (23.75%), U S A (4.98%), Brazil (41.98%) and Japan (36.35%).

- Top 5 export destinations, in terms of change in value, exhibiting growth in April-September 2024 vis a vis April-September 2023 are Netherland (36.73%), U S A (5.6%), U Arab Emts (11.45%), Malaysia (27.91%) and U K (12.4%).

7. India's GDP growth slowing from 7% in 2024 to 6.5% in 2025: IMF

- India's economy in terms of Gross Domestic Product (GDP) is expected to grow at a slower pace of 7 per cent in the current year, i.e. 2024 against the 8.2 per cent growth recorded in 2023. GDP growth will fall further to 6.5 per cent in 2025 as demand slows, according to the World Economic Outlook (WEO) published by the International Monetary Fund (IMF).

- The report raised the 2024 growth for the US economy to 2.8 per cent against the 2.6 per cent earlier forecast and to 2.2 per cent in 2025 against the July estimate of 1.9 per cent.

- Inflation in India has been projected to hover around 4.4 per cent this year and 4.1 per cent next year.

- The report says disinflation has been supported by the unwinding of the shocks, improvements in labor supply and immigration and monetary policy interventions.

8. Net FDI in India more than doubles in Apr-Aug 2024- RBI

- Net Foreign Direct Investment (FDI) in India i.e. inflows minus outflows—more than doubled in April–August this year to $6.62 billion from $3.26 billion in the same period last year.

- Gross inward FDI during April–August 2024 increased to $36.1 billion from $27.4 billion a year ago, according to the Reserve Bank of India's data.

- Repatriation/disinvestment by those who made direct investments in India rose to $20.76 billion in the five months of FY25, up from $18.88 billion in April–August 2023.

- Around two-thirds of the gross FDI inflows were directed towards manufacturing, financial services, communication services, and electricity and other energy sectors.

- About three-fourths of the flows were sourced from Singapore, Mauritius, the UAE, the Netherlands, and the US.

9. India Inc credit profiles benefit on high growth in H1

- High economic growth boosted India Inc's credit profile in the first half of FY25, and is set to improve further going ahead. Crisil Ratings, which rates nearly 7,000 companies, said the 'credit ratio' or the ratio of upgrades to downgrades in its portfolio, improved to 2.75 times in April-September as against 1.79 times in the preceding six months.

- The ratings of 506 companies were upgraded during the six months, while there were 184 downgrades. The agency has a positive credit outlook on India Inc, led largely by the government's infrastructure investment and private consumption, which is the driving force for the economic growth estimated at 6.8 per cent in FY25.

- Over 38 per cent of the rating upgrades were of infrastructure or related sectors in the April to September period (H1) of FY25, achieved on the back of strong sponsors and lower-than-expected debt.

- The agency said private sector capital expenditure is set to rise 10-12 per cent in FY25 over the Rs 4.3 lakh crore in FY24 on the back of the headroom that corporates have, mainly due to lean balance sheets, possibilities of interest rate cuts and rising capacity utilization.

- Over half of the capital expenditure comes from oil and gas refining/marketing, oil and gas exploration and production, primary steel, aluminum, cement sectors, while the infrastructure push from the government is expected to ensure that traditional industries such as cement, primary steel and aluminum continue investing in FY25 and FY26.

- On the credit quality outlook, it said the fast-moving consumer goods sector is showing positive movement given the expected increase in rural demand, while information technology, cement and fertilizers have moved downwards to 'favorable' from 'strong' bucket.

- It also said the borrowing costs have gone up 1.60 per cent since April 2022, yet corporate India has been able to maintain its profile on healthy growth in profits, well-behaved commodity prices and steady demand conditions.

10. India's renewable energy capacity hits 200 GW milestone

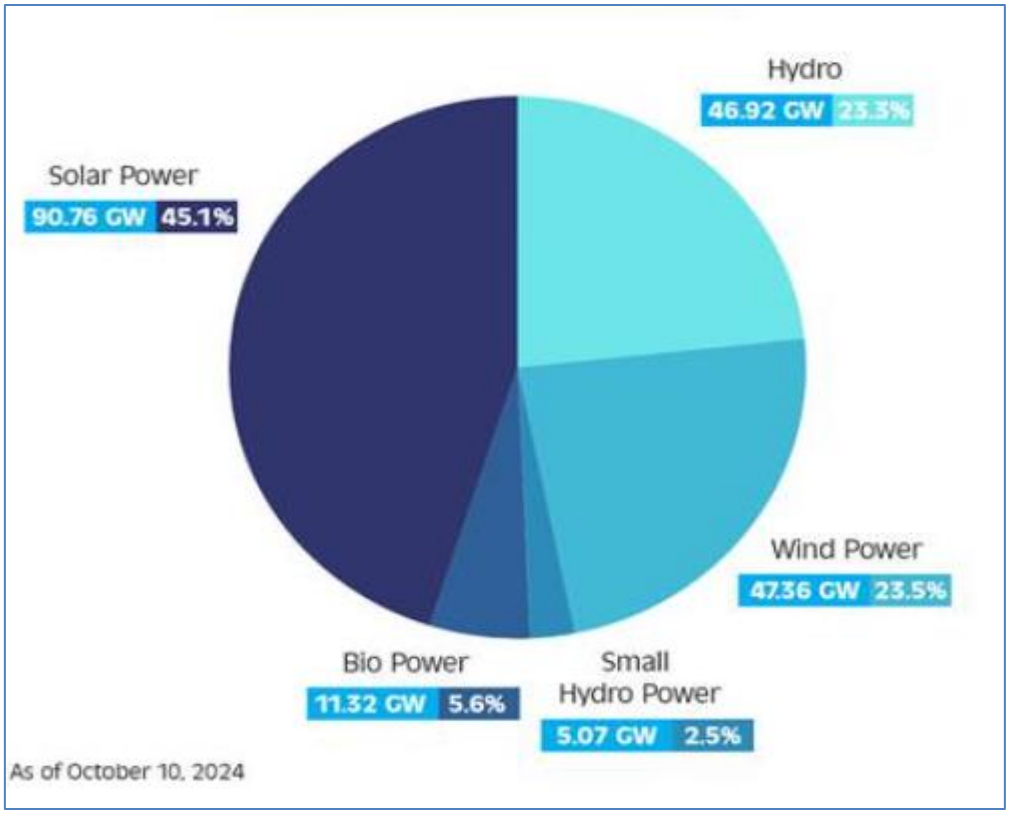
India's total electricity generation capacity has reached 452.69 GW, with renewable energy contributing a significant portion of the overall power mix. The country's total renewable energy capacity crossed the 200 GW (gigawatt) mark as of October 10, 2024. According to the Central Electricity Authority, the total renewable energy-based electricity generation capacity now stands at 201.45 GW, accounting for 46.3 percent of the country's total installed capacity. This achievement underscores India's growing commitment to clean energy and its progress in building a greener future.

When factoring in the 8,180 MW (megawatt) of nuclear capacity, the total non-fossil fuel-based power now accounts for almost half of the country's installed electricity generation capacity, signaling a strong move toward clean energy leadership on the global stage.

- Solar power leads the way with 90.76 GW, playing a crucial role in India’s efforts to harness its abundant sunlight.
- Wind power follows closely with 47.36 GW, driven by the vast potential of the coastal and inland wind corridors across the country.

- Hydroelectric power is another key contributor, with large hydro projects generating 46.92 GW and small hydro power adding 5.07 GW, offering a reliable and sustainable source of energy from India's rivers and water systems.
- Biopower, including biomass and biogas energy, adds another 11.32 GW to the renewable energy mix. These bioenergy projects are vital for utilizing agricultural waste and other organic materials to generate power, further diversifying India's clean energy sources.

Figure 18: Renewable energy capacity in India



Source- MNRE

Several states in India have emerged as leaders in renewable energy capacity, contributing significantly to the nation's progress.

- Rajasthan tops the list with an impressive 29.98 GW of installed renewable energy capacity, benefiting from its vast land and abundant sunlight.
- Following closely is Gujarat, which boasts a capacity of 29.52 GW, driven by its strong focus on solar and wind energy projects.
- Tamil Nadu ranks third with 23.70 GW, leveraging its favorable wind patterns to generate substantial energy.
- Karnataka rounds out the top four with a capacity of 22.37 GW, supported by a mix of solar and wind initiatives.

The Government of India has implemented a range of measures and initiatives aimed at promoting and accelerating renewable energy capacity across the nation, with an ambitious target of achieving 500 GW of installed electric capacity from non-fossil sources by 2030. Key programs include the National Green Hydrogen Mission, PM-KUSUM, PM Surya Ghar, and PLI schemes for solar PV modules.

11. India's GCC count rises to 1,700 in FY24, revenue up 40% at $64.6 billion: report

The number of global capability centres (GCCs) set up in India has increased to 1,700 in the fiscal year 2024 ending March, generating $64.6 billion in export revenue, and employing over 1.9 million people, as per the latest Nasscom-Zinnov India GCC landscape report.

The revenue is an increase of over 40% from $46 billion in the previous fiscal year ending March 2023. The total number of GCCs increased from around 1,580 employing around 1.66 million workforces.

India is the “GCC Capital of the World” (Global Capability Centers) with the largest base of 17% of global technology capability centers. By 2030, the GCC market in India is estimated to grow to $99-105 billion, with the number of GCCs reaching 2,100-2,200 and headcount rising to 2.5-2.8 million, the report highlighted. Although the Indian GCC landscape has become more diverse, the Americas continue their dominance with over 1000 GCC units.

Further, over 220 GCC units are housed in emerging locations (Tier-II and Tier-III cities) in the country with Ahmedabad, Kochi, Thiruvananthapuram, and Coimbatore building critical mass.

With a strong focus on innovation, these centres can unlock new growth by monetizing "India to India" services, leveraging local market insights, and expanding their domestic footprint. Over the past five years, global roles in India have also expanded significantly, with more than 6,500 such positions now established. Interestingly, this includes 1100+ women leaders holding Global Roles.

GCCs have rapidly evolved from being operational hubs to becoming true engines of innovation and strategic growth. Their maturity in digital capabilities, engineering excellence, and advanced technology solutions is truly remarkable. As they advance along the maturity curve, they are increasingly positioned to lead global agendas, secure critical managerial roles, and shape decision-making processes, setting the stage for India to become a global leader in digital transformation and sustainable business practices.

Further, given the exponential growth of AI and its potential to impact all products and services, GCCs in India are increasingly focused on building AI capabilities and driving the AI transformation for their internal enterprise. Capabilities include talent pool of over 120,000 AI professionals, with 30% of AI centres of excellence (COEs) housed in Software & Internet GCCs.

Lessons from Economics

Calculation of Gross Domestic Product (GDP)

GDP growth rate refers to the pace at which a country's Gross Domestic Product (GDP) expands or increases over a specific period, usually measured annually or quarterly. Gross Domestic Product (GDP) is the market worth of all final services and products produced within its boundaries over a certain period.

The GDP growth rate is calculated by comparing the GDP of one period with the GDP of a previous period. It is expressed as a percentage and provides a measure of the country's economic performance and overall economic health. If the GDP growth rate is positive, the economy is growing; if it is negative, it is contracting or in recession.

GDP is calculated using the following formula:

$$Y = C + I + G + (X - M)$$

- C represents consumption, which includes spending on services, non-durable goods, and durable goods.
- I denote investment, which consists of spending on housing and equipment.
- G represents government expenditure, which includes salaries of employees, construction of roads, railways, airports, schools, and military expenses.
- The difference between total exports and imports is referred to as net exports, denoted by (X-M).
- In this context, Y represents the Gross Domestic Product.

Higher GDP indicates increased economic output, which can lead to better job opportunities, higher incomes, and improved access to goods and services for the population.

The main sectors contributing to India's GDP are agriculture, industry, and services. Agriculture includes farming and related activities, industry includes manufacturing and construction, and services include sectors like finance, healthcare, education, and tourism.

Calculating GDP Based on Spending

One way of arriving at GDP is to count up all of the money spent by the different groups that participate in the economy. These include consumers, businesses, and the government. All pay for goods and services that contribute to the GDP total. Thus, a country's GDP is the total of consumer spending (C), business investment (I), government spending (G), and net exports, i.e. total exports minus total imports (X – M).

Calculating GDP Based on Income

This is an estimate of GDP that reflects the total amount of income paid to everyone in the country. This calculation includes all the factors of production that make up an economy. It includes the wages paid to labor, the rent earned by land, the return on capital in the form of interest, and the entrepreneur's profits. All of these make up the national income. In this income approach, the GDP of a country is calculated as its national income plus its indirect business taxes and depreciation, plus its net foreign factor income.

Types of GDP

Nominal GDP

Nominal GDP is an assessment of economic production in an economy that includes current prices in its calculation. All goods and services counted in nominal GDP are valued at the prices that those goods and services are sold for in that year. Nominal GDP is used when comparing different quarters of output within the same year. When comparing the GDP of two or more years, real GDP is used. This is because, in effect, the removal of the influence of inflation allows the comparison of the different years to focus solely on volume.

Real GDP

Real GDP is an inflation-adjusted measure that reflects the number of goods and services produced by an economy in a given year, with prices held constant from year to year to separate out the impact of inflation or deflation from the trend in output over time. Since GDP is based on the monetary value of goods and services, it is subject to inflation.

Rising prices tend to increase a country's GDP, but this does not necessarily reflect any change in the quantity or quality of goods and services produced. Thus, by looking just at an economy's nominal GDP, it can be difficult to tell whether the figure has risen because of a real expansion in production or simply because prices rose.

GDP per capita

GDP per capita is a way to achieve economic well-being that considers both the size of a country's economy and its population. The gross domestic product (GDP) divided by a country's population is a useful measure of the level of living and economic prosperity in that country. It indicates that the amount of output or income per person in an economy & can indicate average productivity or average living standards. GDP per capita can be stated in nominal, real (inflation-adjusted), or purchasing power parity (PPP) terms.

India's rank in GDP

Rank	Country	GDP (in U.S. dollars)	Annual Growth rate
1	United States of America	28.78 trillion	2.7%
2	China	18.53 trillion	4.6%
3	Germany	4.59 trillion	0.2%
4	Japan	4.11 trillion	0.9%
5	India	3.94 trillion	6.8%

Source- Data and rankings as per International Monetary Fund (IMF)

India is now the fifth-largest economy in the world GDP rankings list due to its strong economic foundations, thriving domestic demand, careful financial management, high saving rates and favorable demographic trends. The country's major economic contributors are traditional and modern agriculture, technology services, and business outsourcing.

Oil Market

Crude oil price – Monthly Review

Benchmark oil prices bounced sharply higher in early October, as potential oil supply risks once again took centre stage. Escalating tensions between Israel and Iran are fuelling fears of a broader Middle East conflict and disruptions to Iranian exports. However, a resolution to a political dispute in Libya, which temporarily halved its oil exports, along with relatively modest production losses from major hurricanes in the US Gulf Coast and weak end-user demand, have contributed to stabilizing markets.

Hedge funds and other money managers continued to be bearish on oil futures in September. This fuelled volatility and accelerated the decline in oil futures prices. Similarly in petroleum products, speculators turned net bearish on gasoil/diesel in both US and European markets. Between the weeks of 27 August and 10 September, speculators sold an equivalent of 174 mb of oil in ICE Brent and NYMEX WTI futures and options.

Oil futures prices declined for a second consecutive month in September, dropping approximately 8% m-o-m, amid heightened market volatility. This downturn was largely fuelled by significant selling pressure from hedge funds and other money managers. For the first time, the ICE Brent contract turned net bearish, signalling a further negative sentiment shift among non-commercial participants. Market sentiment played a key role in driving oil prices over the month.

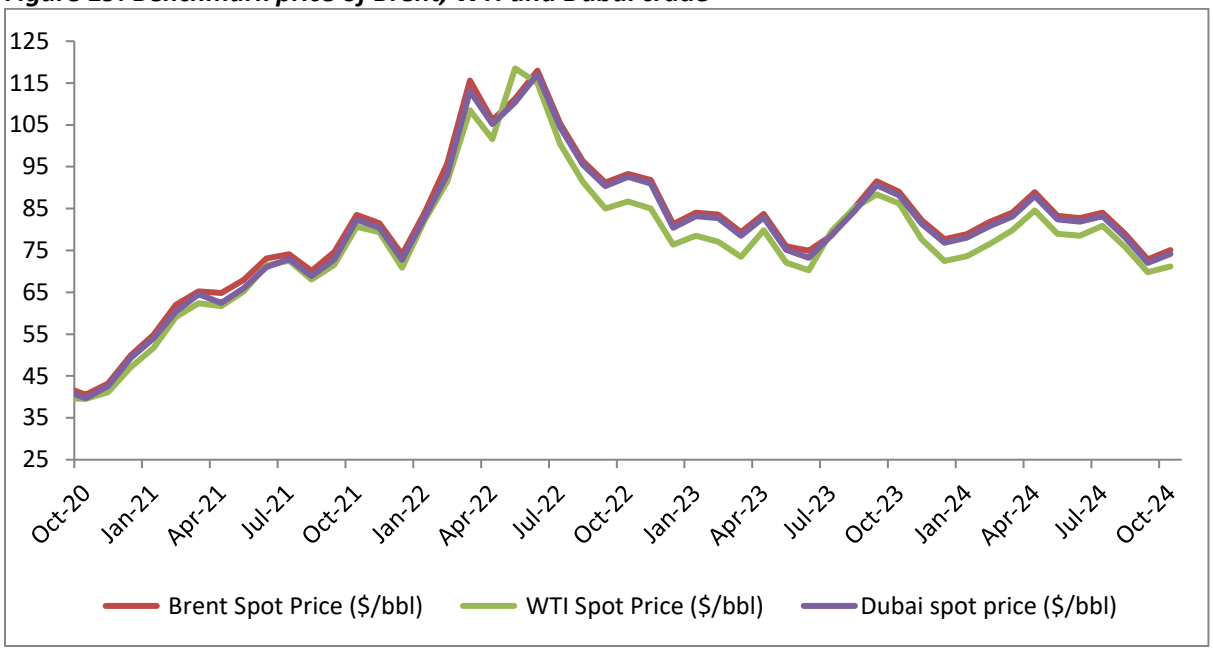
In September, crude oil spot prices continued their downward trend, extending losses from the previous month, as selling pressure from non-commercial participants in the oil futures market accelerated. Spot prices also came under pressure from lower refining margins in all markets, as well as the refinery maintenance season.

The sweet-sour crude differentials showed mixed movement among regions. In Europe and Asia, the spread contracted due to a softening of market fundamentals for light sweet crude, primarily driven by slowing demand during the maintenance season and the high availability of light sweet crude in the Atlantic Basin, including increased US crude exports. A decline in gasoline crack spreads in all refining hubs also weighed on the value of light sweet crude. However, the value of medium sour crudes experienced a smaller decline compared to light sweet crudes. In the US Gulf Coast (USGC), the sweet-sour crude spread widened slightly.

The OPEC Reference Basket (ORB) value fell in September by $4.82/b, or 6.1%, to stand at $73.59/b. The ICE Brent front-month contract dropped by $6.01, or 7.6%, m-o-m, to average $72.87/b in September, while NYMEX WTI dropped by $6.06, or 8.0%, m-o-m, to average $69.37/b. The GME Oman front-month contract dropped by $4.63, or 6.0%, m-o-m, to average $72.91/b. The ICE Brent-NYMEX WTI first month spread rose by 5¢ in September, compared to the August average, to average $3.50/b.

Brent crude ranged an average to $75.05 a barrel and WTI ranged to $71.18 per barrel in the month of October 2024.

Figure 19: Benchmark price of Brent, WTI and Dubai crude



Source- World Bank

- Brent crude price averaged $75.05 per bbl in October 2024, up by 2.9% on a month on month (MoM) and down by 15.7% on year on year (YoY) basis, respectively.

- WTI crude price averaged $71.18 per bbl in October 2024, up by 1.9% on a month on month (MoM) and down by 17.5% on year on year (YoY) basis, respectively.

- Dubai crude price averaged $74.20 per bbl in October 2024, up by 3.0% on a month on month (MoM) and down by 15.8% on year on year (YoY) basis, respectively.

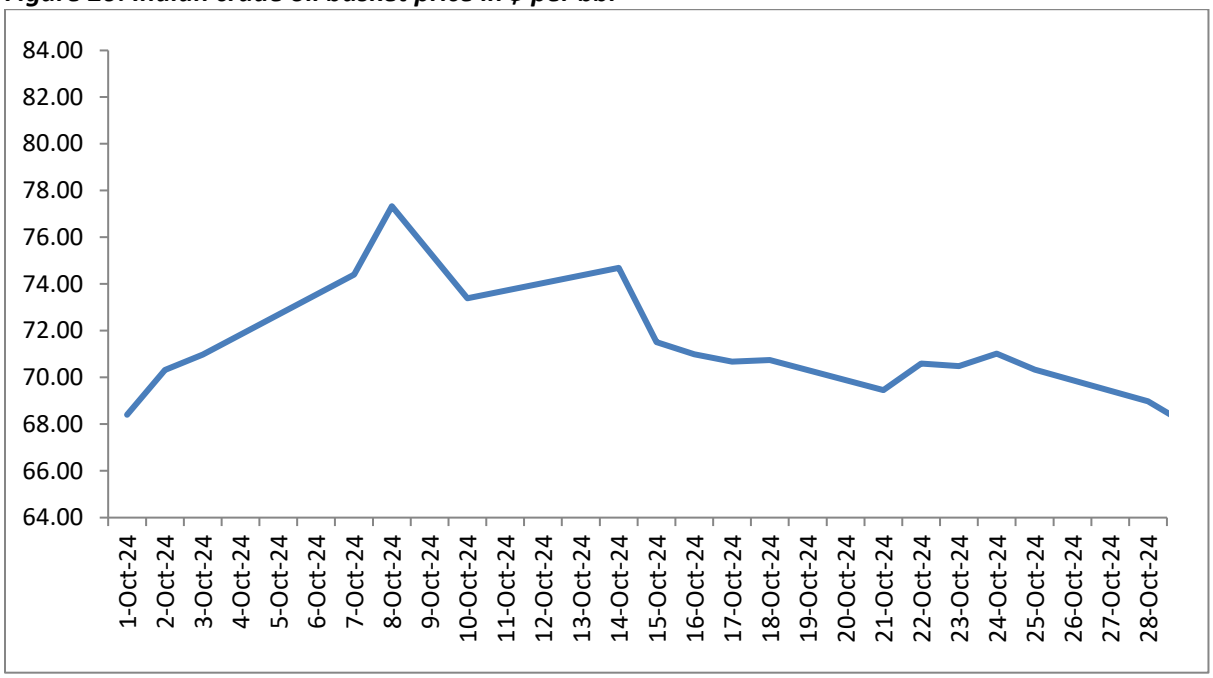
Table 2: Crude oil price in October, 2024

Crude oil	Price ($/bbl)	MoM (%) change	YoY (%) change
Brent	75.05	2.9%	-15.7%
WTI	71.18	1.9%	-17.5%
Dubai	74.20	3.0%	-15.8%

Source- World Bank

Indian Basket Crude oil price

Figure 20: Indian crude oil basket price in $ per bbl



Source- PPAC

- Indian crude basket price averaged $75.48 per barrel in October 2024, up by 2.4% on Month on Month (M-o-M) and down by 16.3% on a year on year (Y-o-Y) basis, respectively.

Oil production situation

- Non-DoC liquids supply (i.e. liquids supply from countries not participating in the DoC) is expected to grow by 1.2 mb/d, y-o-y, in 2024, unchanged from last month's assessment. The main growth drivers are expected to be the US, Canada, Brazil and China. The non-DoC liquids supply growth forecast for 2025 is also unchanged at 1.1 mb/d, y-o-y. Growth is anticipated to be mainly driven by the US, Brazil, Canada, and Norway.
- Natural gas liquids (NGLs) and non-conventional liquids from countries participating in the DoC is forecast to grow by about 0.1 mb/d, y-o-y, to average 8.3 mb/d in 2024, followed by an increase of about 70 tb/d, y-o-y, to reach 8.4 mb/d in 2025. Crude oil production by the countries participating in the DoC decreased by 0.56 mb/d in September compared with the previous month, averaging about 40.10 mb/d, as reported by available secondary sources.

Table 3: Non-DoC liquids production in 2024, mb/d

Non-OPEC liquids production	2023	1Q24	2Q24	3Q24	4Q24	2024
Americas	26.67	26.91	27.58	27.57	27.70	27.44
of which US	*20.97*	*21.02*	*21.81*	*21.64*	*21.62*	*21.52*
Europe	3.65	3.66	3.59	3.58	3.73	3.64
Asia Pacific	0.45	0.46	0.43	0.47	0.45	0.45
Total OECD	**30.77**	**31.03**	**31.59**	**31.62**	**31.89**	**31.54**
China	4.52	4.62	4.63	4.53	4.50	4.57
India	0.79	0.80	0.79	0.79	0.79	0.79
Other Asia	1.61	1.62	1.62	1.60	1.59	1.61
Latin America	6.96	7.28	7.19	7.18	7.46	7.28
Middle East	2.02	2.00	2.00	2.01	2.02	2.01
Africa	2.22	2.24	2.26	2.34	2.29	2.28
Other Eurasia	0.37	0.37	0.37	0.37	0.37	0.37
Other Europe	0.10	0.10	0.10	0.10	0.10	0.10
Total Non-OECD	**18.60**	**19.03**	**18.96**	**18.91**	**19.13**	**19.01**
Total Non-DoC production	49.37	50.06	50.56	50.53	51.02	50.55
Processing gains	2.47	2.52	2.52	2.52	2.52	2.52
Total Non-DoC liquids production	**51.84**	**52.58**	**53.08**	**53.05**	**53.54**	**53.07**

*Note. *2024 = Forecast. Totals may not add up due to independent rounding*
Source- OPEC monthly report, September 2024

- From the above table, it can be inferred, that the total non-DoC liquids production is expected to reach 53.07 mb/d by 2024.
- The non-DoC liquids supply (i.e. liquids supply from countries not participating in the Declaration of Cooperation) is expected to grow by 1.2 mb/d in 2024.

Oil demand situation

- The global oil demand growth forecast for 2024 is revised down by 106 tb/d to 1.9 mb/d, y-o-y, still well above the historical average of 1.4 mb/d seen before the COVID-19 pandemic. The adjustment reflects actual data received, combined with slightly lower expectations for some regions. OECD oil demand is expected to grow by more than 0.1 mb/d, y-o-y, in 2024, with the OECD Americas driving growth. Non-OECD oil demand is forecast to grow by 1.8 mb/d, y-o-y, this year.
- The forecast for world oil demand growth in 2025 is also revised down by 102 tb/d to 1.6 mb/d, y-o-y. Non-OECD oil demand is set to drive next year's growth, increasing by about 1.5 mb/d, y-o-y, led by contributions from China, Other Asia, the Middle East, and India. The OECD demand is forecast to expand by about 0.1 mb/d, y-o-y, with OECD Americas providing most of the contribution.

Table 4: World Oil demand, mb/d

	2023	1Q24	2Q24	3Q24	4Q24	2024	Growth	%
Total OECD	**45.65**	**44.80**	**45.74**	**46.34**	**46.21**	**45.78**	**0.13**	**0.28**
~ of which US	*20.36*	*19.92*	*20.47*	*20.71*	*20.85*	*20.49*	*0.13*	*0.62*
Total Non-OECD	**56.56**	**58.02**	**57.62**	**58.38**	**59.40**	**58.36**	**1.80**	**3.18**
~ of which India#	*5.34*	*5.66*	*5.66*	*5.48*	*5.65*	*5.61*	*0.27*	*5.02*
~ of which China	16.36	16.66	16.75	17.09	17.25	16.94	0.58	3.56
Total world	**102.21**	**102.81**	**103.36**	**104.73**	**105.61**	**104.14**	**1.93**	**1.89**

Source- OPEC monthly report, September 2024

Note: 2024 = Forecast. Totals may not add up due to independent rounding*

Global petroleum product prices

USGC refining margins continued to retract against WTI for the second consecutive month, with supply side pressure leading to losses across the barrel. The impact of strong refinery runs seen in August, along with a seasonal decline in road transportation fuels amid the end of the driving season, kept product markets well supplied despite a monthly decline in total US product inventories. These combined supply side and seasonality-related pressures offset solid demand support linked with robust diesel exports to Europe and Brazil.

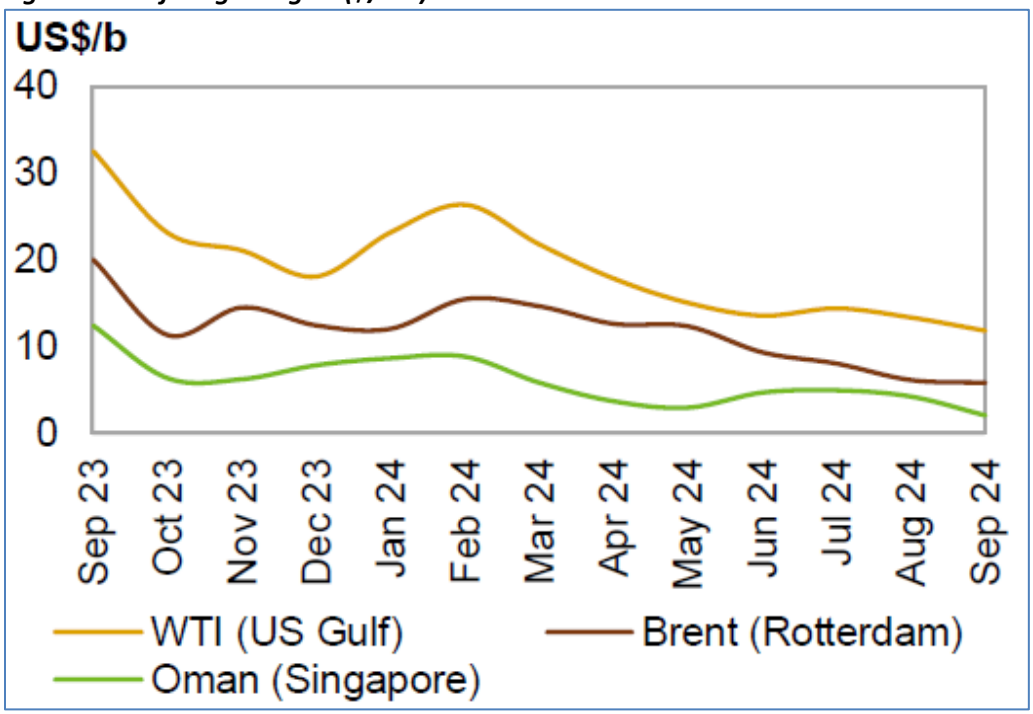
The landfall of hurricanes Francine and Helene in September resulted in power outages, floods, and damage across several states. There is the possibility of temporary and indirect logistical, infrastructure and fuel distribution constraints, though the direct impact on refining activities, plants and refinery intake was deemed limited.

Less optimistic market sentiment at the end of the summer season led to a stronger wholesale product price decline across the barrel, m-o-m. The average USGC product price drop across the barrel was $8.71/b in September at the refinery gate. This was most pronounced for gasoline, which was $14.54/b, m-o-m, lower. Although diesel exports to Europe were robust throughout the month, slower overall product demand led to inventory builds.

Refinery intake in the USGC was 920 tb/d, m-o-m, lower, averaging 16.03 mb/d in September. USGC margins against WTI averaged $11.74/b in September, down by $1.54, m-o-m, and $20.83, y-o-y.

Refinery margins in Rotterdam against Brent declined for the seventh consecutive month but showed the smallest decline over this time in September, compared with registered margins in the USGC against WTI and Singapore against Oman.

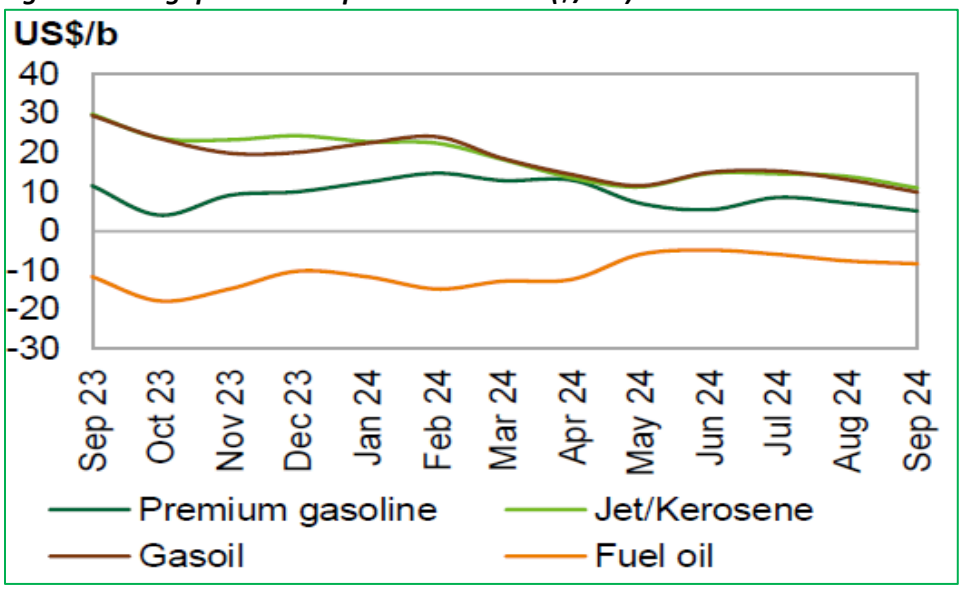
Figure 21: Refining Margins ($/bbl)



Source- Argus and OPEC

The Southeast Asia gasoline 92 crack spread against Dubai extended its downward trend due to a lengthening balance. This was a result of challenging export opportunities, as Western markets were generally well-supplied and had softer regional requirements. The East of Suez gasoline market is expected to tighten further going forward, with the recent release of the new product export quotas available to refiners in China. This upside is expected particularly around October, amid the onset of the heavy maintenance season in the Atlantic Basin. The product's margin averaged $4.98/b in September, down $2.07, m-o-m, and $6.56, y-o-y.

Figure 22: Singapore crack Spreads vs. Dubai ($/bbl)



Source- Argus and OPEC

The Singapore gasoil crack spread trended downwards as weak gasoil demand continued to pose a challenge and contributed to an oversupply even beyond the region. In China, a crisis in property markets amid lower growth in the manufacturing sector weighed on gasoil consumption levels. Consequently, some Chinese refiners have opted to reduce gasoil output due to low margins. Sinopec's Shanghai Petrochemical, generally representative of China's integrated state-owned refineries, was reported to have reduced its gasoil production by 24.9%, y-o-y, to 1.39 million metric tons in the first six months of the year, as domestic demand for the fuel declined, while it raised jet fuel production by 51% to 1.23 mt during the same period (Platts). The Singapore gasoil crack spread against Dubai averaged $9.90/b, down $3.13, m-o-m, and $19.61, y-o-y.

Table 5: Singapore FOB, refined product prices ($/bbl) in September 2024

Singapore product prices	Price ($/b)	MoM (%) change	YoY (%) change
Naphtha	70.29	-3.4%	-5.9%
Premium gasoline (unleaded 95)	82.87	-6.8%	-24.6%
Regular gasoline (unleaded 92)	78.37	-7.4%	-25.0%
Jet/Kerosene	84.43	-7.8%	-31.2%
Gasoil/Diesel (50 ppm)	84.14	-8.6%	-32.6%
Fuel oil (180 cst 2.0% S)	83.06	-8.0%	-31.6%
Fuel oil (380 cst 3.5% S)	64.94	-6.2%	-20.0%

Source- OPEC

Petroleum products consumption in India

Monthly Review:

- Overall consumption of all petroleum products in September 2024 with a volume of 17.92 MMT registered de-growth of 1.90% on volume of 18.27 MMT in September 2023.
- MS (Petrol) consumption during the month of September 2024 with a volume of 3.15 MMT recorded a growth of 2.95% on volume of 3.06 MMT in September 2023.
- HSD (Diesel) consumption during the month of September 2024 with a volume of 6.37 MMT recorded de-growth of 1.85% on volume of 6.49 MMT in the month of September 2023.
- LPG consumption during the month of September 2024 with a volume of 2.59 MMT registered growth of 1.56% over the volume of 2.55 MMT in the month of September 2023.
- ATF consumption during September 2024 with a volume of 0.726 MMT registered a growth of 10.46% over the volume of 0.657 MMT in September 2023.
- Bitumen consumption during September 2024 with a volume of 0.501 MMT registered de-growth of 8.42% over volume of 0.547 MMT in the month of September 2023.
- Kerosene consumption registered growth of 14.47% during the month of September 2024 as compared to September 2023.

Table 6: Petroleum products consumption in India, September 2024 and Year till Date (YTD) 2024

	Monthly			Year till Date	
Consumption of Petroleum Products (P)	**Consumption in '000 MT**	**MoM (%) change**	**YoY (%) change**	**Consumption in '000 MT**	**YoY (%) change**
LPG	2,591	-2.3%	1.6%	14,981	5.99%
Naphtha	1,033	-11.8%	3.5%	6,750	5.37%
MS	3,149	-6.3%	3.0%	19,850	7.23%
ATF	726	-0.8%	10.5%	4,377	10.38%
SKO	36	5.1%	14.5%	205	-21.64%
HSD	6,373	-2.0%	-1.8%	44,388	0.87%
LDO	71	-11.0%	13.3%	390	-1.23%
Lubricants & Greases	364	2.7%	12.4%	2,324	25.85%
FO & LSHS	571	9.0%	6.7%	3,318	0.28%
Bitumen	501	22.8%	-8.4%	3,836	-1.09%
Petroleum coke	1,612	-4.0%	6.2%	10,720	17.73%
Others	887	-2.6%	-40.3%	6,589	-7.07%
TOTAL	**17,916**	**-2.7%**	**-1.9%**	**1,17,728**	**4.27%**

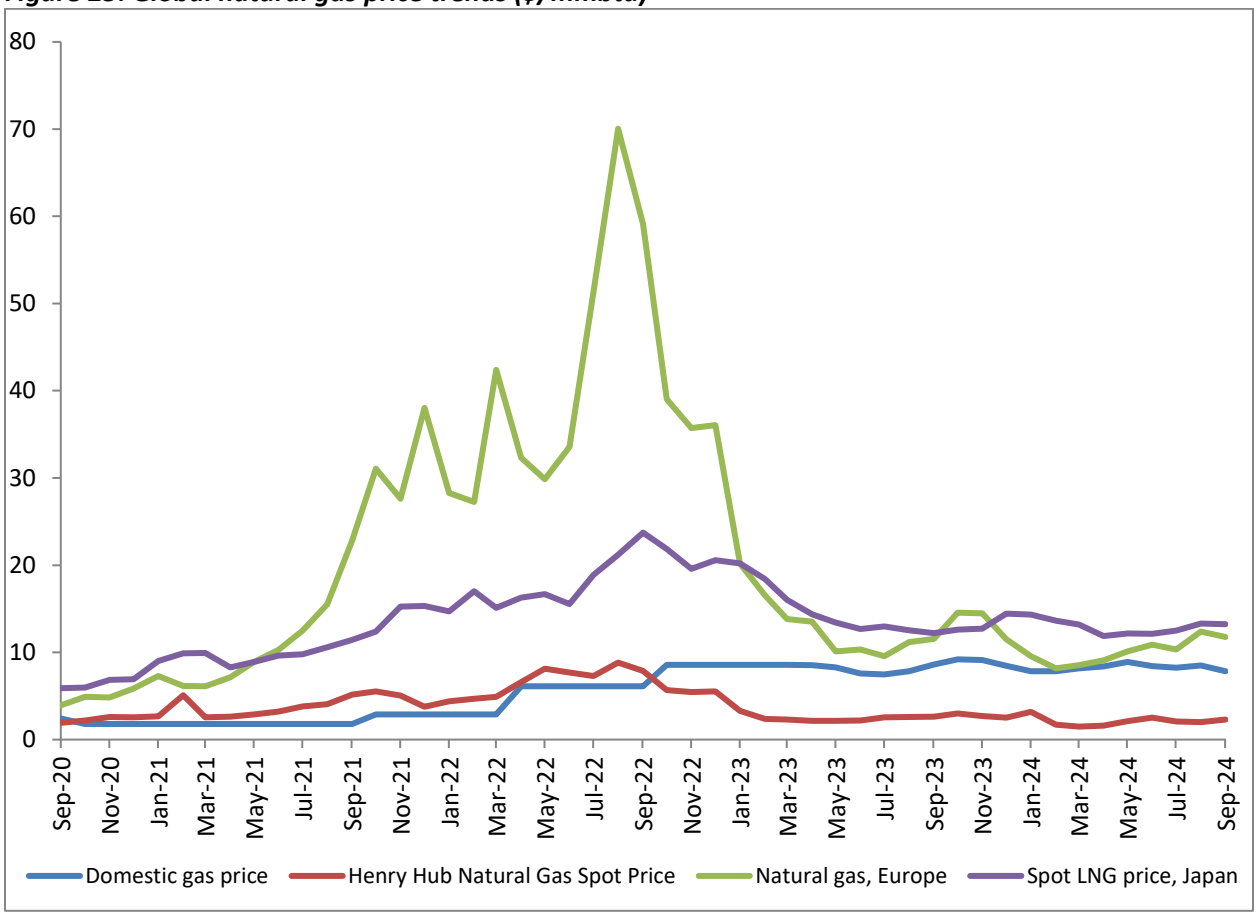
Source- PPAC
Fiscal Year: 1st April 2024 – 31st March 2025

Natural Gas Market

Natural Gas Price – Monthly Review

- Natural gas spot prices at the US Henry Hub benchmark averaged $2.28 per million British thermal units (MMBtu) in September 2024. Henry Hub's natural gas prices rebounded in September after two consecutive months of decreases, up by 13.1%, m-o-m. Prices rallied on the back of supply disruptions in the Gulf of Mexico amid the hurricane season. They were further supported by higher US LNG exports to Asia ahead of the winter demand season. Higher price differentials in Asia compared with Europe's prices supported more US LNG volumes heading to Asia. Prices were down by ~14%, y-o-y.
- The natural gas spot price at the Title Transfer Facility (TTF) in the Netherlands in Europe traded at an average of $11.78 per MMBtu. The average Title Transfer Facility (TTF) price went from $12.37/mmbtu in August to $11.78/mmbtu in September, representing a 4.8%, m-o-m, decline. Prices experienced some volatility earlier in the month amid geopolitical developments and concerns over supply disruption from the US amid the hurricane season. However, reports of ample supplies – with EU storage levels remaining above 90% of capacity as of 30 September, according to data from Gas Infrastructure Europe – and softer demand exerted downward pressure on prices, helping to ease volatility, hence, prices were up by 2.0%, y-o-y only.
- Japan Liquefied Natural Gas Import Price averaged at $13.24 per MMBtu for September 2024. There is a change of -0.6% from last month and 8.4% from one year ago.
- The Union Cabinet has approved a new formula for pricing of natural gas and imposed cap or ceiling price on the same. Natural gas produced from legacy or old fields, known as APM gas, will now be indexed to crude oil prices. From April 1 2023, APM gas will be priced at 10% of the price of basket of crude oil that India imports. The rate such arrived at however will be capped at US$ 6.5 per MMBTU. The price such arrived at will also have a floor of US$4 per MMBTU.
- Further, in accordance with MoP&NG, Govt. of India, pricing freedom for gas being produced from discoveries in Deepwater, Ultra Deepwater and High Pressure-High Temperature areas, the gas price ceiling for the period 1st April, 2023 - 30th September, 2023 was notified as US$ 12.12/MMBTU on Gross Calorific Value (GCV) basis as per notification dated 31st March, 2023. Gas price ceiling was further revised for the period 1st October, 2023 – 31st March, 2024 was notified as US$9.96/MMBTU on Gross Calorific Value (GCV) basis as per notification dated 30th September 2023. Gas price ceiling was further revised for the period 1st April, 2024 – 30th September, 2024 was notified as US$9.87/MMBTU on Gross Calorific Value (GCV) basis as per notification dated 31st March 2024. As per notification dated 30th September 2024, Gas price ceiling was further revised for the period 1st October, 2024 – 31st March, 2025 as US$10.16/MMBTU on Gross Calorific Value (GCV) basis.

Figure 23: Global natural gas price trends ($/mmbtu)



Source- EIA, World Bank

Table 7: Gas price, September 2024

Natural Gas	Price ($/MMBTU)	MoM (%) change	YoY (%) change
India, Domestic gas price (Oct'24)	7.48	-4.71	-18.70
India, Gas price ceiling – difficult areas (Oct'24-Mar'25)	10.16	2.94%	2.01%
GIXI (Gas index of India) price*	13.7	8%	22%
Henry Hub	2.28	14.6%	-13.6%
Natural Gas, Europe	11.78	-4.8%	2.0%
Liquefied Natural Gas, Japan	13.24	-0.6%	8.4%

Source- EIA, PPAC, World Bank, IGX

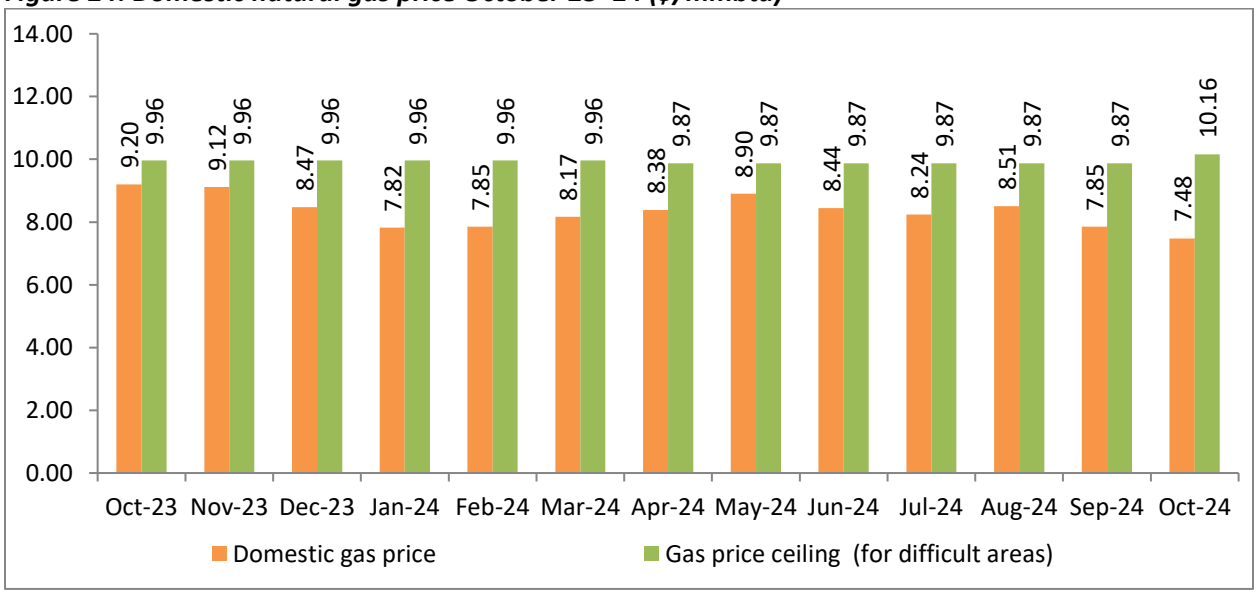
**Prices are weighted average prices (excluding ceiling price gas)*

Table 8: Gas price, GCV Basis

Period	Domestic Gas calculated price in US$/MMBTU	Gas price ceiling – difficult areas price in US$/MMBTU
1-31 May 2023	8.27	12.12
1-30 June 2023	7.58	12.12
1-31 July 2023	7.48	12.12
1-31 August 2023	7.85	12.12
1-30 September 2023	8.60	12.12
1-31 October 2023	9.20	9.96
1-30 November 2023	9.12	9.96
1-31 December 2023	8.47	9.96
1-31 January 2024	7.82	9.96
1-29 February 2024	7.85	9.96
1-31 March 2024	8.17	9.96
1-30 April 2024	8.38	9.87
1-31 May 2024	8.90	9.87
1-30 June 2024	8.44	9.87
1-31 July 2024	8.24	9.87
1-31 August 2024	8.51	9.87
1-30 September 2024	7.85	9.87
1-31 October 2024	7.48	10.16

Source- PPAC

Figure 24: Domestic natural gas price October'23–24 ($/mmbtu)



Source- PPAC

Indian Gas Market

- Gross production of natural gas for the month of September 2024 (P) was 2977 MMSCM which was lower by 1.6% compared with the corresponding month of the previous year.

- Total import of LNG (provisional) during the month of September 2024 was 2932 MMSCM (P) (increase of 13.5 % over the corresponding month of the previous year).

- Natural gas available for sale during September 2024 was 5411 MMSCM (increase of 5.8% over the corresponding month of the previous year).

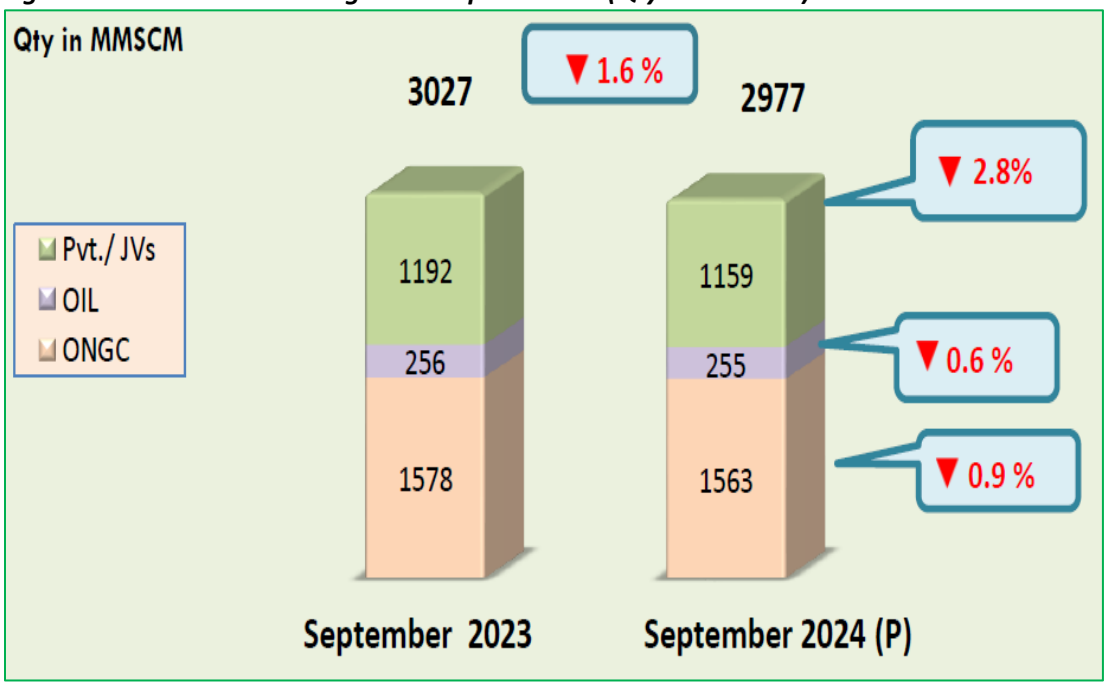
- Total consumption during September 2024 was 5752 MMSCM (provisional). Major consumers were fertilizer (29%), City Gas Distribution (CGD) (20%), Power (12%), Refinery (8%) and Petrochemicals (4%).

Monthly Report on Natural gas production, imports, and consumption – September 2024

1. Domestic Natural Gas Gross Production:

Domestic natural gas gross production for the month of September 2024 was 2977 MMSCM (decrease of 1.6% over the corresponding month of the previous year).

Figure 25: Domestic natural gas Gross production (Qty in MMSCM)

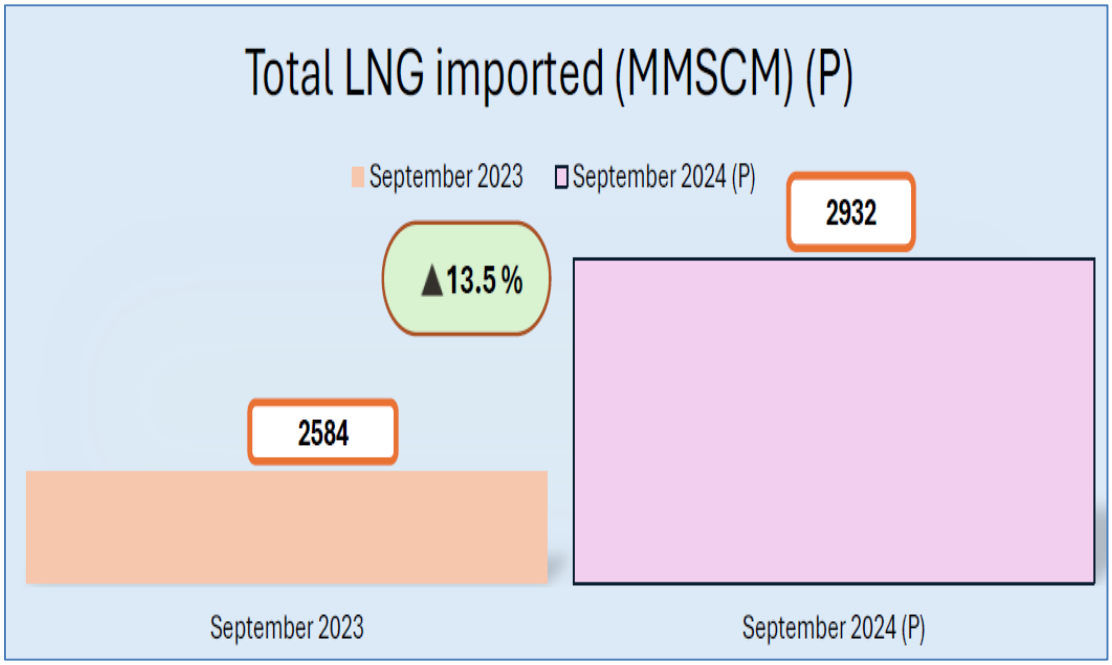


Source- PPAC

2. LNG imports:

Total import of LNG (provisional) during the month of September 2024 was 2932 MMSCM (P) (increase of 13.5 % over the corresponding month of the previous year).

Figure 26: LNG imports (Qty in MMSCM)

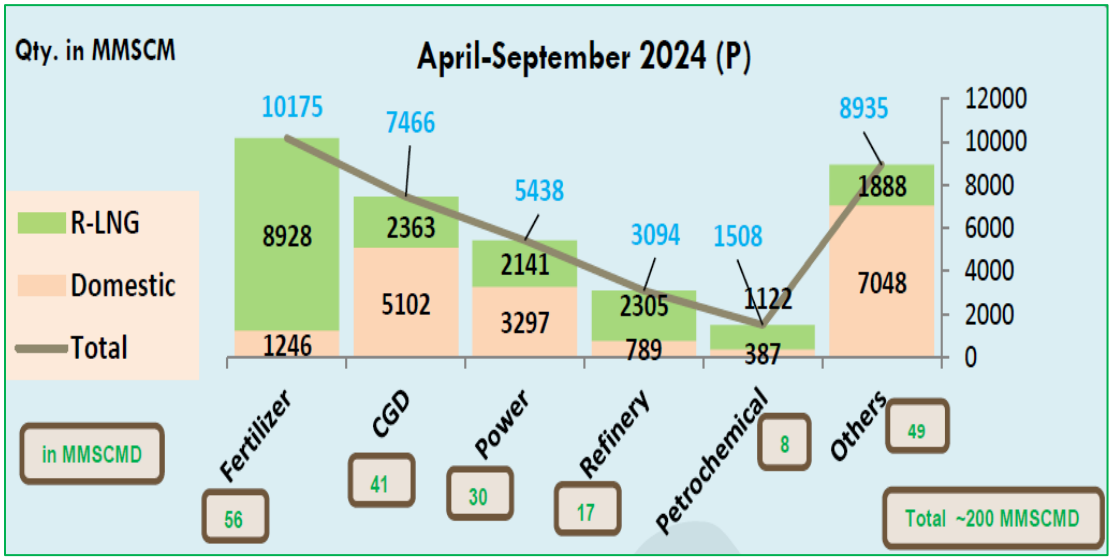


Source- PPAC

3. Sectoral Consumption of Natural Gas:

Major consumers were fertilizer, CGD, power, refinery, petrochemicals among others.

Figure 27: Sectoral Consumption of Natural Gas (Qty in MMSCM) in April-September 2024



Source- PPAC

Key developments in Oil & Gas sector

- **Monthly Production Report for September, 2024**

1. Production of Crude Oil

Indigenous crude oil and condensate production during September 2024 was 2.1 MMT. OIL registered a production of 0.3 MMT, ONGC registered a production of 1.4 MMT whereas PSC/RSC registered production of 0.4 MMT during September 2024. There is a de-growth of 3.9 % in crude oil and condensate production during September 2024 as compared with the corresponding period of the previous year.

2. Production of Natural Gas

Gross production of natural gas for the month of September 2024 (P) was 2977 MMSCM which was lower by 1.6% compared with the corresponding month of the previous year. The cumulative gross production of natural gas of 18160 MMSCM for the current financial year till September 2024 was higher by 1.6% compared with the corresponding period of the previous year.

3. Crude Oil Processed (Crude Throughput)

Total Crude oil processed during September 2024 was 21.2 MMT which is 4.4 % higher than September 2023, where PSU/JV refiners processed 13.9 MMT and private refiners processed 7.3 MMT of crude oil. Total indigenous crude oil processed was 1.8 MMT and total Imported crude oil processed was 19.4 by all Indian refineries (PSU+JV+PVT). There was a growth of 1.8 % in total crude oil processed in April-September FY 2024-25 as compared to same period of previous year.

4. Production of Petroleum Products

Production of petroleum products was 22.7 MMT during September 2024 which is 5.8% higher than September 2023. Out of 22.7 MMT, 22.4 MMT was from refinery production & 0.3 MMT was from fractionator. There was a growth of 2.4 % in production of petroleum products in April-September FY 2024 – 25 as compared to same period of FY 2023 – 24. Out of total POL production, in September 2024, share of major products including HSD is 39.4 %, MS 17 %, Naphtha 6.4 %, ATF 6.7 %, Pet Coke 5 %, LPG 4.4 %, and rest is shared by Bitumen, FO/LSHS, LDO, Lubes & others.

Key Policy developments/Significant news in Energy sector

Government's Support Fuels Transformation of Bioenergy Ecosystem in India: Petroleum Minister Hardeep Singh Puri

At the 12th Edition of the CII Bioenergy Summit, Shri Hardeep Singh Puri, Minister of Petroleum and Natural Gas, underscored India's remarkable progress in bioenergy, aligning with the summit's theme, "Fuelling the Future - Securing India's Green Growth Goals." Shri Puri highlighted the success of India's ethanol blending initiative, which has seen the blending percentage rise from 1.53% in 2014 to a projected 15% by 2024. Encouraged by these results, the government has advanced its target for 20% blending to 2025, reinforcing its commitment to sustainable energy. He further revealed that discussions have already started to develop a roadmap for the future, post the attainment of the 20% blending target. This roadmap will guide the country's next steps in its pursuit of energy sustainability and self-reliance.

Shri Hardeep Singh Puri commended Prime Minister Shri Narendra Modi's leadership in transforming India's bioenergy ecosystem since 2014. He emphasized the crucial role of market dynamics, technology advancements, and supportive government policies in driving this transformation and enhancing sustainability in the energy sector.

The Minister shared impressive outcomes of the ethanol program, revealing that from 2014 to August 2024, it has generated foreign exchange savings of ₹1,06,072 crore, reduced CO2 emissions by 544 lakh metric tons, and achieved crude oil substitution of 181 lakh metric tons. Payments to distillers by OMCs have reached ₹1,50,097 crore. Furthermore, he said, farmers have been paid ₹90,059 crore, empowering them from being *Annadata* to being *Urjadata*. Additionally, he mentioned about the government's ambitious targets for Sustainable Aviation Fuel (SAF), aiming for 1% blending in 2027 and 2% in 2028, positioning India as a leader in bio-mobility.

At the event, Shri Hardeep Singh Puri emphasized India's robust economic growth, predicting it will drive 25% of global energy demand over the next two decades. He noted that bioenergy will be crucial in meeting this demand while advancing climate goals and rural development. Currently valued at US$44 billion (as per Wood Mckenzie), the Minister said that the bioenergy market is projected to grow to US$125 billion by 2050. If global net-zero targets are achieved, this figure could surge to US$500 billion.

Underscoring India's agricultural strength and its vast biomass potential as critical elements in the country's transition to clean energy, Shri Puri said that the country recognized as an agricultural powerhouse, is a leading producer of rice, wheat, cotton, sugar, and various horticultural and dairy products. He said that the country has more than 750 million metric tonnes of available biomass, with about two-thirds being used for domestic purposes such as cattle feed and compost fertilizer. According to a report by PWC, he noted, 32% of India's total primary energy consumption is derived from biomass, and over 70% of Indians rely on it for energy across the value chain.

India's position as a major biofuel producer and consumer has been strengthened through coordinated policies, political support, and abundant feedstocks, said Shri Hardeep Singh Puri. He noted that the

International Energy Agency (IEA) forecasts a growth potential of 3.5 to 5 times for biofuels by 2050 due to Net Zero targets, presenting a substantial opportunity for India. The Global Biofuels Alliance (GBA) aims to facilitate knowledge sharing, technological advancement, and policy development, unlocking a $500 billion opportunity in biofuels and accelerating global adoption through technology transfer. He said that the government initiatives, such as the Indian Solar Alliance (ISA) and GBA, aim to accelerate the transition to cleaner energy sources, reduce import dependency, save foreign exchange, promote a circular economy, and move toward a self-reliant energy future.

The Minister also referred to different incentives introduced by government to support ethanol production.

Shri Puri also highlighted India's collaboration with Brazil, emphasizing the importance of joint efforts in sustainable bioenergy and biofuels to enhance energy security and reduce carbon emissions, particularly in hard-to-decarbonize sectors like aviation and shipping.

In his concluding remarks, Shri Hardeep Singh Puri emphasized that the responsibility for fuelling India's green growth extends beyond the government to include industry leaders, researchers, innovators, and citizens. He urged all stakeholders to collaborate boldly to establish a sustainable bioenergy sector that meets energy needs and sets a global standard.

Petroleum Minister Hardeep Puri Highlights India's Petrochemical Potential at India Chem 2024

The market size of the Indian Chemicals and Petrochemicals sector is expected to grow to approximately USD 300 billion by 2025, up from its current market size of USD 220 billion, said Shri Hardeep Singh Puri while addressing the 'Roundtable on Petrochemical' during India Chem 2024. He said that the demand for chemicals is predicted to nearly triple and the petrochemicals industry in India may reach US$1 trillion by 2040.

Addressing industry leaders, Shri Hardeep Singh Puri highlighted the vast potential of India's petrochemical sector. With annual consumption between 25 to 30 million tonnes, India stands as Asia's third-largest economy, exhibiting a per capita consumption significantly lower than developed nations. This gap presents ample opportunities for demand growth and investment.

As the sixth-largest chemicals producer globally and third in Asia, India exports chemicals to over 175 countries, accounting for 15% of its total exports. Shri Puri emphasized that chemicals and petrochemicals will drive global oil demand growth, with India's integrated petrochemical capacity linked closely to its expanding refining capabilities. Projections indicate an increase from 257 MMTPA to 310 MMTPA by 2028, enhancing cost competitiveness.

The government, alongside PSUs like ONGC and BPCL and private players like Haldia Petrochemicals, is committed to significant investments, with nearly USD 45 billion in petrochemical projects underway. An additional USD 100 billion is projected to meet rising demand, aligning with India's transition to a lower-carbon future.

In the address, the Minister, spoke about a substantial rise in India's petrochemical capacity, projected to increase from approximately 29.62 million tonnes to 46 million tonnes by 2030.

Highlighting the initiatives rolled out by government to accelerate growth within the industry, the Minister mentioned about key policies including the development of Petroleum, Chemicals and Petrochemicals Investment Regions (PCPIRs), Plastic Parks, and Textile Parks, alongside facilitating 100% Foreign Direct Investment (FDI) through automatic routes.

The growing Indian population and rapidly expanding economy are major drivers of increasing demand for petrochemical products, said the Minister. As more citizens enter the middle class, the demand for a diverse range of products—many of which are derived from petrochemicals—is set to rise significantly. Additionally, he said the government's focus on clean energy is contributing to heightened demand for petrochemical solutions.

The Minister said that the petrochemical sector in India is projected to attract investments exceeding USD 87 billion in the next decade, representing over 10% of global petrochemical growth. Under the new PCPIR Policy 2020-35, a combined investment of ₹10 lakh crore (approximately USD 142 billion) is targeted by 2025, underscoring the government's long-term vision for the industry.

The chemical industry plays a crucial role in India's economy, contributing around 6% to the GDP and generating employment for over 5 million people. India is the second-largest exporter of chemical dyes and agrochemicals globally, accounting for about 3% of global chemical sales. However, the country is also a net importer of chemicals and petrochemicals, with a dependency on imports for around 45% of petrochemical intermediates. Bridging this gap between domestic demand and supply through local production remains a priority.

Minister emphasized the pivotal role of the chemical and petrochemical industries in serving as the backbone of numerous sectors, including agriculture, electronics, infrastructure, automobiles, and textiles. With a robust focus on sustainability, the government is committed to reducing reliance on imports and enhancing infrastructure.

The specialty chemicals sector, experiencing a 12% compound annual growth rate (CAGR), is also reshaping India's economic landscape. However, a low-carbon strategy is essential for sustainable growth in the petrochemical industry.

To further enhance growth, the Minister encouraged the Indian chemical industry to learn from global chemical hubs such as the Port of Antwerp, Port of Houston, and Jurong Island. By synergizing within clusters to share feedstock, achieve economies of scale, and create common facilities for innovation and skill development, the industry can accelerate its development.

With a strong starting point and supportive government policies, Shri Puri said India has the potential to become the next global chemicals manufacturing hub. He expressed confidence that with collaboration from domestic and international investors, the petrochemical sector will contribute to India's goal of becoming a $5 trillion economy and achieving "Viksit Bharat" status by 2047.

India Demonstrates Green Hydrogen Mobility Advancements to Bhutan's Leadership

In a significant step towards promoting sustainable transportation solutions, Shri Hardeep Singh Puri, Minister of Petroleum & Natural Gas, showcased India's advancements in green hydrogen mobility by demonstrating a hydrogen-fuelled bus powered by IndianOil to Prime Minister of Bhutan, Shri Tshering Tobgay and his delegation.

The event was attended by Shri V Satish Kumar, Chairman & Director (Marketing), along with other senior dignitaries from the Ministry of Petroleum & Natural Gas.

During the demonstration, Shri Puri remarked, “India’s strides in green hydrogen are a testament to our commitment to sustainable energy solutions. We are eager to extend our expertise and collaborate with regional partners like Bhutan to pave the way for a cleaner, greener future. With projects about hydrogen blending in natural gas pipelines, localization of electrolyzer-based technologies, and promotion of bio-pathways for green hydrogen production being pursued aggressively, India will be a global champion in the production & exports of H2 & is set to emerge as the Hub for green hydrogen which is deemed as the fuel for future with immense potential in helping India meet it’s decarbonization targets.”

The visit highlighted the shared vision between India and Bhutan for advancing green energy initiatives. Bhutan's delegation expressed keen interest in adopting green hydrogen mobility, which aligns with the country’s commitment to environmental sustainability and clean energy solutions.

IndianOil has been a pioneer in hydrogen research since 2004, initially focusing on hydrogen-CNG blends. Over the past five years, IndianOil has ramped up its green hydrogen initiatives, with projects spanning storage, transportation, and various applications. Notably, India's first hydrogen dispensing station is operational at IndianOil's R&D Centre in Faridabad, and a collaboration with Tata Motors has led to the development and operation of green hydrogen fuel cell buses.

Currently, eight fuel cell buses—including one each for the Indian Army and Indian Navy—are operational in the Delhi NCR region, with an additional four buses deployed in Vadodara, refueled at IndianOil’s hydrogen dispensing station. IndianOil's leadership in advancing green hydrogen solutions reinforces its pioneering role in the evolving sphere of eco-friendly transportation.

India to Develop Roadmap Post-20% Ethanol Blending Target, Says Minister Hardeep Singh Puri at G-STIC Conference

Addressing the 7th G-STIC Delhi Conference on “Accelerating Technologies Solutions for the SDGs,” Shri Hardeep Singh Puri, Minister of Petroleum and Natural Gas, articulated India’s evolving journey towards sustainable energy solutions. Highlighting the potential for these technological advancements to be replicated across the Global South, Shri Puri provided insights into the complexities of energy transitions within democratic frameworks, emphasizing that there is no clear answer to whether these transitions are inherently easier or more difficult in democracies.

The 7th G-STIC (Global Sustainable Technology and Innovation Community) Conference organized by TERI and VITO along with the support of eight other not-for-profit independent technology research institutes, is being hosted in India for the first time. The Conference will deliberate on challenges under the umbrella theme "Harmonizing Technology, Policy and Business Pathways for Sustainable Future and Coexistence".

Speaking at the inaugural session of the Conference, Shri Hardeep Singh Puri discussed the critical trilemma that democratically elected governments face globally: balancing affordability, availability, and sustainability in energy policy. He pointed out that as global energy demand rises, India's own energy consumption is projected to increase significantly—from 5.4 million barrels per day today to an anticipated 7 million barrels per day by 2030. This growing demand positions India as a major contributor to global energy consumption, with projections indicating that 25% of the increase in global energy demand over the next two decades will originate from India alone.

Affordability remains a primary concern in addressing this energy transition. The Minister emphasized the government's commitment to research and development, citing innovative solutions such as hydrogen fuel cell technology being piloted in public transport. Currently, India is operating 15 hydrogen-powered buses, which are still in the demonstration phase. These initiatives reflect a broader vision for sustainable transport solutions that can contribute to reducing the carbon footprint.

A highlight of the address was the substantial progress made in ethanol blending, which has surged from just 1.53% in 2013-14 to 16% today. This achievement has prompted the government to advance its blending target of 20% from 2030 to 2025, showcasing a proactive approach to energy sustainability. Shri Puri noted that discussions have already begun to establish a roadmap for sustainable energy solutions beyond the 20% blending target, indicating a forward-thinking strategy that anticipates future energy needs.

The Minister stressed the need for addressing the energy requirements of developing nations, particularly in the Global South, where many countries rely heavily on energy imports. He expressed confidence that the success of India's ethanol initiatives could serve as a model for these regions, although he acknowledged that unlike Brazil, India lacks the luxury of abundant arable land for biofuel production. Nevertheless, he emphasized the potential for innovative biofuel strategies to alleviate import dependency while addressing local energy needs.

The Minister also highlighted the transformative impact of the Ujjwala scheme, launched in 2016, which has significantly expanded access to cooking gas. The number of cylinder connections has increased from 140 million to 330 million, providing clean cooking fuels to economically weaker sections of society. This initiative, along with other social schemes of Government, has played a crucial role in lifting approximately 250 million people out of multidimensional poverty under Prime Minister Narendra Modi's leadership.

In his concluding remarks, Shri Hardeep Singh Puri focused on the potential of green hydrogen as a game-changer for India's energy landscape. He outlined the importance of local demand, production, and consumption in making green hydrogen a viable energy source. The key challenge remains in reducing the cost of production, and he called for ongoing innovation and scaling of technology in this sector.

AI to be instrumental in realizing Prime Minister's vision of a "Viksit Bharat" by 2047: Minister Hardeep S Puri at ENRich 2024

Addressing the ENRich 2024, KPMG's Annual Innovation and Energy Conclave, Shri Hardeep Singh Puri, Minister of Petroleum and Natural Gas, underscored the pivotal role of artificial intelligence (AI) in transforming the energy sector. With the theme "AI for Energy," the Minister described the convergence of AI and energy as both timely and transformative, marking a critical step in shaping the future of the industry. He emphasized that AI is set to revolutionize operations, drive efficiency, and accelerate the shift towards a more sustainable energy landscape.

The Minister highlighted how AI is rapidly being adopted across industries and will be instrumental in realizing the Prime Minister's vision of a "Viksit Bharat" by 2047.

Focusing on the oil and gas sector, Shri Puri shared how AI and generative AI (GenAI) are optimizing operations by leveraging real-time data and insights. He pointed out that international oil companies are making significant investments in AI to enhance operational efficiency, improve safety, and contribute to the transition towards a low-carbon future.

Shri Puri noted that the Indian Public Sector Undertakings (PSUs) in the energy domain are also harnessing AI and Machine Learning (ML) to improve safety, security, and operational efficiencies at various locations. Through advanced tools like demand forecasting, customer analytics, and pricing analytics, AI is enhancing the overall customer experience in the energy sector.

In the upstream oil and gas sector, the Minister said, AI-enabled mechanisms such as deep learning are being used to analyze complex seismic data for identifying potential hydrocarbon reservoirs. Additionally, he said, AI-based prediction of drilling complications and real-time optimization of drilling parameters has proven effective in improving drilling efficiency and reducing operational costs.

Shri Puri noted the comprehensive integration of AI tools across the energy value chain, from upstream exploration and production to midstream storage and downstream refining and distribution. He observed that this shift marks a departure from the traditional engineering mindset that has long dominated the industry.

As an example, he pointed to the modernization of India's National Data Repository, now upgraded to a cloud-based platform. This platform supported by a government investment of Rs. 7,500 crore, enables instant access to seismic and production data, he noted.

Citing research by J.P. Morgan, the Minister discussed the potential of generative AI to increase global GDP by $7–10 trillion over the next three years, leading to a major boost in workforce productivity and reshaping the global economy.

Shri Puri further emphasized that India, with its growing economy, youthful population, and thriving tech ecosystem, is poised to benefit greatly from AI. Reports suggest that AI adoption could contribute at least Rs. 33.8 lakh crore to India's economy by 2030, he said.

He also highlighted the success of the Universal Connectivity and Digital India initiatives, which have driven a dramatic increase in internet subscribers from 251.59 million in 2014 to 954.40 million in 2024, achieving a CAGR of 14.26%.

The Minister applauded KPMG's efforts to foster entrepreneurship and support the start-up ecosystem through initiatives like "ENRich Labs" for innovation and co-creation with the industry.

Highlighting India's booming start-up ecosystem, the Minister noted that India is now the world's third-largest hub for unicorn start-ups, following the USA and China, with a combined valuation of approximately USD 350 billion. He emphasized that these start-ups are reshaping the Indian economy and transforming markets.

Stressing on the oil and gas sector, Shri Puri shared that Oil and Gas PSUs have set up startup funds totaling Rs. 505 crore. So far, 287 start-ups have received funding, with Rs. 271 crore already disbursed to promote innovation and growth in the sector.

The Minister also talked about the Avinya'25, launched recently based on the overwhelming success of Avinya'24. The initiative aims to encourage entrepreneurs, researchers, academicians, and students to propose innovative solutions that can shape the future of the energy sector. The application period for Avinya'25 opened on 30th September 2024, with a submission deadline of 2nd December 2024. Shri Puri urged everyone to actively participate and contribute to the event's success

Shri Puri concluded by urging stakeholders to explore the untapped potential in India's energy sector, stressing the importance of sustainable business practices that align with societal and environmental goals.

Cabinet approves India to Join International Energy Efficiency Hub by signing the Letter of Intent

The Union Cabinet chaired by the Prime Minister Shri Narendra Modi has approved the signing of 'Letter of Intent' thus enabling India to join the 'Energy Efficiency Hub'.

India will join the International Energy Efficiency Hub (Hub), a global platform dedicated to fostering collaboration and promoting energy efficiency worldwide. This move solidifies India's commitment to sustainable development and aligns with its efforts to reduce greenhouse gas emissions.

Established in 2020 as the successor to the International Partnership for Energy Efficiency Cooperation (IPEEC), in which India was a member, the Hub brings together governments, international organizations, and private sector entities to share knowledge, best practices, and innovative solutions. By joining the Hub, India will gain access to a vast network of experts and resources, enabling it to enhance its domestic energy efficiency initiatives. As of July, 2024, sixteen countries (Argentina, Australia, Brazil, Canada, China, Denmark, European Commission, France, Germany, Japan, Korea, Luxembourg, Russia, Saudi Arabia, United States and United Kingdom) have joined the Hub.

As a member of the Hub, India will benefit from opportunities for collaboration with other member states, sharing its own expertise and learning from international best practices. The country will also contribute to global efforts to address climate change by promoting energy-efficient technologies and practices.

Bureau of Energy Efficiency (BEE), the statutory agency, has been designated as the implementing agency for the Hub on behalf of India. BEE will play a crucial role in facilitating India's participation in the Hub's activities and ensuring that India's contributions align with its national energy efficiency goals.

By joining the Hub, India is taking a significant step towards more sustainable future. The country's participation in this global platform will help to accelerate the transition to a low-carbon economy and improve energy security.

Shri Manohar Lal addresses Brainstorming Session on the Indian Power Sector Scenario 2047

Union Minister Shri Manohar Lal addressed Brainstorming Session on the Indian Power Sector Scenario 2047 in New Delhi. At the two-day Brainstorming Session on the Indian Power Sector Scenario 2047 Union Minister for Power and Housing & Urban Affairs, Shri Manohar Lal, outlined the government's strategy to meet the country's burgeoning energy needs while transitioning to cleaner sources of power.

"By 2047, we anticipate our power demand to reach 708 gigawatts. To meet this, we need to increase our capacity by four times, i.e. 2,100 gigawatts," Union Minister Manohar Lal stated, highlighting the scale of the challenge ahead. "This is not just about increasing capacity; it's about reimagining our entire energy landscape."

The Union Minister emphasised the critical role of renewable energy in India's future power mix. "We have set an ambitious target of 500 GW of non-fossil energy capacity by 2030, effectively doubling our current capacity," he said. This push towards green energy aligns with India's commitment to reducing carbon emissions by one billion tonnes by 2030 and achieving net-zero emissions by 2070.

Shri Manohar Lal praised the CEA for its pivotal role in shaping the sector's future, citing the National Electricity Plan, which was launched at the session. "This plan will provide crucial guidance to state governments and investors, fostering a collaborative approach to sector development," he noted.

The National Electricity Plan (Transmission), developed in consultation with various stakeholders, outlines a comprehensive strategy to achieve the government's energy transition goals. It details the transmission infrastructure required to support 500 gigawatts of renewable energy capacity by 2030, increasing to over 600 gigawatts by 2032. The plan incorporates innovative elements such as the integration of 10 gigawatts of offshore wind farms, 47 gigawatts of battery energy storage systems, and 30 GW of pumped storage plants. It also addresses the power needs of green hydrogen and green ammonia manufacturing hubs, and includes cross-border interconnections. With a planned addition of 190,000 circuit kilometres of transmission lines and 1,270 GPA of transformation capacity over the next decade, the plan presents an investment opportunity of over 9 lakh crore rupees in the transmission sector.

The minister also addressed the challenges of integrating variable renewable energy sources into the grid, emphasising the need for advanced storage solutions. "We are exploring innovative technologies in pump storage facilities and battery storage to ensure 24/7 power availability to our citizens," the Union Minster explained.

Recognising the transformative impact of rapid urbanisation and industrialisation on power demand, the government is focusing on grid infrastructure expansion and upgradation. The Union Minister stressed the importance of creating a skilled workforce to support this modernisation, stating, "We must develop a workforce capable of meeting the demands of a 21st-century energy system."

On occasion, Minister of State for Power and New & Renewable Energy, Shri Shripad Yesso Naik, emphasised the need for meticulous planning to align the power sector with emerging priorities. He called for a swift transition towards a diverse and cleaner energy mix, driven by ambitious sustainability targets. "Significant investment will be needed in renewable technologies, energy storage solutions and grid modernisation," Shri Naik stated. He highlighted the pivotal role of the Central Electricity Authority in shaping the sector's transformation, noting its wide-ranging responsibilities from formulating national electricity plans to setting technical standards. MoS stressed the importance of developing new skills, regulatory frameworks, and market structures to manage the evolving energy landscape, asserting that "electricity is not just a commodity, but a catalyst for growth, development and a sustainable future."

Among other speakers at the inaugural session, Shri Pankaj Agarwal, Secretary, Ministry of Power, outlined India's roadmap for a modern, energy-efficient power sector, emphasizing India's critical role in the vision of ONE SUN, ONE WORLD, ONE GRID for a sustainable future.

He underscored the multifaceted nature of energy security, stating that it encompasses three critical elements: affordability, adequacy coupled with reliability, and sustainability. He further alluded to the recent G20 New Delhi Leaders' Declaration, highlighting the ambitious targets set for the sector. "The G20 members have resolved to triple renewable energy capacity and double the rate of improvement in energy efficiency," he noted. Looking ahead to COP29, the Secretary added, "We anticipate a requirement for a sixfold increase in storage capacity." He also underlined the need for a comprehensive planning framework to meet demand optimally and securely while calling for the flexibilisation of Power Purchase Agreements and reduced power costs for consumers.

India and Bhutan to Strengthen Hydropower Cooperation: Bhutan's Minister of Energy & Natural Resources Meets Union Minister Shri Manohar Lal

Minister of Energy and Natural Resources of Bhutan, His Excellency Lyonpo Gem Tshering, met with the Union Minister of Power and Housing & Urban Affairs, Shri Manohar Lal, in New Delhi. The meeting focused on strengthening the longstanding cooperation between the two nations in the hydropower sector.

Key points of discussion included:

- Puna-1 Hydroelectric Power (HEP) Project: Both sides discussed enhancing their collaboration to further boost energy production from this project.
- Puna-2 Tariff Finalization
- Future Collaboration: The two leaders explored potential avenues for future cooperation in energy generation.

Shri Manohar Lal reaffirmed India's commitment to furthering hydropower development with Bhutan, noting that "More Power means more happiness." He assured full support to Bhutan in this critical area of collaboration, underscoring the strategic and mutually beneficial nature of these projects.

India and Bhutan share a robust partnership in the hydropower sector, with several key projects contributing significantly to Bhutan's economy and providing renewable energy to India.

This meeting marks another step forward in deepening bilateral relations and enhancing regional energy security through sustainable energy cooperation.

NTPC and Indian Army Join Hands for Round-the-Clock Power Supply using Green Hydrogen

NTPC has partnered with the Indian Army to establish a Solar Hydrogen-based Microgrid at Chushul, Ladakh. This significant step will provide a stable power supply using Green Hydrogen in off-grid Army locations. Hon'ble Defence Minister Shri Rajnath Singh laid the foundation stone of this unique project through video conferencing in the presence of Chief of India defence services, CMD, NTPC and other senior officials from Ministry of Defence, Indian Army and NTPC.

NTPC has designed this innovative Solar Hydrogen-based microgrid system to operate independently, using hydrogen as an energy storage medium to supply 200kW of power round-the-clock throughout the year. This system will replace existing diesel gensets at off-grid Army locations, providing a sustainable power supply despite harsh winter conditions, where temperatures drop to -30°C at an altitude of 4,400 meters. NTPC will maintain the project for 25 years, aiming to support Indian soldiers stationed in these strategically significant tough terrains and challenging climate.

The Solar-Hydrogen microgrid is set to replace existing diesel generators currently in use at off-grid Army locations. These systems offer numerous advantages, including the integration of renewable energy sources, a stable power supply under adverse conditions, reduced carbon emissions, and the promotion of a cleaner and sustainable energy ecosystem as they are highly scalable and suitable for various applications. Moreover, these systems combine the reliability of battery storage with the extended energy storage capability of hydrogen, ensuring a consistent power supply.

Given Ladakh's high solar irradiance and low temperatures, this project will facilitate the production and utilization of green energy, eliminating reliance on fuel logistics and enhancing self-sufficiency in remote areas affected by road connectivity disruptions. Once operational, it would usher in a new era of decarbonisation of the defence sector far off the Himalayas.

Additionally, NTPC started a trial run of a hydrogen bus in Leh recently towards achieving its renewable energy targets and carbon neutrality in Ladakh. The company is further setting up a hydrogen fuelling station and solar plant along with five fuel cell buses for operation on intracity routes in Leh.

India stands as a global voice of reason in its commitment to the pursuit of a sustainable energy future: Shri Pralhad Joshi

Emphasizing India's significant progress in green shipping and energy transition, Union Minister of New and Renewable Energy, Shri Pralhad Joshi, delivered the keynote address at the Hamburg Sustainability Conference in Germany on 7th October 2024. The Minister remarked that that India stands as a global voice of reason in its commitment to the pursuit of a sustainable energy future that aligns with our growth ambitions and environmental responsibilities.

Addressing the conference, Union Minister highlighted India's energy transition and noted that India has achieved significant milestones in its shift to renewable energy. "India is the only G20 country to have met its climate targets ahead of schedule, despite having the lowest per capita emissions among G20 nations," he remarked. He emphasized that energy security and access remain paramount for India, but this has never hindered the nation's commitment to energy transition on both national and global scales.

In this address, Union Minister Joshi noted that under the leadership of Prime Minister Narendra Modi, India has witnessed a transformative increase in its renewable energy capacity since 2014, with a 175% rise from 75 GW to over 208 GW today. Total RE increased from 193.5 billion units to 360 BU, marking an 86% rise during this period. Solar energy capacity has also grown 33 times in the last 10 years. Shri Joshi also emphasized that International Solar Alliance, supported by over 100 countries, demonstrates India's leadership in global efforts to combat climate change through solar energy.

The Minister also drew attention to India's cultural heritage, noting that the concept of sustainability is deeply rooted in Indian tradition. He recited the Gayatri Mantra from the Rigveda, underlining India's ancient belief in the harmony between mankind and nature.

Green Shipping Initiatives:

Addressing the theme of Green Shipping, Shri Joshi emphasized the crucial role of the maritime sector in global trade and its impact on greenhouse gas emissions. He stated, "As we progress towards achieving net-zero emissions, the necessity for sustainable maritime transport has become very important. India is making significant strides in the green shipping sector, driven by government initiatives, technological advancements, and international collaborations."

The Minister detailed how Indian shipyards are being modernized and older dockyards are being evaluated for reopening to expand green shipbuilding capacity. "India is becoming a promising hub for green shipbuilding," he noted, citing the government's strong emphasis on alternative fuels and renewable energy sources like biofuels and wind power. India is upgrading its port infrastructure to support green shipping fuels and vessels using hybrid models, with the goal of ranking among the top five shipbuilding nations by 2047.

The National Green Hydrogen Mission (NGHM), launched with an outlay of $2.4 billion, aims to produce 5 million metric tonnes (MMT) of green hydrogen annually by 2030, attracting over $100 billion in investments and creating more than 6 lakh jobs. He also invited international stakeholders to collaborate in India's ambitious green hydrogen and renewable energy projects.

Pilot projects under the NGHM, with an investment of $14 million, are already exploring the use of green hydrogen in the shipping sector. "We are focusing on converting existing vessels to operate on green hydrogen or its derivatives. The Shipping Corporation of India is currently converting two vessels to run on green methanol," the Minister explained. India with an investment of approximately $25 million, is setting the stage for development of hydrogen hubs that will transform its energy landscape. Moreover, ports such as Deendayal, Paradip, and V.O. Chidambaranar are being developed into key hydrogen hubs with bunkering and refuelling facilities to support green hydrogen-powered ships.

Shri Pralhad Joshi concluded his address by reaffirming that, "India's embrace of innovative technologies, investment in robust infrastructure, and cultivation of international cooperation have elevated us from a mere participant to a leading force in this global transition."

MNRE notifies Scheme Guidelines for ₹500 crore 'Innovative Projects' component under PM-Surya Ghar Yojana

Union Ministry of New and Renewable Energy has notified Scheme Guidelines for implementation of 'Innovative Projects' under PM-Surya Ghar: Muft Bijli Yojana on 8th October 2024.

Under the scheme component 'Innovative Projects', ₹500 crore has been earmarked to encourage advancements in rooftop solar technologies, business models, and integration techniques. The component seeks to identify and support startups, institutions, and industries in piloting new concepts, with a focus on emerging solutions like blockchain-based peer-to-peer solar trading, smart materials, and rooftop solar integrated with electric vehicles and battery storage.

To drive this forward, MNRE will invite proposals and encourage joint research and international collaborations. National Institute of Solar Energy (NISE) will serve as the Scheme Implementation Agency (SIA) for the Innovative Projects Component. Selected projects will receive financial assistance of up to 60% of the project cost or ₹30 crore, whichever is lower. Additionally, annual awards for innovation will be granted to encourage further advancements, with prizes up to ₹1 crore.

The Government of India approved the PM-Surya Ghar: Muft Bijli Yojana on 29th February 2024, with the aim to increase the share of solar rooftop capacity and empower residential households to generate their own electricity. The scheme has an outlay of Rs 75,021 crore and is to be implemented till FY 2026 - 27.

India's Renewable Energy Capacity Hits 200 GW Milestone

India has reached a significant milestone in its renewable energy journey, with the country's total renewable energy capacity crossing the 200 GW (gigawatt) mark as of October 10, 2024. According to the Central Electricity Authority, the total renewable energy-based electricity generation capacity now stands

at 201.45 GW. This achievement underscores India's growing commitment to clean energy and its progress in building a greener future.

This milestone reflects the result of years of dedicated efforts to harness India's natural resources. From sprawling solar parks to wind farms and hydroelectric projects, the country has steadily built a diverse renewable energy base. These initiatives have not only reduced reliance on fossil fuels but also strengthened the nation's energy security. When factoring in the 8,180 MW (megawatt) of nuclear capacity, the total non-fossil fuel-based power now accounts for almost half of the country's installed electricity generation capacity, signalling a strong move toward clean energy leadership on the global stage.

India's total electricity generation capacity has reached 452.69 GW, with renewable energy contributing a significant portion of the overall power mix. As of October 2024, renewable energy-based electricity generation capacity stands at 201.45 GW, accounting for 46.3 percent of the country's total installed capacity. This marks a major shift in India's energy landscape, reflecting the country's growing reliance on cleaner, non-fossil fuel-based energy sources.

A variety of renewable energy resources contribute to this impressive figure. Solar power leads the way with 90.76 GW, playing a crucial role in India's efforts to harness its abundant sunlight. Wind power follows closely with 47.36 GW, driven by the vast potential of the coastal and inland wind corridors across the country. Hydroelectric power is another key contributor, with large hydro projects generating 46.92 GW and small hydro power adding 5.07 GW, offering a reliable and sustainable source of energy from India's rivers and water systems.

Biopower, including biomass and biogas energy, adds another 11.32 GW to the renewable energy mix. These bioenergy projects are vital for utilizing agricultural waste and other organic materials to generate power, further diversifying India's clean energy sources. Together, these renewable resources are helping the country reduce its dependence on traditional fossil fuels, while driving progress toward a more sustainable and resilient energy future.

Several states in India have emerged as leaders in renewable energy capacity, contributing significantly to the nation's progress. Rajasthan tops the list with an impressive 29.98 GW of installed renewable energy capacity, benefiting from its vast land and abundant sunlight. Following closely is Gujarat, which boasts a capacity of 29.52 GW, driven by its strong focus on solar and wind energy projects. Tamil Nadu ranks third with 23.70 GW, leveraging its favourable wind patterns to generate substantial energy. Karnataka rounds out the top four with a capacity of 22.37 GW, supported by a mix of solar and wind initiatives. Together, these states play a crucial role in advancing India's renewable energy goals and establishing a more sustainable energy future.

The Government of India has implemented a range of measures and initiatives aimed at promoting and accelerating renewable energy capacity across the nation, with an ambitious target of achieving 500 GW of installed electric capacity from non-fossil sources by 2030. Key programs include the National Green Hydrogen Mission, PM-KUSUM, PM Surya Ghar, and PLI schemes for solar PV modules.

RE sector set to dominate Indian power industry in the coming years: MNRE Secretary Shri Prashant Kumar Singh

The renewable energy sector is set to dominate the Indian power industry in the coming years, stated Shri Prashant Kumar Singh, Secretary of the Ministry of New and Renewable Energy. He was speaking at the Brainstorming Conclave organized by the Central Electricity Authority on the Indian Power Sector Scenario by 2047 in New Delhi. He mentioned that RE capacity, which was 76 GW in 2014, is now almost 210 GW, and achieving 500 GW by 2030 is within reach.

Shri Prashant Kumar Singh highlighted that a major part of this growth in RE will come from the solar sector. Solar capacity has surged from a mere 2.6 GW in 2014 to an impressive 91 GW today, with projections indicating it could reach close to 300 GW by 2030. Initiatives such as PM Surya Ghar and PM KUSUM are driving this demand, complemented by rapid advancements in manufacturing capabilities. Solar power module manufacturing, which stood at 2 GW in 2014, has surged to 60 GW and is expected to surpass 100 GW by 2030.

He also highlighted the excellent growth of the solar cell manufacturing sector from 1 GW in 2014 to an estimated 8-10 GW today. By the end of March 2025, it is projected to reach 20 GW, with a target of over 70 GW by 2030. Between 2014 and 2023, investments in the RE sector have totalled ₹8.5 lakh crore. At the recent ReInvest event of MNRE, financial institutions, including public sector banks, pledged ₹25 lakh crore in support of RE projects through 2030.

Secretary Shri P.K. Singh also emphasized the importance of initiatives such as the Production-Linked Incentive (PLI) scheme and the Green Hydrogen Mission in the RE sector. He urged the industry to collaborate on advancing the Green Hydrogen sector in the country. India has set a target of 7.7 metric tonnes of green hydrogen by 2030, alongside establishing 15 GW of electrolyser capacity. Shri Singh also noted advancements in research and development, highlighting the National Physical Laboratory's development of a reference solar cell—a significant milestone for the sector.

The Brainstorming Conclave by the Central Electricity Authority on the Indian Power Sector Scenario by 2047 was inaugurated by Union Minister of Power Shri Manohar Lal Khattar in New Delhi. Union Minister of State for Power & New and Renewable Energy Shri Shripad Y. Naik also addressed the event. The conclave involves policymakers, government leaders, ministers, senior officials from Central and State Governments, industry experts, distinguished guests, and other stakeholders. The event aims to provide a unique platform for knowledge exchange, networking, and collaboration towards a sustainable and resilient power sector.

Launch of Pilot projects in Steel Sector under the National Green Hydrogen Mission

As part of National Green Hydrogen Mission, the Union Government has sanctioned three pilot projects for use of Hydrogen in steel production. Earlier the Ministry of New and Renewable Energy had issued guidelines for Implementation of Pilot projects in Steel Sector under this Mission.

The objectives of the scheme were to identify advance technologies for utilizing green hydrogen in steelmaking, through pilot projects. These pilot projects can demonstrate safe and secure operations of green hydrogen-based steel making processes, validating technical feasibility and performance, evaluating their economic viability thereby leading to low-carbon iron and steel production. Accordingly, the proposals were invited for three components (i) Pilot project to produce DRI using 100 % Hydrogen using vertical shaft, (ii) Use of Hydrogen in Blast Furnace to reduce coal/ coke consumption and (iii) Injection of Hydrogen in vertical shaft based DRI making unit.

Based on the evaluations of the proposals received, the Ministry of New and Renewable Energy has sanctioned total three pilot projects in the steel sector, (a) Matrix Gas and Renewables Ltd (Consortium members: Gensol Engineering Ltd, Indian Institute of Technology Bhubaneswar, Metsol AB, Sweden) with pilot plant capacity 50 ton-per-day (TPD), (b) Simplex Castings Ltd (Consortium member: BSBK Pvt. Ltd., Ten Eight Investment, IIT Bhilai) with pilot plant capacity 40 TPD and (c) Steel Authority of India Ltd (Ranchi) with plant capacity 3200 TPD.

The total financial support made available will be Rs. 347 Crore from the Government of India. These pilot projects are likely to be commissioned in next 3 years, paving way to the scaleup of such technologies in India.

****

Research, analysis & compilation by:

Economic Policy & Planning Team - FIPI

Email: pankhuri@fipi.org.in