FIPI

Federation of Indian Petroleum Industry

MAY 2022

Policy & Economic Report

Oil & Gas Market

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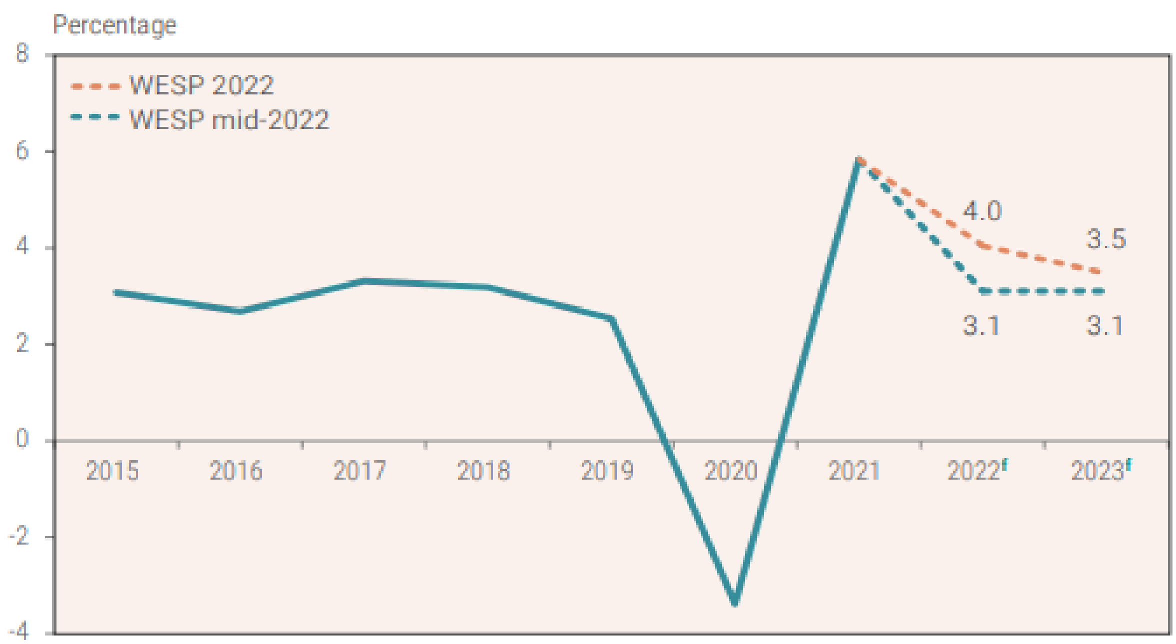
Executive Summary

Global growth prospects have weakened significantly amid the war in Ukraine, rising energy, food and commodity prices, soaring inflation and tightening monetary policy stances by major central banks.

According to UN's World Economic Situation and Prospects, the world economy is projected to grow by 3.1 % in 2022, marking a downward revision of 0.9 % points from our previous forecast released in January 2022.

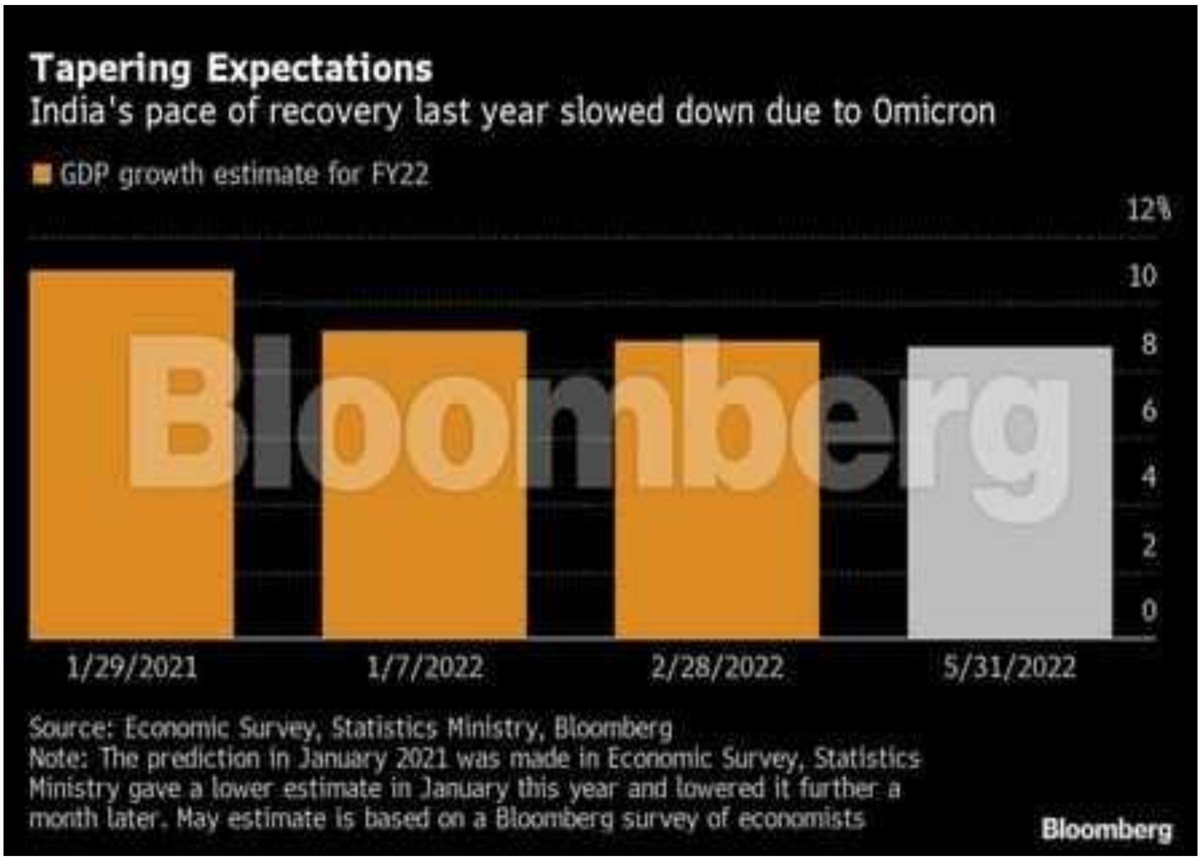
The European Union economy which is most directly hit by disruptions in the energy supply from the Russian Federation is expected to grow by 2.7 per cent in 2022, down from 3.9 per cent expected in January. The United States economy is expected to grow by 2.6 per cent in year 2022 due to high inflationary pressures, aggressive monetary tightening by the Federal Reserve and a strong US dollar, worsening net export balances. The Russian Federation's economy is projected to contract by about 10 % in 2022, due to unprecedented trade and financial sanctions put up in March. China is expected to grow by 4.5 per cent in 2022 as stringent zero COVID-19 policies adversely affecting growth prospects.



Source- UN

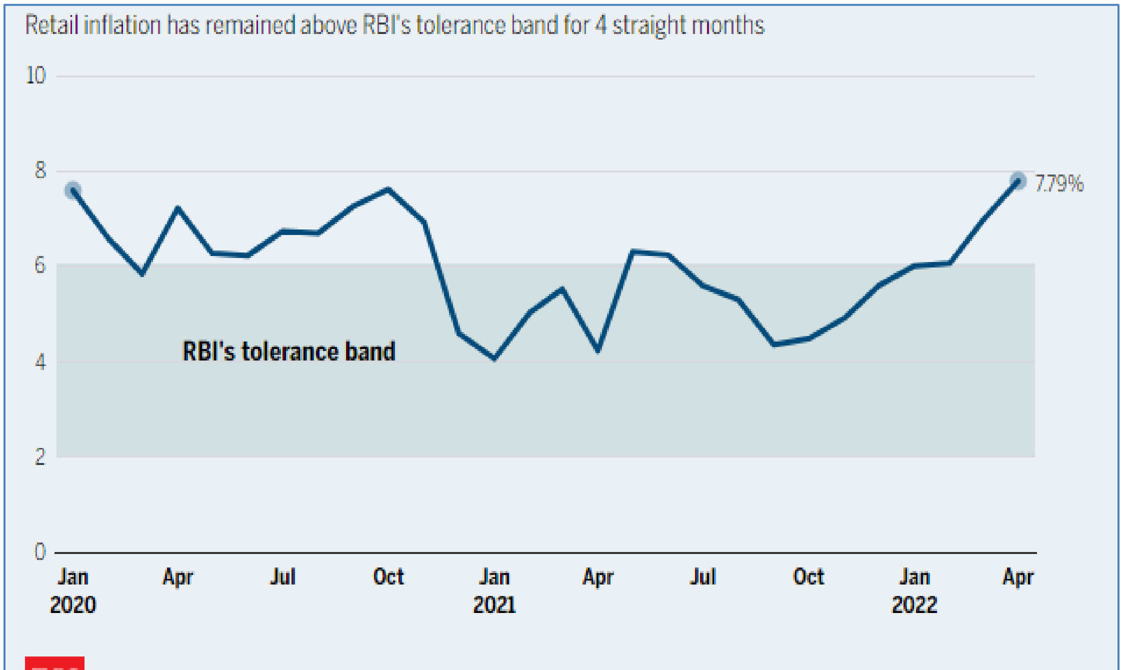
According to U.N., global inflation is projected to increase to 6.7 per cent in 2022, twice the average of 2.9 per cent during 2010—2020. Headline inflation in the United States has reached the highest level in four decades. Supply disruptions have resulted in rising inflationary pressures in the US, touching a 40-year high to 8.3 % last month. In Europe, prices have increased by 7.5 per cent in April'2022. Inflation is started to pick up in Asia, as a result of higher commodity prices, Russia-Ukraine war and slower growth in China due to spike in Covid cases. Further, the US Federal Reserve's expected steady interest rates hikes also pose a risk to Asia's economic growth as there is huge involvement of region's dollar denominated debt.

According to the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, India's economy grew by 4.1 per cent in the fourth quarter of 2021-22, pushing up the annual growth rate to 8.7 per cent. The nominal GDP grew by 19.5% in the financial year 2021-22. The numbers have come down from the official second advance estimate of 8.9% released in February owing to third-wave of Covid-19 and surging global prices.



For FY 2023, RBI had revised the GDP growth rate to 7.2%, from 7.8%, in its April resolution due to higher oil prices causing a threat to private consumption. Various factors determine India's GDP growth rate. Domestic economic activity stabilized in March-April with the ending of third wave of COVID-19 and the easing of restrictions. Urban demand appears to have maintained expansion. Investment activity have been on a rise with improving capacity utilization, stronger corporate balance sheets and better financial conditions. Merchandise exports recorded double digit expansion for the fourteenth consecutive month in April. Non-oil non-gold imports also grew robustly on the back of improving domestic demand.

According to the data released by the National Statistics Office (NSO), inflation in April was a record-breaking 7.7 per cent, which is almost double the rate that the RBI must maintain, for smooth functioning of the economy. The Wholesale Price-based Index (WPI) also saw an increase from 14.5 per cent in March to 15 per cent in April.



Based on Wholesale Price Index (WPI) and Consumer Price Index (CPI); the Reserve Bank's tolerance band is a range the central bank is tasked to keep inflation within 2-6% • Source: Ministry of Statistics, India

The Reserve Bank has continued with liquidity withdrawal in a phased manner in sync with monetary policy and macroeconomic developments. A 50 bps increase in the cash reserve ratio to 4.5% and a 40 bps increase in policy repo rate to 4.40 % signals RBI's intent on withdrawal of accommodation to ensure that inflation remains within the target, while supporting growth.

The CMIE data for May suggest that the quantum of employment continues to remain a challenge, with pressure on the labor market as the unemployment rate rose to 7.13% in the month of May 2022 with urban unemployment rate at 8.46% and the rural unemployment rate is 6.52% in May 2022.

Global Oil prices remain in a volatile state over the past month. The oil prices gain significantly, hovering above $100 per bbl as the effect of uncertainty over sanctions on Russia by the European Union have offset the demand fears as China continued with its strict lockdowns led by a spike in COVID-19 cases.

Non-OPEC liquids supply growth y-o-y in 2021 is broadly unchanged at around 0.6 mb/d. Total US liquids production is estimated to have increased y-o-y by 0.15 mb/d. The largest increases for the year were seen in Canada, which rose by 0.3 mb/d, followed by Russia and China, which are estimated to each have grown by 0.2 mb/d. In 2022, oil demand growth was revised down by 0.3 mb/d to average 3.4 mb/d y-o-y, accounting for potential declines in global GDP and the resurgence of the Omicron variant of COVID-19 in China and its impact on global oil demand. World oil demand is projected to average 100.3 mb/d, which is 0.2 mb/d lower than the previous month's estimates and approximately 0.1 mb/d higher than 2019.

U.S. natural gas prices surged to the highest level in more than 13 years as Russia's war on Ukraine causes a global energy crunch. For the year, U.S. natural gas prices are now up 219.1% from a year ago, currently trading at 8.87 $/mmbtu (2.78 $/mmbtu a year ago), which is adding to inflationary concerns across the global economy.

In Europe, Spot gas prices have soared to record highs as countries moves away from dependence on Russian energy. The natural gas spot price at the Title Transfer Facility (TTF) in the Netherlands in Europe has been trading at all-time high levels. The TTF price averaged $32.20 per MMBtu

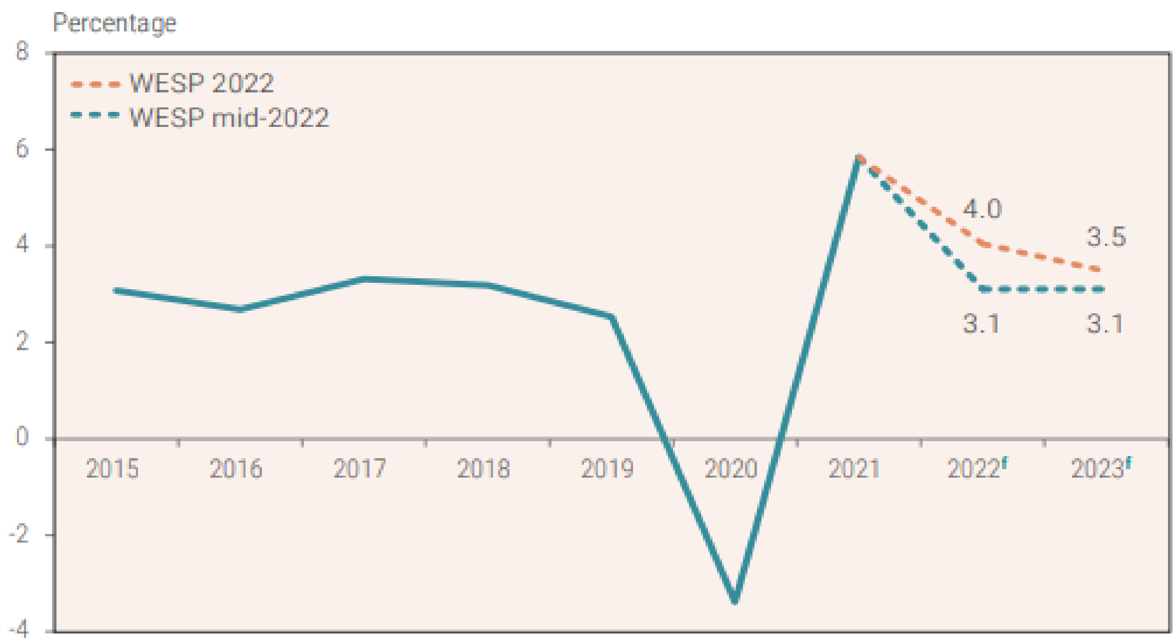
Economy in Focus

1. A snapshot of the global economy

Global economic growth

Global growth prospects have weakened significantly amid the war in Ukraine, rising energy, food and commodity prices, soaring inflation and tightening monetary policy stances by major central banks.

According to UN's World Economic Situation and Prospects, the world economy is projected to grow by 3.1 % in 2022, marking a downward revision of 0.9 % points from our previous forecast released in January 2022



Source- UN

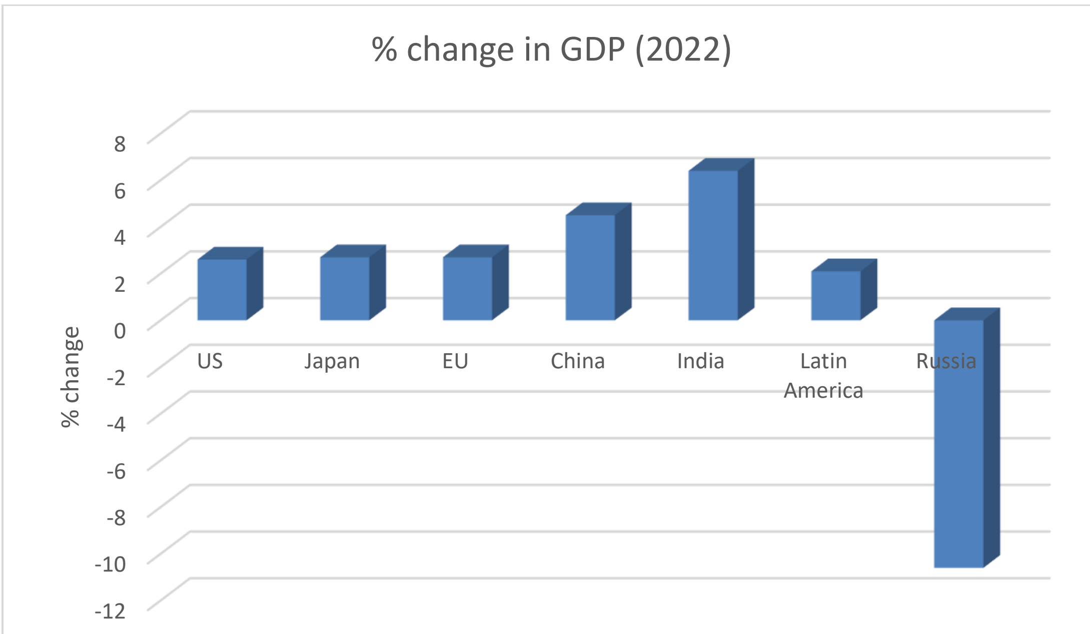
UN in its latest World Economic Situation and Prospects projections published in the month of May 2022 has forecasted the following: -

- The European Union economy which is most directly hit by disruptions in the energy supply from the Russian Federation is expected to grow by 2.7 per cent in 2022, down from 3.9 per cent expected in January.
- The United States economy is expected to grow by 2.6 per cent in year 2022 due to high inflationary pressures, aggressive monetary tightening by the Federal Reserve and a strong US dollar, worsening net export balances

- The Russian Federation's economy is projected to contract by about 10 % in 2022, due to unprecedented trade and financial sanctions put up in March.

- China is expected to grow by 4.5 per cent in 2022 as stringent zero COVID-19 policies adversely affecting growth prospects.

- The developing countries, as a group, are projected to grow by 4.1 per cent in 2022, down from 6.7 per cent in 2021.



Source- UN

The major developments taken place in various advanced and emerging regions of the world are as below:

- The war in Ukraine has triggered sharp increases in food and fertilizer prices that will hit the developing countries particularly hard, exacerbating food insecurity and increasing poverty.

- Food security concerns have also prompted countries to impose export restrictions, further constraining the supply of agricultural products and critical agricultural inputs. As a result of which, the Food and Agricultural Organization's (FAO) composite food price index reached record levels of 159.7 and 158.5 in March and April 2022, respectively, surpassing the previous high of 131.9 in 2011.

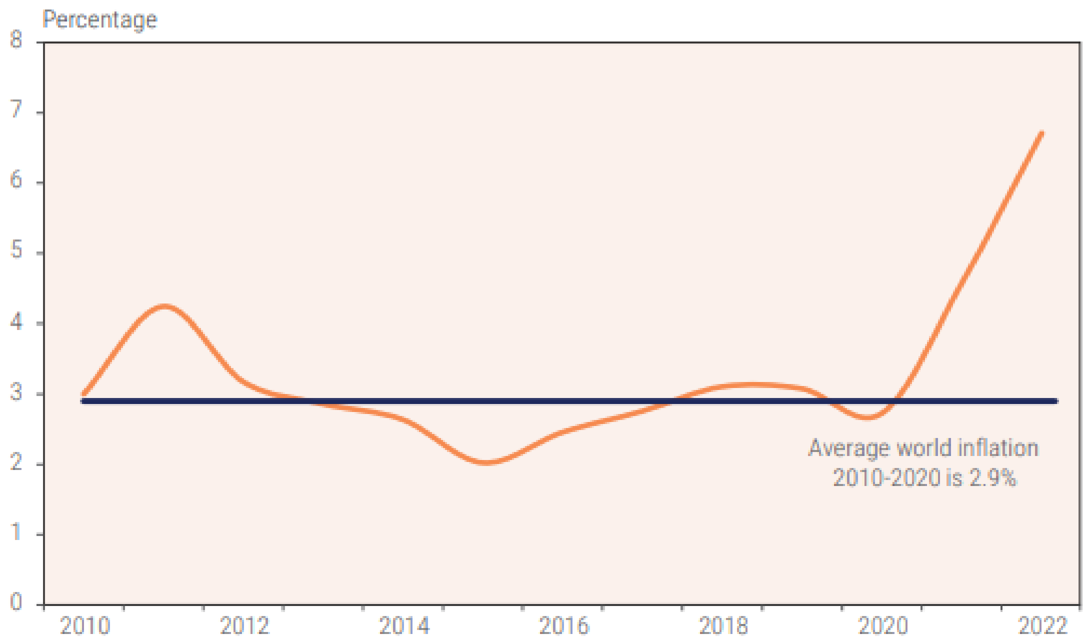
- Monetary tightening by the developed countries will increase borrowing costs, undermine debt sustainability, and further constrain the fiscal space to support a full recovery of developing country economies.

- In 2022, global trade growth is projected to slow down markedly, after a strong rebound in 2021. The conflict has disrupted exports of crude oil, natural gas, grains, fertilizer and metals, pushing up energy, food and commodity prices.

- Higher commodity prices, including base metals, have sharply increased production costs in automotive, electronics and other manufacturing sectors. The war halted the production of neon gas in Ukraine, which accounted for about half of the global output. As neon gas is a critical input for the production of semiconductors, this will worsen the semiconductor shortages, which have already negatively impacted the production of automobiles and electronics.

Global inflation

- According to U.N., global inflation is projected to increase to 6.7 per cent in 2022, twice the average of 2.9 per cent during 2010—2020.



Source- UN

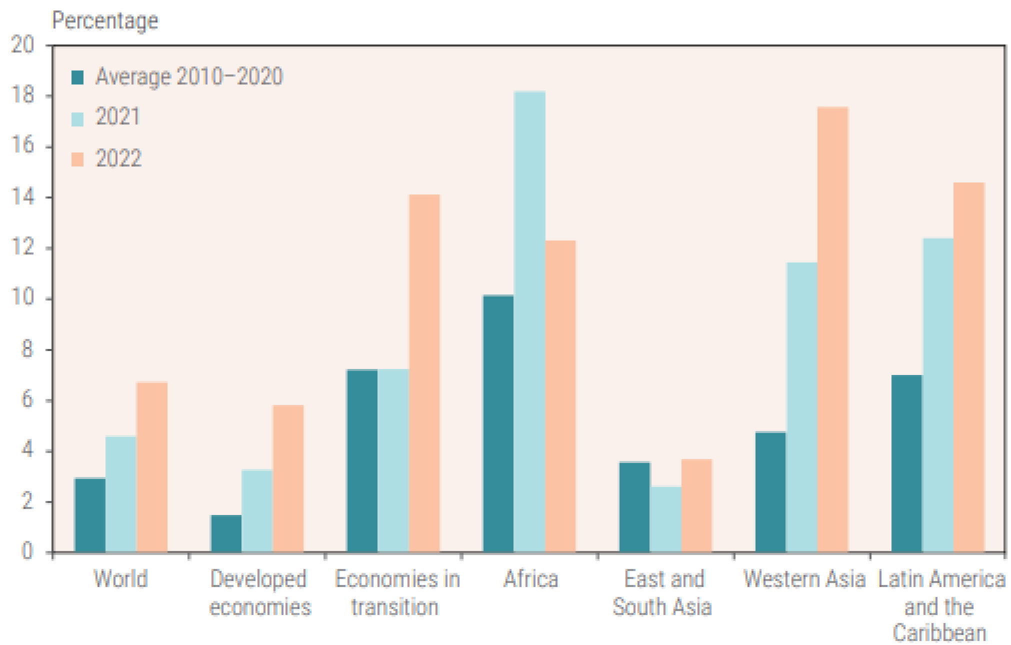
- Headline inflation in the United States has reached the highest level in four decades. Supply disruptions have resulted in rising inflationary pressures in the US, touching a 40-year high to 8.3 % last month.

- In Europe, prices have increased by 7.5 per cent in April'2022.

- Inflation is started to pick up in Asia, as a result of higher commodity prices, Russia-Ukraine war and slower growth in China due to spike in Covid cases. Further, the US Federal Reserve's expected steady interest rates hikes also pose a risk to Asia's economic growth as there is huge involvement of region's dollar denominated debt.

- Tight labor market conditions with unemployment rates at record lows and acute shortages of workers are also adding to inflationary pressures in developed countries. In the United Kingdom and the United States, inflation expectations are rising, while nominal wage growth has started catching up with overall price increases, increasing the risk of a wage-price spiral.

Annual inflation by regions



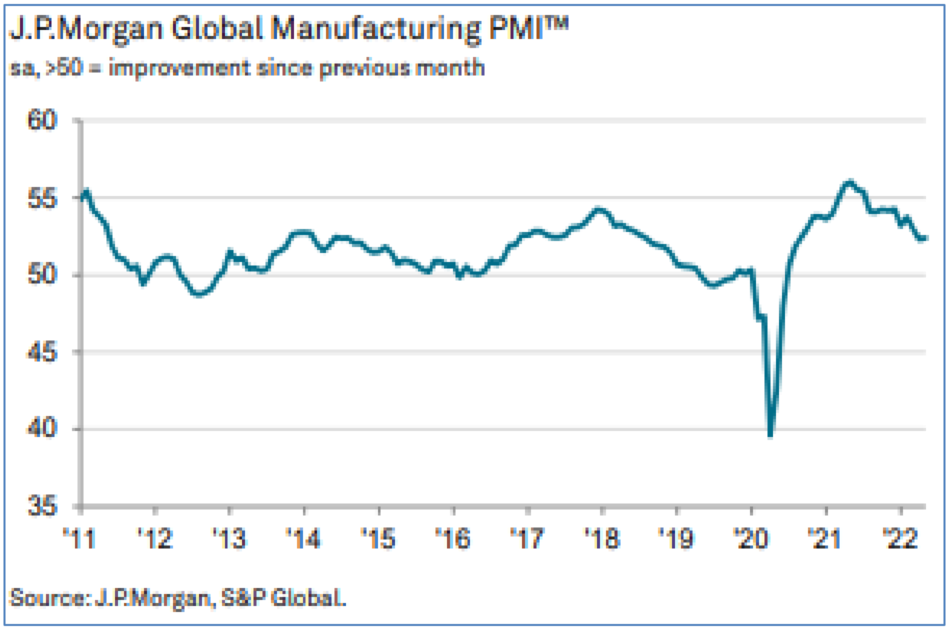
Central Bank stance on inflation

Appropriate monetary policy response has been taken by economies all over the world to curb inflation.

- The US Fed had already raised its policy interest rate by 50 basis points.
- The Bank of England (0.25%) and Bank of Canada (0.50%) has also raised its policy rates to curb inflationary pressures.

Global manufacturing output

- Global manufacturing production declined for the second successive month in May, as new order growth remained lackluster and international trade volumes contracted. Inflationary pressure was elevated, as rates of increase in input costs and selling prices stayed among the highest.
- The JPMorgan Global Manufacturing PMI – a composite index produced by JPMorgan and S&P Global posted PMI as 52.4 in May.
- Lower production volumes reflected lackluster demand, disruption from stretched supply chains, elevated inflationary pressures, the war in Ukraine and the downturn in Chinese manufacturing.



International agencies slash global GDP growth rate for FY 2023.

➢ **<u>Morgan Stanley warns 2022 global economic growth to take major blow</u>**

Morgan Stanley predicted 2022 global growth to be at 2.9 percent, compared to 6.2 percent the year prior. Morgan Stanley predicted that this year's global economic growth will be less than half of 2021 and is driven by flowing factors: -

- repercussions from the Russian invasion of Ukraine the Ukraine-Russia war
- a Covid surge in China- China's tighter Covid curbs has halted factory production and plunged domestic demand, adversely affecting its export growth and consumption demand internally
- persistent supply chain frictions
- Commodity and oil prices spiked after Russia was hit with Western sanctions over its invasion of Ukraine, worsening inflation globally
- tightening monetary policy with many central banks across the world working to control record-high inflation.

➢ **<u>Institute of International Finance (IIF) cuts 2022 global GDP growth estimate in half</u>**

The Institute of International Finance slashed its 2022 growth outlook for global output in half, citing the economic effects of Russia's invasion of Ukraine, China's response to a COVID-19 wave and tighter monetary policy in the United States.

- IIF cut its forecast for global GDP growth to 2.3% from 4.6%,
- IIF expects the G3 - the United States, the euro area and Japan - growing at a 1.9% rate this year.
- They expect China's growth to decelerate to 3.5% from 5.1% in the previous estimate.

- Growth in Latin America is forecast slightly faster at 2% on the back of high commodity prices, while the IIF expects a certain degree of resilience from Middle East and North African oil exporters.
- The IIF expects capital flows to emerging markets to shrink by 42% from last year.
- Export bans of agricultural goods in Russia and India, as well as the expected interruption to the sowing and harvesting in Ukraine, were cited as the main reasons by IIF for downward trend in GDP growth. Further IIF cautioned a wide risk of global food insecurity, with the Middle East and Africa likely to be hardest hit.

U.S. Federal Reserve raises interest rates by half percentage to tame rising inflation

The Federal Open Market Committee of the Federal Reserve increased its interest rate by half a percentage point on May 4th, 2022, making the target range for the federal funds rate 0.75% to 1%. The inflation rate stands at 8.5%, the highest rate in 40 years, while supply and demand imbalances remain due to pandemic-related supply chain disturbances. The hike in interest rates is attributed to the following:

- the energy prices remain high as the Russian invasion of Ukraine disrupts the global energy supply, and
- coronavirus-related lockdowns in China are likely to impact supply chains.
- These events are creating upward pressure on inflation.

Target Federal Funds Rates for 2022

Date	Fed Funds Rate	Event
Jan. 26	0.25%	Effectively Zero
March 16	0.5%	Inflation trumped concerns over the Russian invasion of Ukraine
May 4	1%	Russian invasion of Ukraine continues as China brings back COVID-19 lockdowns

The committee is determined to bring the inflation rate down to its goal of 2% over the long run. To achieve this, the committee decided to raise the federal funds rate to its target rate of 1%.

The hike in Fed rates lead to higher cost of borrowing as loan and financing rates increase. Loans for cars and houses are affected by a consumer's credit history, meaning the latest hike can greatly impact buyers' loan rates. Loans on homes are reflected in the yield on 10-year Treasury bonds. The yield is highly influenced by market participant expectations of the state of the economy, which is largely affected by the decisions of the Fed. Therefore, these increases will drastically impact those in lower-income brackets. The increase in rates is intended to slow down the demand for goods and services and achieve a lower inflation rate.

Source- U.S. Federal Reserve

Fed also commented that additional 50 basis point increases could be seen at the next couple of meetings of Fed.

<u>World Economic Form Annual Meeting at Davos, cites lower FY 2023 global economic forecast</u>

The Global Economic Outlook session at Davos 2022 brought together leaders to discuss the key issues facing the global economy, including the prospect of recession.

The WEF pointed to five forces that will shape the global economic outlook this year. It said that the war in Ukraine, monetary tightening and financial market volatility, fiscal withdrawal, China's economic slowdown, and pandemic vaccine access had disrupted the recovery.

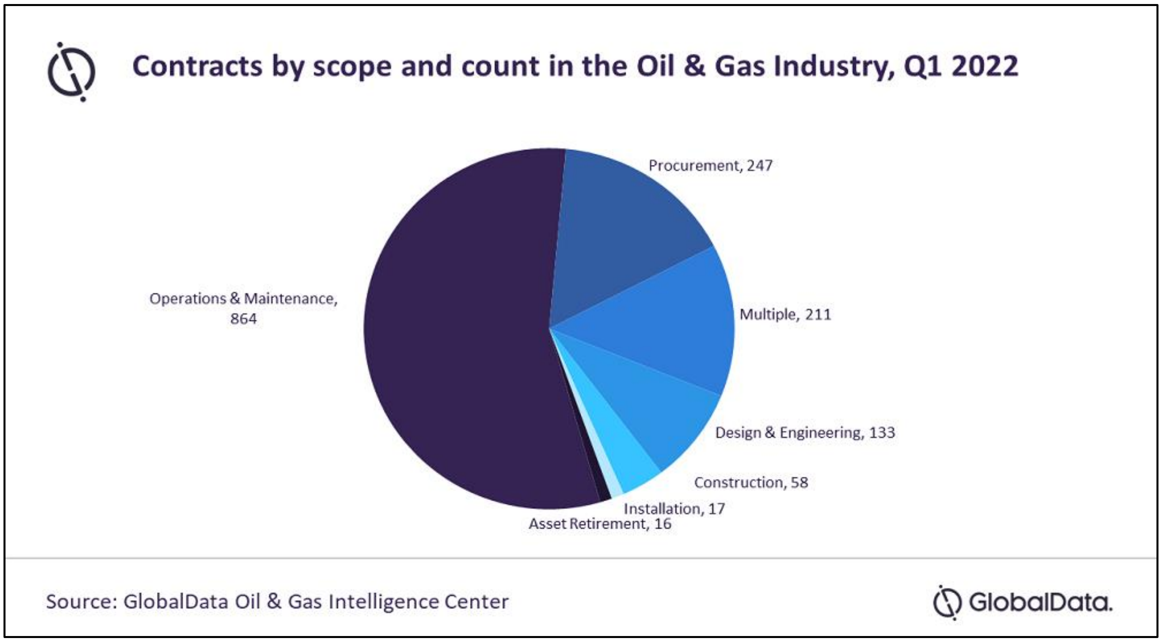
The WEF Davos annual meeting concurred with the latest International Monetary Fund (IMF) forecast from April, which sees global growth dropping to 3.6 percent in 2022, from its January 2022 forecast of 4.4 percent.

The WEF said economies in sub-Saharan Africa would be significantly affected by higher food prices, and is expected to grow on average by 3.8 percent.

<u>Global oil and gas contracts stifled in Q1 2022 as a result of rising inflation and the Russia-Ukraine conflict</u>

At the start of Q1 2022, global oil and gas industry contract activity was stifled due to the Russia-Ukraine conflict. However, in the second half of the quarter a minor increase in the number of contracts was reported. Unfortunately, the industry was unable to maintain its position in terms of contract value compared to the previous quarter, according to Global Data, a leading data and analytics company.

Contracts in the oil and gas industry could only float due to the uncertainties surrounding it, including the ongoing Russia-Ukraine crisis, rising prices, and project cost escalation. However, Saudi Aramco was able to keep the momentum going with Zuluf oil field expansion contracts during the quarter.



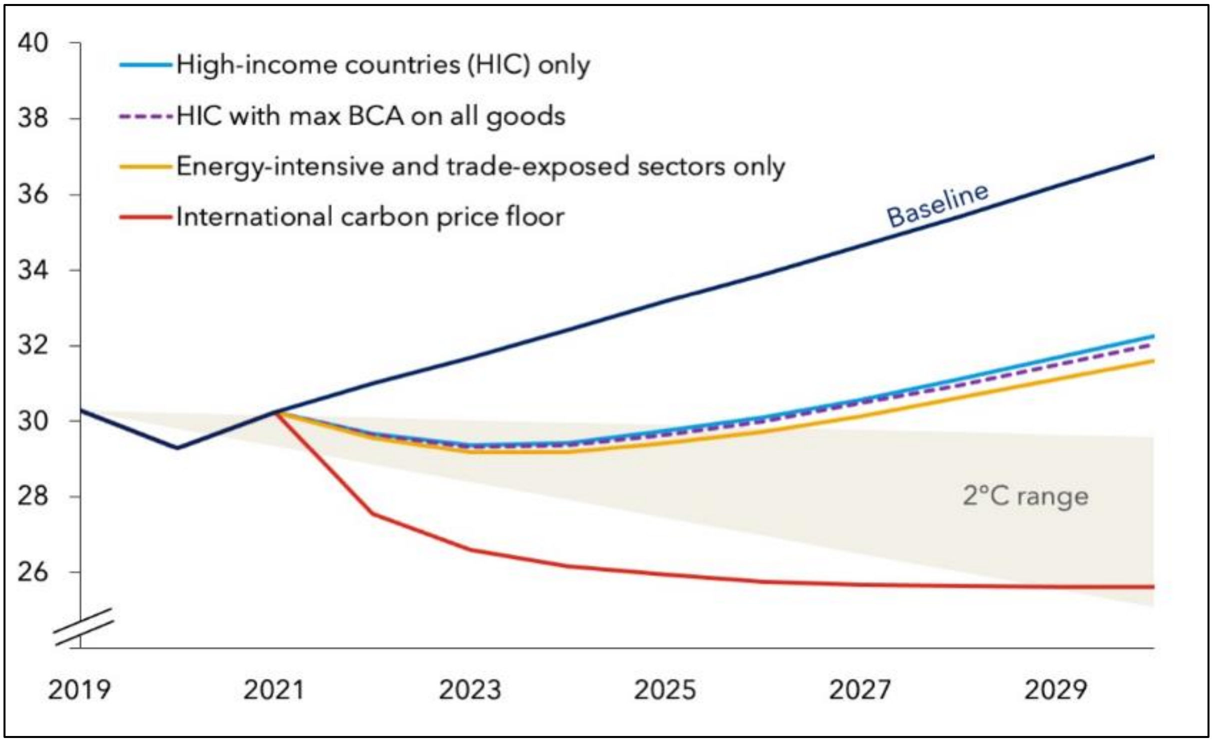
A notable contract during the quarter was Saudi Aramco's award of multiple contracts for the expansion of the Zuluf oil field in Saudi Arabia, including EPC work to JGC Holdings ranging between $2 and $2.5 billion for two sets of oil and gas separation units, gas compression units, and onshore processing facilities such as crude oil processing units, as well as EPC for injection water pumps, water-oil separation units, etc.

Countries Must Cooperate on Carbon Prices- IMF

The global spike in energy prices since Russia's invasion of Ukraine realises the importance and need to transition away from dependence on energy sources that are subject to recurrent disruptions. The war has impacted food security, which is already under pressure from crop failures and extreme weather events due to higher temperatures.

These developments make clear the importance of accelerating a green transition that would limit further temperature rises, while protecting vulnerable groups who are most dependent on high-carbon fuels and jobs.

Carbon pricing is considered the most effective policy tools to direct spending and investment to switch into green alternatives. One way of carbon pricing is through international carbon price floor (ICPF) agreement. This was proposed by IMF staff that called for the world's largest emitters to pay a floor price of $25-$75 per ton of carbon depending on their level of economic development. The proposal recognizes that some countries may use alternative policies to carbon pricing that should help to achieve the same emissions reductions as the carbon price floor.



First, it would reduce emissions sufficiently to accomplish the 2-degree target.

Second, it would have a small impact on global economic growth as the ICPF would reduce global gross domestic product by 1.5 percent by 2030. This is a price worth paying to prevent the far larger costs of failing to curb carbon emissions.

Third, it would ensure that the costs of transition are allocated according to differentiated responsibilities between countries of different income levels through differentiated carbon price floors. The ICPF proposal sets price floors per ton of carbon at $25 for low-income countries, $50 for middle-income countries, and $75 for high-income countries. This would be fairer than a uniform global carbon price across the world.

Digital co-operation will unlock economic growth- World Trade Organization

The World Trade Organisation estimates that global trade growth in the decade leading to 2030 will be 2 % points per annum higher as a result of the adoption of digital technologies. The US Commerce Department reports that e-commerce as a percentage of retail sales jumped to 20% in 2021 from just over 13% in 2019. In 2020, the WTO noted that these pandemic-induced changes in behaviour may result in a fundamental and long-term shift in services trade.

As digitalisation accelerates, governments are grappling with how best to manage the digital transformation while safeguarding the broader public interest. From a public policy perspective, encouraging innovation while protecting consumers will be important for ensuring inclusive economic growth and advancing the digital economy. However, studies show that digital barriers could reduce gross domestic product growth by restricting trade output and slowing productivity.

The latest publication from the Visa Economic Empowerment Institute tackles some of these issues. The paper highlights the growing complexity of digital regulations and calls for greater co-operation on digital issues. According to the VEEI, one solution is to focus on negotiating high-standard digital trade agreements. As an example, the Singapore-Australia digital economy agreement addresses barriers to digital growth by removing market access restrictions and encouraging greater regulatory co-operation between the markets.

Further, the adoption of industry-driven global standards can also help. Such standards can drive a level of harmony that eases adoption, thereby lowering barriers to entry, reducing costs and improving security.

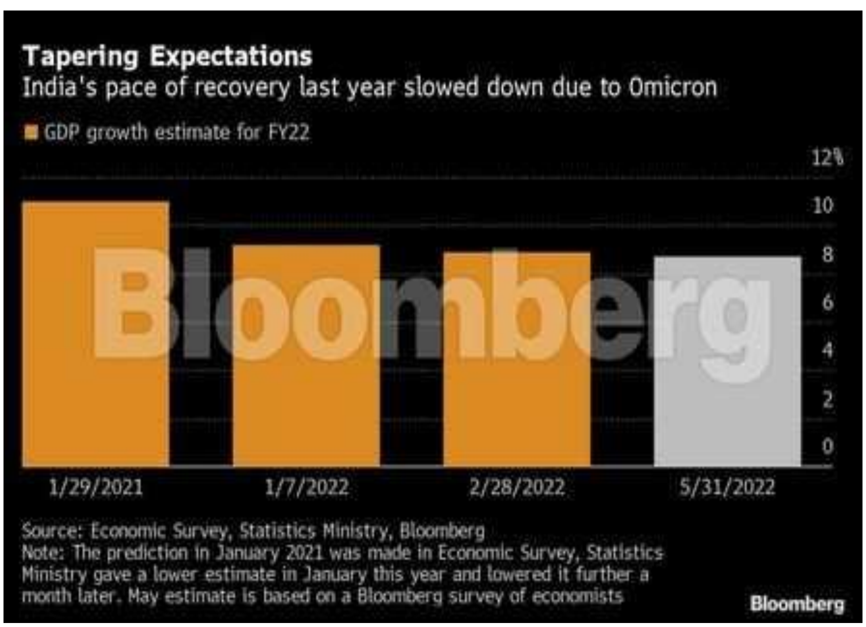
Additionally, continued engagement and co-operation across international and non-governmental organisations, like the G7, Organisation for Economic Co-operation and Development or the Asia-Pacific Economic Co-operation, can help push the conversation forward.

Taken together, trade agreements, standards, policy forums and discussions can help unwind the regulatory complexity that clouds digital issues.

India

India's GDP growth

According to the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, India's economy grew by 4.1 per cent in the fourth quarter of 2021-22, pushing up the annual growth rate to 8.7 per cent. The nominal GDP grew by 19.5% in the financial year 2021-22. The numbers have come down from the official second advance estimate of 8.9% released in February owing to third-wave of Covid-19 and surging global prices.



Other key economic indicators released by NSO are as below: -

- The growth in the January-March period was 4.1 % which was slower than the 5.4 per cent expansion in the previous October-December quarter of 2021-22.
- The slowdown in the fourth quarter stemmed from the adverse impact of the third wave on contact services and private consumption, of high commodity prices, and shortage of raw materials and supply-side disruptions adversely affecting agriculture and industry sectors.
- The gross domestic product (GDP) had expanded by 2.5 per cent in comparison to the corresponding January-March period of 2020-21, according to data released by the National Statistical Office (NSO).
- Fiscal deficit for 2021-22 worked out to be 6.71 per cent of the gross domestic product (GDP), lower than 6.9 per cent projected by the Finance Ministry in the revised Budget Estimates.
- While manufacturing shrinks 0.2% vs 0.3% expansion in previous quarter; Contact-intensive sectors like trade, hotels, and transport grew by 11.1% compared to a contraction of 20% in the previous year.
- Agriculture slowed to 3% in FY22 compared to a growth of 3.3% in last fiscal.

For FY 2023, RBI had revised the GDP growth rate to 7.2%, from 7.8%, in its April resolution due to higher oil prices causing a threat to private consumption.

The following factors determine India's GDP growth in FY 2023: -

- Domestic economic activity stabilized in March-April with the ending of third wave of COVID-19 and the easing of restrictions.
- Urban demand appears to have maintained expansion.
- Investment activity have been on a rise with improving capacity utilization, stronger corporate balance sheets and better financial conditions.
- Merchandise exports recorded double digit expansion for the fourteenth consecutive month in April. Non-oil non-gold imports also grew robustly on the back of improving domestic demand.
- The worsening external environment, elevated commodity prices and persistent supply bottlenecks pose rising inflation risks in India. Accordingly, the Monetary Policy Committee has decided to increase the policy repo rate by 40 basis points to 4.40 per cent.

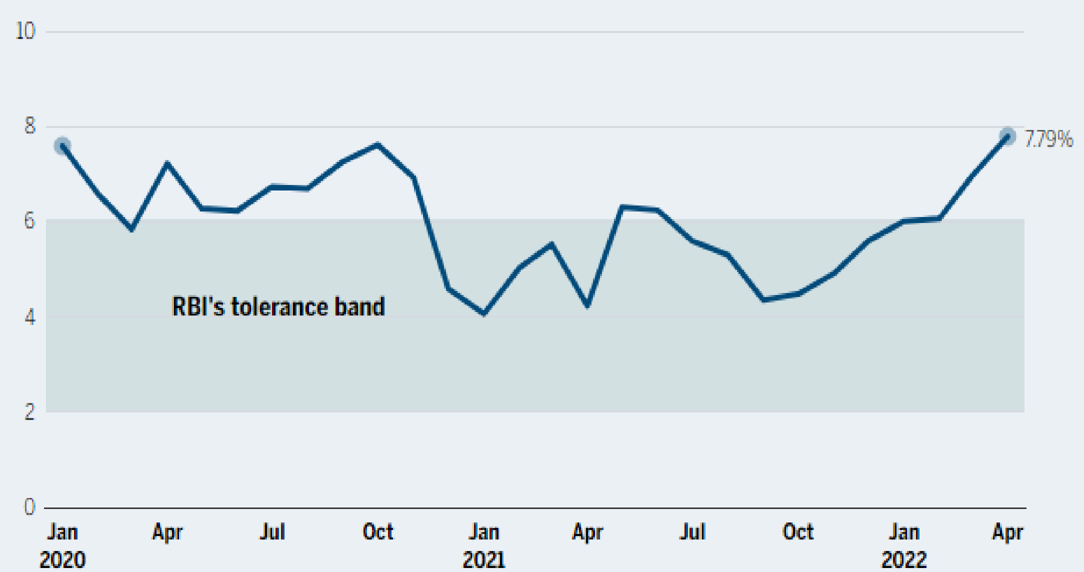
Inflation in India

- According to the data released by the National Statistics Office (NSO), inflation in April was a record-breaking 7.7 per cent, which is almost double the rate that the RBI must maintain, for smooth functioning of the economy.

- The Wholesale Price-based Index (WPI) also saw an increase from 14.5 per cent in March to 15 per cent in April.

- The food price inflation (combined for rural and urban) surged to a 17-month high of 8.38 per cent in April from 7.68 per cent in March. While the Fuel and Light category saw a rate of 10.8 per cent of inflation.

Retail inflation has remained above RBI's tolerance band for 4 straight months

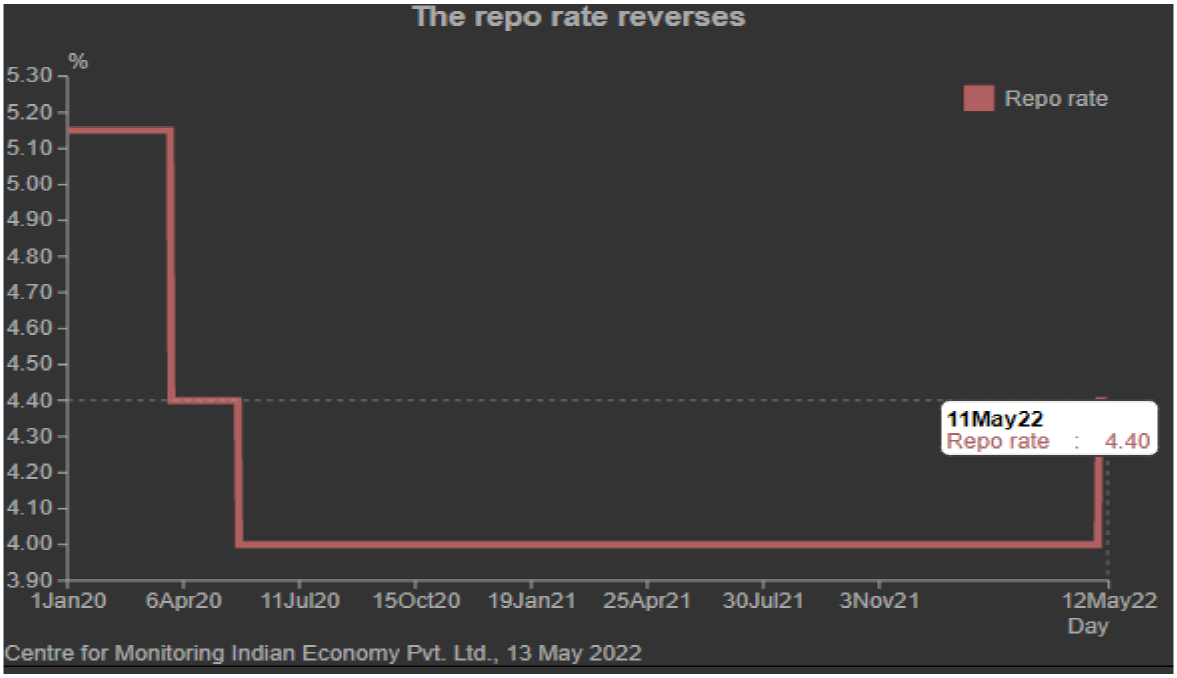


TOI Based on Wholesale Price Index (WPI) and Consumer Price Index (CPI); the Reserve Bank's tolerance band is a range the central bank is tasked to keep inflation within 2-6% • Source: Ministry of Statistics, India

- According to RBI, the cost-push pressures from high industrial raw material prices, transportation costs and global logistics and supply chain bottlenecks have an adverse impact on core inflation.

RBI stance on inflation

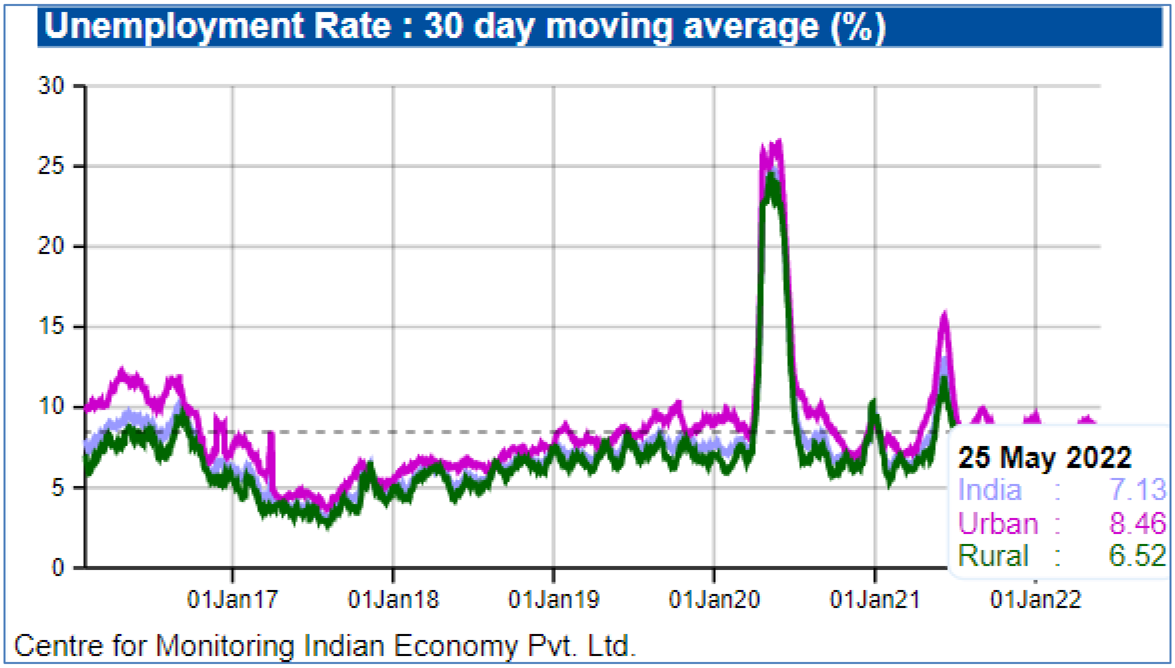
- The Reserve Bank has continued with liquidity withdrawal in a phased manner in sync with monetary policy and macroeconomic developments.



- A 50 bps increase in the cash reserve ratio to 4.5% and a 40 bps increase in policy repo rate to 4.40 % signals RBI's intent on withdrawal of accommodation to ensure that inflation remains within the target, while supporting growth.
- This move ensures RBI's stance to remain accommodative while focusing on withdrawal of accommodation to ensure that inflation remains within the target going forward while supporting growth.
- The core mandate of the central bank is to manage retail inflation and ensure that it remains within the range of the 2-6%.

India's employment

The CMIE data for May suggest that the quantum of employment continues to remain a challenge, with pressure on the labour market as the unemployment rate rose to 7.13% in the month of May 2022 with urban unemployment rate at 8.46% and the rural unemployment rate is 6.52% in May 2022.

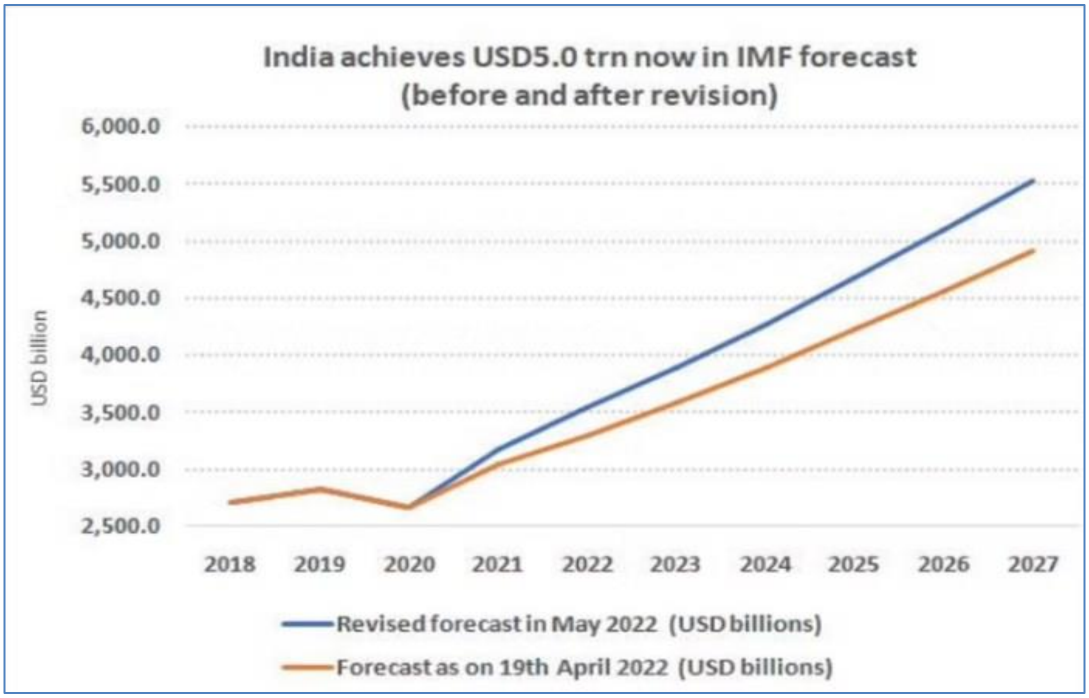


India's external sector

According to Reserve Bank of India (RBI) data, India's forex reserves declined by $2.67 billion to $593.28 billion for the second week of May, 2022. Of the $593.28 billion foreign exchange reserves held by India, $529.55 billion is in foreign currency assets, $40.57 billion is in gold, $18.20 billion in special drawing rights, which is an international reserve asset created by the International Monetary Fund (IMF), and $4.95 billion in reserve position in the IMF. While the foreign currency assets fell by 1.3 billion, the gold reserves dropped by 1.17 billion.

IMF, which predicted India cannot become a $5 trillion economy before 2028-2029, changes its forecast

The International Monetary Fund (IMF), which predicted in April this year that India cannot become a $5 trillion economy until 2028-2029, has reworked its forecast in the World Economic Outlook database. As per the latest revision by IMF, India will reach its $5 trillion economy target by 2026-2027 i.e., two years earlier than they initially predicted. The new forecast also claims that India will become a $5.5 trillion economy in 2027-2028.



The change in forecast is due to the assumption that the rupee will depreciate to ₹84 against the US dollar and not ₹94.

International agencies lower India's GDP growth rate for FY 2023.

- **Morgan Stanley cuts India's GDP growth forecasts on inflation, global slowdown**

According to Morgan Stanley, India's economic growth in the next two fiscal years is expected to be lower due to a global slowdown, surging oil prices and weak domestic demand. According to Morgan Stanley. Gross domestic product growth is expected to be 7.6% for fiscal 2023 (from earlier projection of 7.9%) and 6.7% (from earlier projection of 7%) for fiscal 2024. The reasons attributed to this downward trend are as follows: -

- Adverse terms of trade shock, surging oil prices and impact on business confidence from geopolitical tensions
- The pronounced economic impact from the Russia-Ukraine conflict that has driven up crude prices, pushing retail inflation in India - to its highest-level mark in 17 months.
- Further, weaker consumer demand, tighter financial conditions, and adverse impact on business sentiment also weigh down India's economic growth.

Further, Morgan Stanley estimated that both inflation and current account deficit is likely to get worse due to broad-based price pressures and record-high commodity prices. The country has also been importing oil from sanctions-hit Russia at discounted rates to ease some of the pressure from surging crude prices, which recently touched $139 a barrel.

India meets nearly 80% of its oil needs through imports and rising crude prices push up the country's trade and current account deficit while also hurting the rupee and fuelling imported inflation.

In a move to contain rising inflation pressures,

- RBI has raised its main repo rates in May to 4.4 %.
- Further, Morgan Stanley expects hikes of 50 bps each in month of June and August to further tame the inflation.

- **Moody's slashes India's 2023 GDP growth forecast by 30 bps to 8.8 per cent**

Moody's Investors slashed India's economic growth projection to 8.8 per cent for 2022 from 9.1 per cent earlier, citing high inflation. GDP growth forecast for 2023 has been retained at 5.4 per cent. In Global Macro Outlook 2022-23, Moody's said that the growth momentum from December quarter 2021 carried through into the first four months this year. The factors weighing down the GDP growth rate, according to Moody's are: -

- Spike in global crude oil, food, fertilizer prices
- Slowdown in demand recovery

However, Moody said that strong credit growth, a large increase in investment intentions announced by the corporate sector, and a high budget allocation to capital spending by the government indicate that the investment cycle is strengthening.

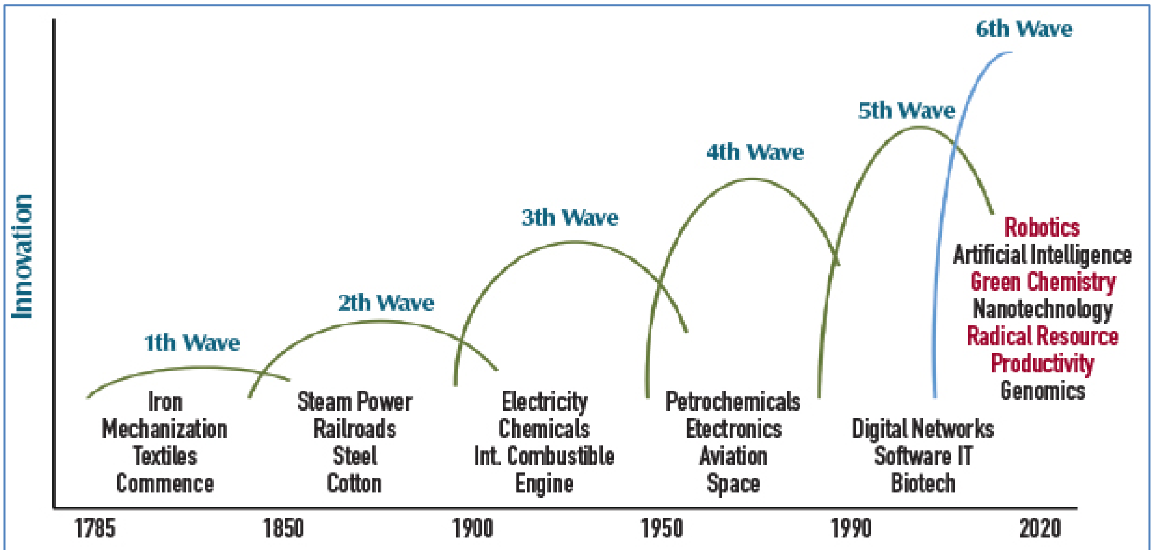
LESSONS FROM ECONOMICS

The Luddite Fallacy

The fear that technological unemployment may happen in the context of technical change is explained by 'Luddite Fallacy'. Luddites were a group of English textile workers who lived during first industrial revolution period. They feared that machines will destroy their jobs and livelihoods with the growth of the textile industry. The new machines were more productive, and some workers lost their relatively highly paid jobs.

Similarly, the 1990s witnessed bank tellers lose their jobs to ATMs. During different periods of history, factory workers, farmworkers, and craftsmen, feared that technology was going to automate all the jobs. The Luddite fallacy has persisted as a fallacy because for the last two centuries technological innovation, mechanization and automation has grown at an unprecedented rate in human history.

WAVES OF INNOVATION



Sources: The Natural Edge Project, Bain Consulting, Michael Porter (Harvard Business School)

The underlying argument behind the Fallacy is the argument of economists that new technology will not increase the long-term unemployment rate (though there may be temporary unemployment- structural unemployment). Several propositions made by renowned economists is presented below: -

- Economists, Keynes in the 1930s coined the term "technological unemployment" to denote job losses caused due to automation and argued that the short phase of unemployment was merely a "temporary phase of adjustment" before the jobs circle back into the economy.

- Economists like Jacob Mincer and Stephan Danninger, have relied on the "compensation theory" to justify the minimal to none negative effects of technological innovation on employment in the long-term. They explained their theory as below: -
    - automation leads to an increase in productivity since machinery produces goods at a lower price and at a faster pace.
    - Since a product's demand generally tends to rise only little over the short term, workers are laid off as machines take up their share of work.
    - Decreased product prices, allow consumers to spend their surplus money in different markets, creating newer demands elsewhere.
    - Similarly, the costs saved by business owners by laying off workers allows them to reinvest money into new ventures, creating its own new demand for labor.
    - This in the long run compensates for the temporary loss in jobs since laborer's tend to get re-employed to meet these newly created demands.

- Classical economists argued that construction, maintenance, and development of machines required to do the automated work creates its own demand for labor.

Therefore, technology has enabled the economy to move towards a more service sector-based economy. Lower costs of manufactured goods have enabled people to be able to afford a wider range of goods and services.

Further, it is argued that people who lost their job because of technological change found themselves unemployed because of:

- occupational immobility (lack of skills to work in the service sector)
- geographical immobility (difficulties of moving to areas where new jobs are created)

In the long-term, the unemployed should be able to take new jobs which are created. Therefore, if workers are threatened with job losses as a result of new technology, the solution is to overcome market failure in removing labor market inflexibilities. Education and re-training should be provided to help the unemployed find new jobs. Workers need to upgrade their skills and should be trained to perform high-specialized demand cognitive power jobs.

Introduction of Artificial Intelligence (AI) and Luddite Fallacy

It encompasses a myriad of new and improved technologies; artificial intelligence (AI), machine learning, big data, data analytics, the development of new materials, the Internet of things (IoT), self-driving cars, genetic editing, 3-D printing, greater interconnectedness, drone technology, and many others. The rapid pace of the technological changes associated with emerging technologies may cause many jobs to become redundant and workers to become obsolete.

However, it is argued that any technological change leads to higher economic welfare with mass of the population may see a small rise in living standards. At the same time, there is a strong case for a government providing unemployment insurance relief and free training to the unemployed.

Oil Market

Crude oil price – Monthly Review

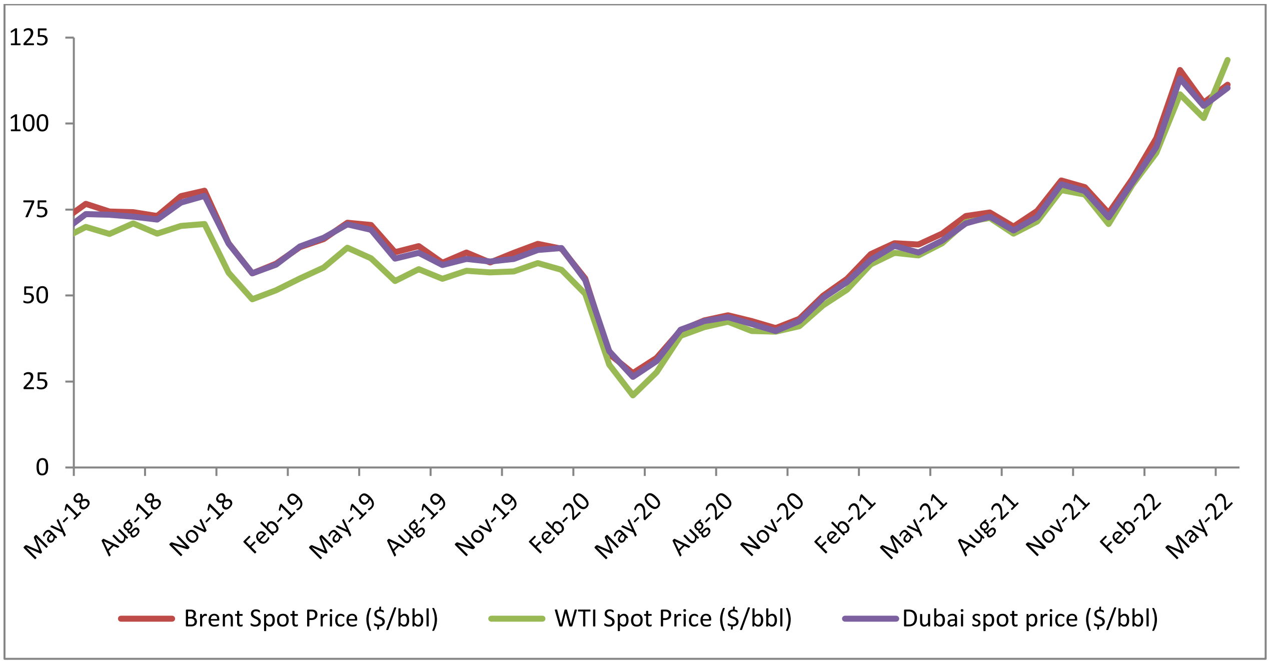
Global Oil prices remain in a volatile state over the past month. The oil prices gain significantly hovering above $100 per bbl as the effect of uncertainty over sanctions on Russia by the European Union have offset the demand fears as China continued with its strict lockdowns led by a spike in COVID-19 cases. The major developments taken place are as under: -

- In the first week of May 2022, the supply disruptions adversely impact the global price movement.
  - The voluntary sanctions on Russian crude oil by several countries globally have resulted in tightening of the oil market. As a result, the OPEC have lowered expected supplies coming from Russia by 0.36 million barrels per day to 10.88 million barrels per day in 2022.
  - OPEC reported a marginal increase in production during the month with higher output from Iraq and Saudi Arabia which was partially offset by a steep decline in output in Libya.
  - As a result of above, the Brent crude prices rose and was trading at $113.05/bbl and US crude at $ 110.43/ bbl on 7th May, 2022.

- However, in second week of May 2022, energy prices cool down and Brent and WTI prices retreated due to following factors: -
  - The fresh Covid-19 cases forced China to impose a large-scale lockdown which impacted China's refineries as well as the country's demand for oil.
  - Further, the news on slack in global economic growth from an estimated 6.1 % in 2021 to 3.6 % in 2022 by IMF has reduced the expected demand for crude oil.
  - The Russia/Ukraine conflict-affected economic growth in the EU region resulting in a downward revision in the region's expected GDP growth to 2.8 % in 2022, by the IMF, as compared to 5.3 % growth seen in 2021.
  - As a result of the decline in economic activity in US and EU region, the demand for crude oil has fallen resulting in decline in prices.
  - The WTI and Brent crude oil prices plunged to 99$/bbl and $ 101.7 /bbl respectively on 11th May, 2022.

- Despite the fall in crude prices in mid of May, the prices rose towards third and fourth week of May, 2022 on hopes of demand recovery in China as the country eases some of its Covid 19 containment measures. Further, oil prices rose due to tightening of crude supplies with data from the U.S. government on stockpiles expected U.S. crude oil and gasoline inventories to fall. As a result, the WTI and Brent crude oil prices rose to 118.5 $/bbl and 122.72 $/bbl respectively on 31st May, 2022.

Figure 1: Benchmark price of Brent, WTI and Dubai crude



Source: WORLD BANK

- Brent crude price averaged $ 111.28 per bbl in May 2022, up by 4.9% on a month on month (MoM) and 63.6 % on year on year (YoY) basis, respectively.
- WTI crude price averaged $ 118.50 per bbl in May 2022, up by 16.6 % on a month on month (MoM) and 81.7 % on year on year (YoY) basis, respectively.
- Dubai crude price averaged $ 110.42 per bbl in May 2022, up by 5.0 % on a month on month (MoM) and 67.3 % on year on year (YoY) basis, respectively.

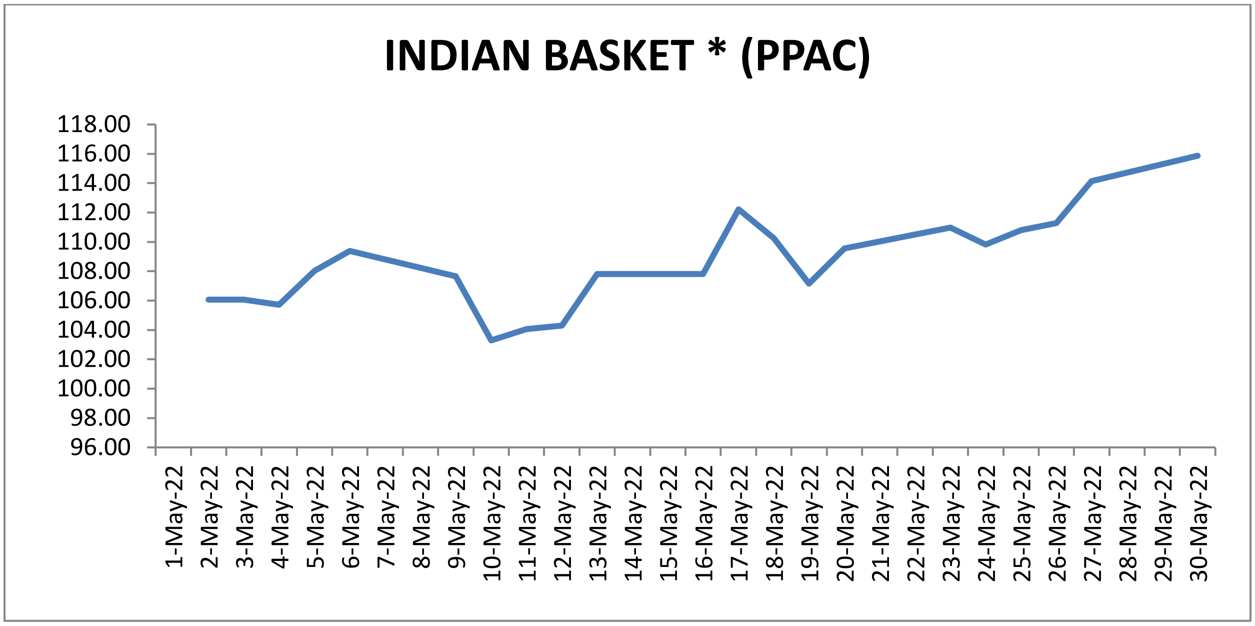
Table 1: Crude oil price in May, 2022

Crude oil	Price ($/bbl)	MoM (%) change	YoY (%) change
Brent	111.28	4.9%	63.6%
WTI	118.50	16.6%	81.7%
Dubai	110.42	5.0%	67.3%

Source: WORLD BANK

Indian Basket Crude oil price

Figure 2: Indian crude oil basket price in $ per bbl



Source: Petroleum Planning & Analysis Cell

- Indian crude basket price averaged $ 108.68 per barrel in May 2022, up by 5.9 % on Month on Month (M-o-M) and by 62.5 % on a year on year (Y-o-Y) basis, respectively.

Oil production situation

- Non-OPEC liquids supply growth y-o-y in 2021 is broadly unchanged at around 0.6 mb/d. Total US liquids production is estimated to have increased y-o-y by 0.15 mb/d. The largest increases for the year were seen in Canada, which rose by 0.3 mb/d, followed by Russia and China, which are estimated to each have grown by 0.2 mb/d.

- Non-OPEC supply growth for 2022 is revised down by 0.3 mb/d y-o-y to 2.4 mb/d. Russia's liquids production for 2022 is revised down by 0.36 mb/d. The US liquids supply growth forecast for 2022 is broadly unchanged at 1.29 mb/d. The main drivers of liquids supply growth for the year are expected to be the US, Canada, Brazil, Kazakhstan, Guyana and Norway.

Oil demand situation

- In 2022, oil demand growth was revised down by 0.3 mb/d to average 3.4 mb/d y-o-y, accounting for potential declines in global GDP and the resurgence of the Omicron variant of COVID-19 in China and its impact on global oil demand. World oil demand is projected to average 100.3 mb/d, which is 0.2 mb/d lower than the previous month's estimates and approximately 0.1 mb/d higher than 2019

Table 2: World Oil demand in mbpd	2021	1Q2022	2Q2022	3Q2022	4Q2022	2022	Growth	%
Total OECD	**44.76**	**45.71**	**45.36**	**47.21**	**46.47.79**	**46.53**	**1.76**	**3.94**
~ of which US	*19.93*	*20.10*	*20.67*	*21.17*	*21.18*	*20.78*	*1.04*	*4.30*
Total Non-OECD	**52.16**	**53.57**	**53.08**	**53.53**	**54.85**	**53.76**	**1.60**	**3.07**
~ of which India#	*4.77*	*5.18*	*4.82*	*4.97*	*5.35*	*5.08*	*0.31*	*6.43*
~ of which China	14.84	14.57	15.26	15.28	15.83	15.24	0.40	2.70
Total world	**96.92**	**99.28**	**98.44**	**100.74**	**102.64**	**100.29**	**3.36**	**3.47**

Source: OPEC monthly report, May 2022

 # During 2022 rising oil demand will be supported by increasing requirements in all main petroleum product categories, however, some downside risks pertain relating to rising COVID-19 cases, new variants and their associated containment measures, as well as fuel substitution.

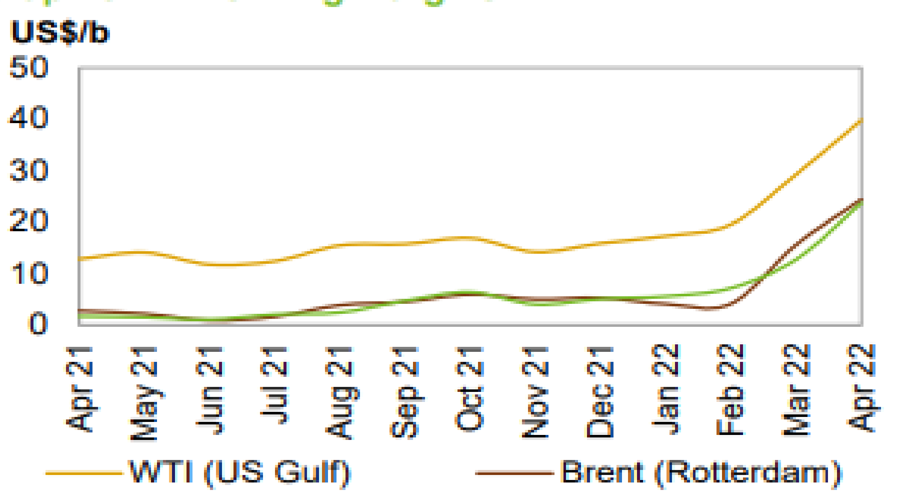
*Note: *2021=Estimation and 2022 = Forecast. Totals may not add up due to independent rounding*

Global petroleum product prices

US Gulf Coast (USGC) refining margins against WTI soared, posting sizeable gains for the fifth consecutive month. Positive market performances were observed in all main products across the barrel, particularly in the middle section, with the exception of naphtha. In the USGC, gasoline represented the main margin driver, in line with strong improvement in domestic mobility indicators.

Refinery margins in Rotterdam against Brent rose sharply, as robust performances at the middle of the barrel boosted margins to a new multi-year high. Concerns over purchases of Russian crude and product supplies triggered further concerns of a product shortage in the region, particularly that of diesel, as European refiners continue to seek alternative sources of products previously supplied by Russia.

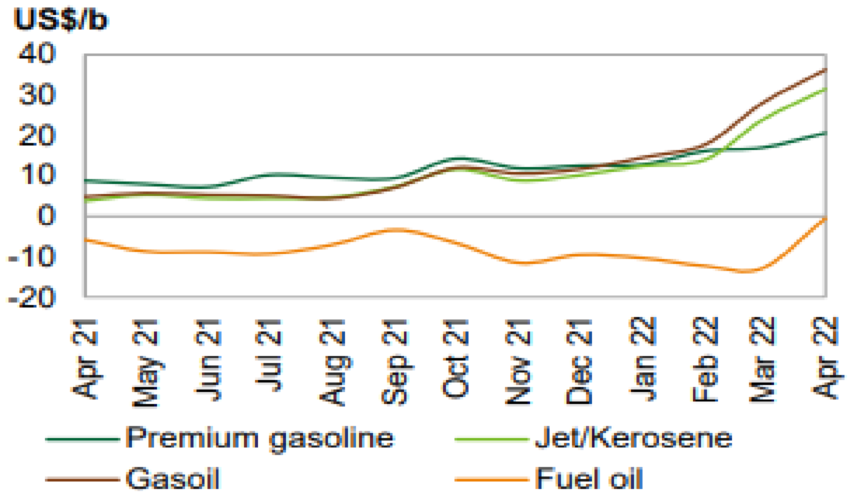
Graph 6 - 1: Refining margins



Sources: Argus and OPEC.

The Asian gasoline 92 crack spread gained momentum and showed significant improvement compared to the relatively flat performance seen in the previous month. Stronger regional mobility indicators – particularly in South Korea, Indonesia and India – provided support. However, the negative impact of the most recent COVID-19 outbreak and the strict lockdown and mobility restrictions, particularly in China, limited gains in Asian gasoline margins compared with the other products as gasoline was most affected.

Graph 6 - 5: Singapore crack spreads vs. Dubai



Sources: Argus and OPEC.

The Singapore gasoil crack spread soared to a new record high, backed by strong regional demand, particularly from India as well as stronger delivery requirements due to low gasoil inventories in East of Suez. Firm industrial, agricultural and manufacturing activity in the region remained supportive. Moreover, the heavy refinery maintenance works, as well as unplanned outages amid refinery run cuts in China due to COVID-19 restrictions, all led to a deeper contraction in gasoil availability in the region.

Table 3: Singapore FOB, refined product prices ($/bbl)

Singapore product prices	Price ($/b) in April 2022	MoM (%) change	YoY (%) change
Naptha	97.75	-12.3%	56.7%
Premium gasoline (unleaded 95)	126.73	-3.3%	71.4%
Regular gasoline (unleaded 92)	123.45	-3.2%	72.2%
Jet/Kerosene	134.35	0.0%	101.3%
Gasoil/Diesel (50 ppm)	148.36	4.4%	115.9%
Fuel oil (180 cst 2.0% S)	137.21	0.7%	103.6%
Fuel oil (380 cst 3.5% S)	102.47	5.0%	79.5%

Source: OPEC

Petroleum products consumption in India

Monthly Review:

- Overall consumption of all petroleum products in April 2022 with a volume of 18.7 MMT registered a growth of 9.45% on volume of 17.0 MMT in April 2021.
- MS (Petrol) consumption during the month of April 2022 with a volume of 2.8 MMT recorded a growth of 17.26% on volume of 2.4 MMT in April 2021.
- HSD (Diesel) consumption during the month of April 2022 with a volume of 7.2 MMT recorded a growth of to 7.8% on volume of 6.7 MMT in the month of April 2021.
- LPG consumption during the month of April 2022 with a volume of 2.2 MMT registered a growth of 2.39% over the volume of 2.1 MMT in the month of April 2021
- ATF consumption during April 2022 with a volume of 0.539 MMT registered a growth of 30.39% over the volume of 0.105 MMT in April 2021.
- Bitumen consumption during April 2022 with a volume of 0.76 MMT a growth 15.44% on a month-on-month basis over volume of 0.65 MMT in the month of April 2021.
- Kerosene consumption registered a de-growth of 31.35% during the month of April 2022 as compared to April 2021.

Table 4: Petroleum products consumption in India, April 2022

CONSUMPTION OF PETROLEUM PRODUCTS (P)	Consumption in '000 MT	MoM (%) change	YoY (%) change
LPG	2,164	-12.7%	2.4%
Naphtha	1,063	-4.4%	-16.5%
MS	2,798	-3.8%	17.3%
ATF	539	-0.7%	30.4%
SKO	72	-36.7%	-31.3%
HSD	7,204	-6.5%	7.8%
LDO	52	-37.0%	-46.3%
Lubricants & Greases	431	-8.5%	66.5%
FO & LSHS	525	-9.6%	-3.4%
Bitumen	760	-15.0%	15.4%
Petroleum coke	1,172	-12.2%	-27.8%
Others	1,862	57.3%	112.6%
TOTAL	**18,640**	**-4.0%**	**9.5%**

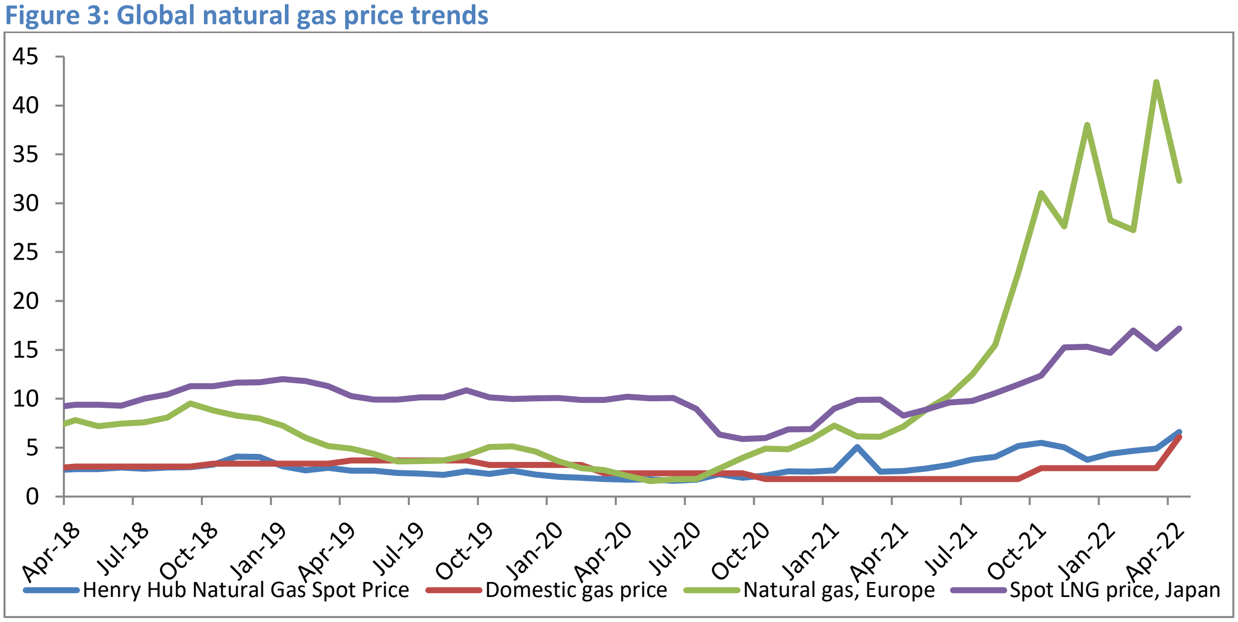
Source: PPAC

Natural Gas Market

Natural Gas Price – Monthly Review

- U.S. natural gas prices surged to the highest level in more than 13 years as Russia's war on Ukraine causes a global energy crunch. For the year, U.S. natural gas prices are now up 219.1% from a year ago, currently trading at 8.87 $/mmbtu (2.78 $/mmbtu a year ago), which is adding to inflationary concerns across the economy. The U.S. is also sending record amounts of liquefied natural gas to Europe, which is lifting Henry Hub prices.
- In Europe, Spot gas prices have soared to record highs as country moves away from dependence on Russian energy. The natural gas spot price at the Title Transfer Facility (TTF) in the Netherlands in Europe has been trading at all-time high levels. The TTF price averaged $32.20 per MMBtu
- Japan Liquefied Natural Gas Import Price is averaging at $ 17.18 per MMBtu for May 2022, up from 15.11 last month which is a change of 13.67% from last month. The rise in prices is a result of persistent cold weather conditions in Japan that results in increase in natural gas heating expenditures during winter.
- The price of domestically produced natural gas is $6.10 per million British thermal unit (MMBtu) from April1, 2022 to September 30, 2022. The price of domestic gas price has been hiked by 110 percent from the previous revision which was $2.90 per MMBtu for October 1, 2021, to March 31, 2022. The domestic gas price increase was driven by the significant run-up in the prices of gas at global gas hubs. Further, the maximum sale price allowed to natural gas production from deep-water, ultra-deep-water, high pressure and high-temperature discoveries was increased from $6.13 per MMBtu to $9.92 per MMBtu.

Figure 3: Global natural gas price trends



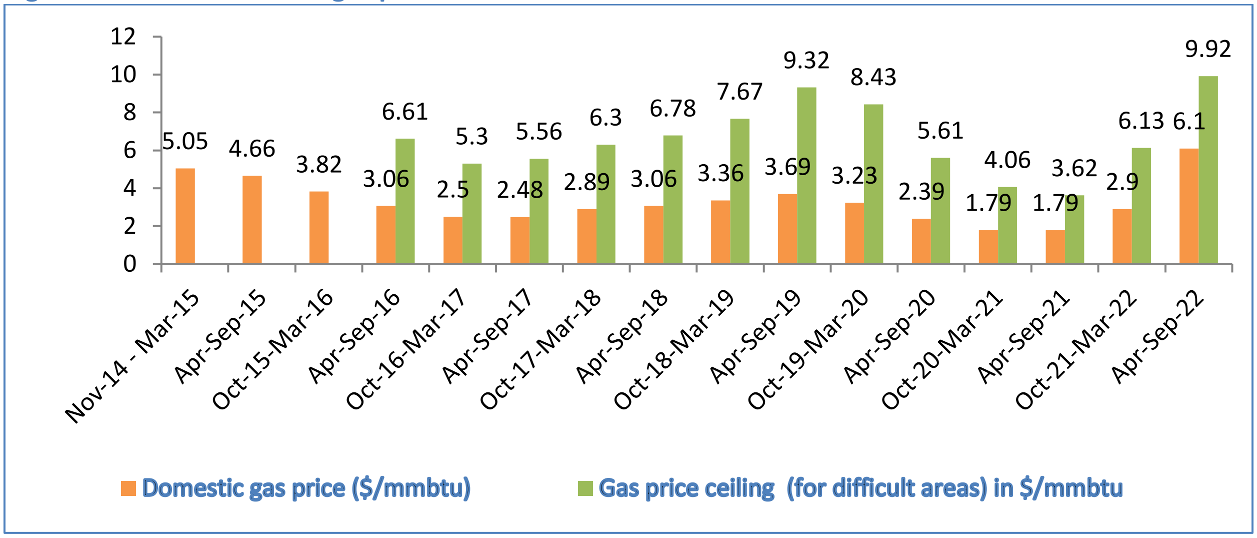
Source: EIA, WORLD BANK

Table 5: Gas price

Natural Gas	Price ($/MMBTU) in May 2022	MoM (%) change	YoY (%) change
India, Domestic gas price	6.10	-	240%
India, Gas price ceiling – difficult areas	9.92	-	174.03%
Henry Hub	8.87	34.7%	219.1%
Natural Gas, Europe	32.20	-23.8%	351.7%
Liquefied Natural Gas, Japan	17.18	13.67%	107.5%

Source: EIA, PPAC, World Bank

Figure 4: Domestic natural gas price



Source: PPAC

Indian Gas Market

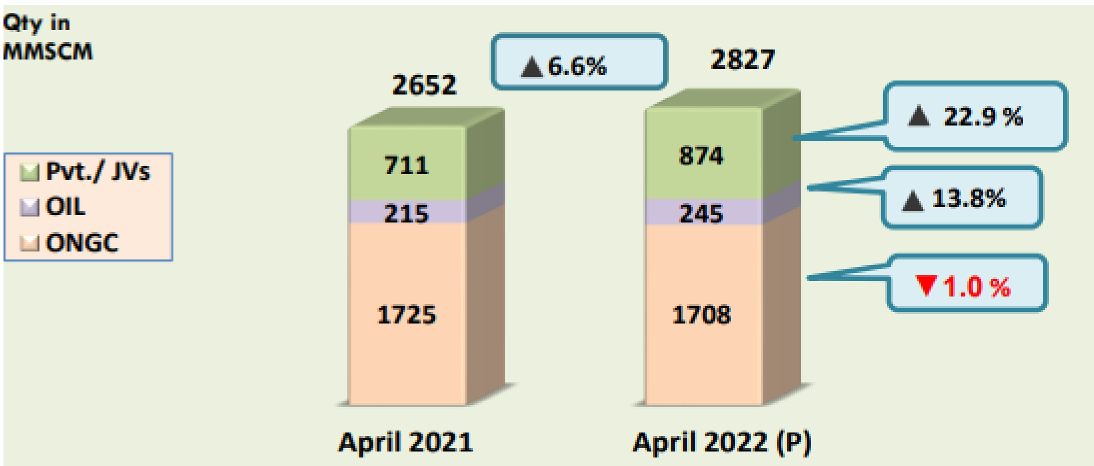
- Gross production of natural gas for the month of April, 2022 was 2827 MMSCM (increase of 6.6% over the corresponding month of the previous year).
- Total imports of LNG (provisional) during the month of April 2022 were 2442 MMSCM (decrease of 14.2% over the corresponding month of the previous year).
- Natural gas available for sale during April 2022 was 4712 MMSCM (decrease of 4.9% over the corresponding month of the previous year).
- Total consumption during April 2022 was 4493 MMSCM (provisional). Major consumers were fertilizer (34%), City Gas Distribution (CGD) (23%), power (12%), refinery (9%) and petrochemicals (2%).

Monthly Report on Natural gas production, imports and consumption – April 2022

1. Domestic Natural Gas Gross Production:

Domestic natural gas gross production for the month of April, 2022 was 2827 MMSCM (increase of 6.6 % over the corresponding month of the previous year).

Figure 10: Domestic natural gas Gross production (Qty in MMSCM)

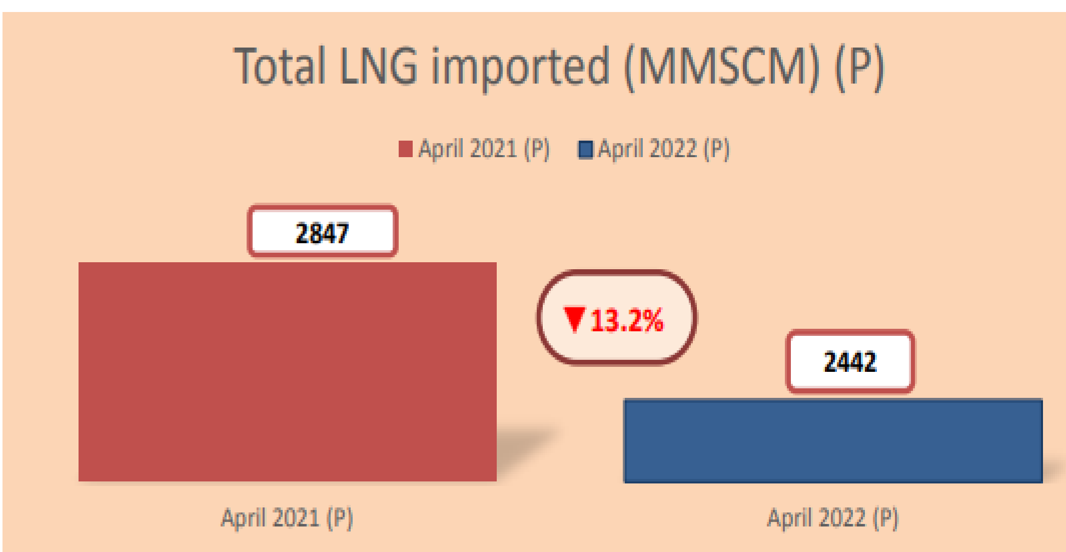


Source: PPAC

2. LNG imports:

Total imports of LNG (provisional) during the month of April 2022 were 2442 MMSCM (decrease of 13.2 % over the corresponding month of the previous year 2847 (MMSCM).

Figure 11: LNG imports (Qty in MMSCM)

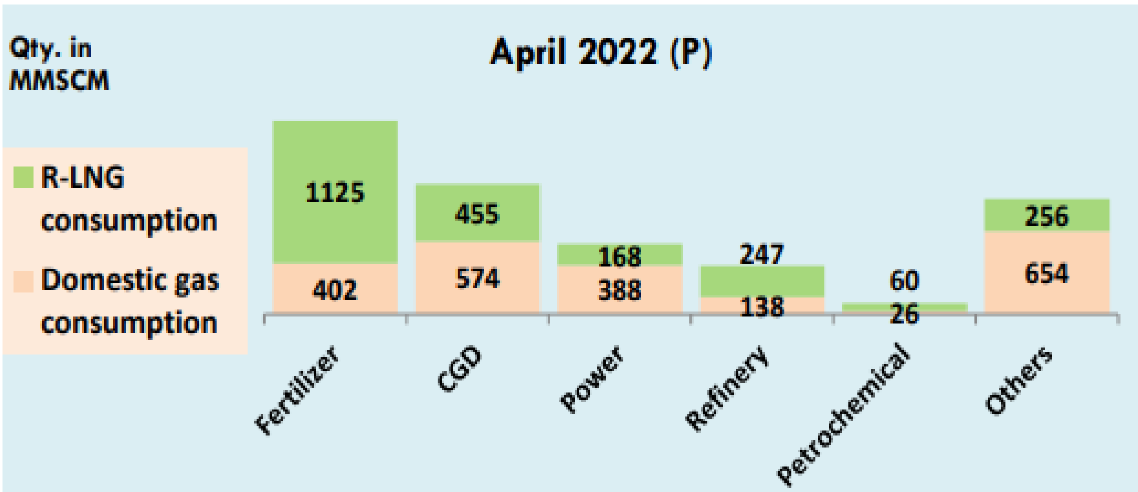


Source: PPAC

3. Sectoral Consumption of Natural Gas:

Total consumption of natural gas during April 2022 was 4493 MMSCM. Major consumers were fertilizer, CGD, power, refinery, others and petrochemicals.

Figure 12: Sectoral Consumption of Natural Gas (Qty in MMSCM) in February 2022



Source: PPAC

Key developments in Oil & Gas sector during April 2022

- **Monthly Production Report for April, 2022**

1. Production of Crude Oil

Indigenous crude oil and condensate production during April 2022 was lower by 0.9 % than that of April 2021 as compared to a de-growth of 3.4 % during March 2021. OIL registered a growth of 3.6 % and ONGC registered a growth of 0.9 % during April 2022 as compared to April 2021. PSC registered de-growth of 7.6 % during April 2022 as compared to the same period of the previous year.

2. Production of Natural Gas

Gross production of natural gas for the month of April 2022 was 2827 MMSCM which was higher by 6.6% compared with the corresponding month of the previous year. The cumulative gross production of natural gas of 2827 MMSCM for the current financial year till April 2022 was higher by 6.6% compared with the corresponding period of the previous year.

3. **Crude Oil Processed (Crude Throughput)**

Crude oil processed during April 2022 was 21.6 MMT, which was 8.5 % higher than April 2021 as compared to a growth of 6.4 % during March 2021.

4. **Production of Petroleum Products**

Production of petroleum products saw a growth of 9.2 % during April 2022 over April 2021 as compared to a growth of 5.8 % during March 2021

Key Policy developments in Energy sector

- **Cabinet approves Amendments to the National Policy on Biofuels -2018**

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved the Amendments to the National Policy on Biofuels -2018. The "National Policy on Biofuels - 2018" was notified by Ministry of Petroleum and Natural Gas on 04.06.2018 in super session of National Policy on Biofuels, promulgated through the Ministry of New & Renewable Energy, in 2009.

Due to advancements in the field of Biofuels, various decisions taken in the National Biofuel Coordination Committee (NBCC) meetings to increase biofuel production, recommendation of the Standing Committee and the decision to advance to introduce Ethanol Blended Petrol with up to twenty per cent ethanol throughout the country from 01.04.2023, amendments are done to the National Policy on Biofuels.

The following are the main amendments approved to the National Policy on Biofuels:

i. to allow more feedstocks for production of biofuels,
ii. to advance the ethanol blending target of 20% blending of ethanol in petrol to ESY 2025-26 from 2030,
iii. to promote the production of biofuels in the country, under the Make in India program, by units located in Special Economic Zones (SEZ)/ Export Oriented Units (EoUs),
iv. to add new members to the NBCC.
v. to grant permission for export of biofuels in specific cases, and
vi. to delete/amend certain phrases in the Policy in line with decisions taken during the meetings of National Biofuel Coordination Committee.

This proposal will also attract and foster developments of indigenous technologies which will pave the way for Make in India drive, generate more employment and give an impetus to Prime Minister's vision of India becoming 'energy independent' by 2047.

- **Leading Oil PSUs come together to sign Tripartite-cum-Escrow Agreement for upcoming dedicated ethanol plants**

The Oil Marketing Companies (OMCs) - Bharat Petroleum Corporation Limited (BPCL), Indian Oil Corporation Ltd (IOCL) and Hindustan Petroleum Corporation Limited (HPCL) have entered into a long-term purchase agreement (LTPA) for upcoming dedicated ethanol plants across India.

The first set of Tripartite-cum-Escrow Agreement (TPA) was signed among OMCs, project proponents and Banks of the respective ethanol plant projects in presence of Shri Sandeep Poundrik (IAS), Principal Secretary, Department of Industries, Govt. of Bihar, Shri Ashwani Bhatia, MD State Bank of India and Shri Sukhmal Jain, Executive Director I/C, Marketing Corporate, BPCL.

State Bank of India, Indian Overseas Bank and Indian Bank are three banks who are involved in this tripartite agreement with OMCs and project proponents. The agreement is designed to ensure that payment received by Ethanol plants is utilized for servicing the finance extended by these Banks. As per the agreement, ethanol produced by these dedicated ethanol plants shall be sold to OMCs for blending with Petrol as per Govt of India's Ethanol Blended Petrol (EBP) Program. Payment towards supply of ethanol shall be credited to escrow account maintained with the financing bank to ensure servicing of loan as per schedule.

TPAs were signed with Micromax Biofuels Pvt Ltd, Bihar, Eastern India Biofuels Pvt Ltd, Bihar, Muzaffarpur Biofuels Pvt Ltd, Bihar, K P Biofuels Pvt. Ltd, Madhya Pradesh and Visag Biofuels Private Limited, Madhya Pradesh.

- **National Open Access Registry (NOAR) goes live successfully**

National Open Access Registry (NOAR) has successfully gone live from 1st May 2022. NOAR has been designed as an integrated single window electronic platform accessible to all stakeholders including open access participants, traders, power exchanges, national/regional/state load dispatch centers for electronic processing of short-term open access application thereby automating the administration of the short-term open access in inter-state transmission system.

The NOAR platform shall act as a repository of information related to short term open access in inter-state transmission including standing clearance issued by RLDCs or SLDCs and short-term open access granted to the open access customers etc. and make such information available to the stakeholders online. Payment gateway provided for making payments and integrated with NOAR shall facilitate financial accounting and tracking of short-term open access transactions.

National Load Despatch Centre (NLDC) operated by Power System Operation Corporation Limited (POSOCO) has been designated as the nodal agency for implementation and operation of NOAR. NOAR would be the key to facilitate faster electricity markets and enable integration of Renewable Energy (RE) resources into the grid. NOAR will enable seamless market participation by the open access consumer with easier and faster access to the short-term electricity market, comprising of about 10% of all India demand.

- **State Level Steering Committees for Energy Transition**

Union Minister of Power and New & Renewable Energy, Shri R.K. Singh has asked the Chief Ministers of all States, and Lieutenant Governors of Union Territories to set up State Level Steering Committees for Energy Transition. These Steering Committees will work under the chairmanship of the Chief Secretaries of the respective States/Union Territories. The Principal Secretaries of Power and New and Renewable Energy Departments, Transport, Industries, Housing and Urban Affairs, Agriculture, Rural Development and Public Works Departments, etc. will act as members of these Committees. The States and Union Territories will work on the annual strategy of energy transition under the mandate of the committee.

The Minister reiterated that States/UTs have a vital role in meeting state-specific goals on sustainable development in the most energy-efficient way. He added that the energy transition is the only means of reducing carbon emissions and fulfilling our commitments made at international forums. He informed that some States like Andhra Pradesh, Kerala, Madhya Pradesh, and Uttarakhand have already constituted such committees.

Shri Singh highlighted that for energy transition, the States and Union Territories have to work together on multiple tracks. He added that the first track is the addition of Renewables (renewable energy) to the electricity generation mix to meet the nation's ever-increasing demand for electricity. He said that the second track would be the promotion of energy efficiency while the third one would be more use of biomass and green hydrogen.

- **Joint declaration of Intent on Indo – German Green Hydrogen Task Force signed**

Union Minister for Power and New and Renewable Energy Shri R.K Singh and German Minister for Economic Affairs and Climate Change HE Dr. Robert Habeck signed a Joint declaration of Intent on Indo-German Hydrogen Task Force virtually.

Shri Singh emphasized that India has huge ambitions in energy transition. It will add 500GW of non-fossil fuel capacity by 2030. India is coming out with bids for green hydrogen. The Minister further stressed on the need for developing storage for balancing RE such as pumped hydro and battery storage. It will also need large capacities of electrolysers manufacturing for Green Hydrogen for which India is already planning bids. He invited German industry to come and compete for developing this ecosystem in India.

Under the agreement which was signed both countries will establish an Indo-German Green Hydrogen Task Force to strengthen mutual cooperation in production, utilization, storage and distribution of Green Hydrogen through building enabling frameworks for projects, regulations and standards, trade and joint research and development (R&D) projects.

Trade of Green Hydrogen and/or its derivatives such as Green Ammonia / Green Methanol would form the cornerstone of the collaboration. Institutional collaboration in joint research, light house projects, innovation clusters and hydrogen hubs would catalyze the synergistic efforts of the two countries.

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