



# **POLICY PULSE**

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# ECONOMY

## GLOBAL ECONOMY

As per the latest World Economic Outlook report by the International Monetary Fund (IMF), the global economy is poised to slow this year, before rebounding next year. The IMF in its report said that global growth is expected to slow from 3.4% in 2022 to 2.9%.

*"The global economy will slow down this year before rebounding in 2024. But a global recession is not in our baseline. The important factors shaping the outlook are: On the downside, Russia's war in Ukraine and the global fight against inflation. On the upside, the reopening of China's economy. Overall, we have a mild upward revision to our projections. The global economy has shown a lot of resilience. Labor markets are tight, household spending and business investment remain strong, and European economies proved quite resilient against the energy crisis. Global growth is expected to slow from 3.4% in 2022 to 2.9% in 2023. The slowdown will be more pronounced for advanced economies. China and India will account for 50% of global growth. Global headline inflation is expected to fall from 8.8% in 2022 to 4.3% in 2024. Core inflation, however, is more persistent and remains too elevated. To sum up, barring new shocks, 2023 could be the year of turning points, with growth bottoming out and inflation decreasing,"* said Pierre-Olivier Gourinchas, IMF's Chief Economist.

Global GDP Projections (%)				
	2021	2022	2023	2024
<b>World Output</b>	<b>6.2</b>	<b>3.4</b>	<b>2.9</b>	<b>3.1</b>
<b>Advanced Economies</b>	<b>5.4</b>	<b>2.7</b>	<b>1.2</b>	<b>1.4</b>
United States	5.9	2.0	1.4	1.0
Euro Area	5.3	3.5	0.7	1.6
Germany	2.6	1.9	0.1	1.4
France	6.8	2.6	0.7	1.6
Italy	6.7	3.9	0.6	0.9
Spain	5.5	5.2	1.1	2.4
Japan	2.1	1.4	1.8	0.9
United Kingdom	7.6	4.1	-0.6	0.9
Canada	5.0	3.5	1.5	1.5
Other Advanced Economies	5.3	2.8	2.0	2.4
<b>Emerging Market and Developing Economies</b>	<b>6.7</b>	<b>3.9</b>	<b>4.0</b>	<b>4.2</b>
Emerging and Developing Asia	7.4	4.3	5.3	5.2
China	8.4	3.0	5.2	4.5
India	8.7	6.8	6.1	6.8
Emerging and Developing Europe	6.9	0.7	1.5	2.6
Russia	4.7	-2.2	0.3	2.1
Latin America and the Caribbean	7.0	3.9	1.8	2.1
Brazil	5.0	3.1	1.2	1.5
Mexico	4.7	3.1	1.7	1.6
Middle East and Central Asia	4.5	5.3	3.2	3.7
Saudi Arabia	3.2	8.7	2.6	3.4
Sub-Saharan Africa	4.7	3.8	3.8	4.1
Nigeria	3.6	3.0	3.2	2.9
South Africa	4.9	2.6	1.2	1.3
World Growth Based on Market Exchange Rates	6.0	3.1	2.4	2.5
European Union	5.5	3.7	0.7	1.8
ASEAN-5	3.8	5.2	4.3	4.7
Middle East and North Africa	4.1	5.4	3.2	3.5
Emerging Market and Middle-Income Economies	7.0	3.8	4.0	4.1
Low-Income Developing Countries	4.1	4.9	4.9	5.6
<b>World Trade Volume (goods and services) 6/</b>	<b>10.4</b>	<b>5.4</b>	<b>2.4</b>	<b>3.4</b>
Advanced Economies	9.4	6.6	2.3	2.7
Emerging Market and Developing Economies	12.1	3.4	2.6	4.6

Source: IMF

# ECONOMY

## GLOBAL ECONOMY

For advanced economies, growth is projected to decline sharply from 2.7 percent in 2022 to 1.2 percent in 2023 before rising to 1.4 percent in 2024, with a downward revision of 0.2 percentage point for 2024. About 90 percent of advanced economies are projected to see a decline in growth in 2023.

- In the United States, growth is projected to fall from 2.0 percent in 2022 to 1.4 percent in 2023 and 1.0 percent in 2024. With growth rebounding in the second half of 2024, growth in 2024 will be faster than in 2023 on a fourth-quarter-over-fourth-quarter basis, as in most advanced economies. There is a 0.4 percentage point upward revision for annual growth in 2023, reflecting carryover effects from domestic demand resilience in 2022, but a 0.2 percentage point downward revision of growth in 2024 due to the steeper path of Federal Reserve rate hikes, to a peak of about 5.1 percent in 2023.
- Growth in the euro area is projected to bottom out at 0.7 percent in 2023 before rising to 1.6 percent in 2024. The 0.2 percentage point upward revision to the forecast for 2023 reflects the effects of faster rate hikes by the European Central Bank and eroding real incomes, offset by the carryover from the 2022 outturn, lower wholesale energy prices, and additional announcements of fiscal purchasing power support in the form of energy price controls and cash transfers.
- Growth in the United Kingdom is projected to be -0.6 percent in 2023, a 0.9 percentage point downward revision from October, reflecting tighter fiscal and monetary policies and financial conditions and still-high energy retail prices weighing on household budgets.
- Growth in Japan is projected to rise to 1.8 percent in 2023, with continued monetary and fiscal policy support. High corporate profits from a depreciated yen and earlier delays in implementing previous projects will support business investment. In 2024, growth is expected to decline to 0.9 percent as the effects of past stimulus dissipate.
- For emerging market and developing economies, growth is projected to rise modestly, from 3.9 percent in 2022 to 4.0 percent in 2023 and 4.2 percent in 2024, with an upward revision of 0.3 percentage point for 2023 and a downward revision of 0.1 percentage point for 2024. About half of emerging market and developing economies have lower growth in 2023 than in 2022.
- Growth in emerging and developing Asia is expected to rise in 2023 and 2024 to 5.3 percent and 5.2 percent, respectively, after the deeper-than-expected slowdown in 2022 to 4.3 percent attributable to China's economy. China's real GDP slowdown in the fourth quarter of 2022 implies a 0.2 percentage point downgrade for 2022 growth to 3.0 percent—the first time in more than 40 years with China's growth below the global average.

## GLOBAL ECONOMY

- Growth in China is projected to rise to 5.2 percent in 2023, reflecting rapidly improving mobility, and to fall to 4.5 percent in 2024 before settling at below 4 percent over the medium term amid declining business dynamism and slow progress on structural reforms. Growth in India is set to decline from 6.8 percent in 2022 to 6.1 percent in 2023 before picking up to 6.8 percent in 2024, with resilient domestic demand despite external headwinds. Growth in the ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore, Thailand) is similarly projected to slow to 4.3 percent in 2023 and then pick up to 4.7 percent in 2024.

Growth in emerging and developing Europe is projected to have bottomed out in 2022 at 0.7 percent and, since the October forecast, has been revised up for 2023 by 0.9 percentage point to 1.5 percent. This reflects a smaller economic contraction in Russia in 2022 (estimated at -2.2 percent compared with a predicted -3.4 percent) followed by modestly positive growth in 2023. At the current oil price cap level of the Group of Seven, Russian crude oil export volumes are not expected to be significantly affected, with Russian trade continuing to be redirected from sanctioning to non-sanctioning countries.

- In Latin America and the Caribbean, growth is projected to decline from 3.9 percent in 2022 to 1.8 percent in 2023, with an upward revision for 2023 of 0.1 percentage point since October. The forecast revision reflects upgrades of 0.2 percentage point for Brazil and 0.5 percentage point for Mexico due to unexpected domestic demand resilience, higher-than-expected growth in major trading partner economies, and in Brazil, greater-than-expected fiscal support. Growth in the region is projected to rise to 2.1 percent in 2024, although with a downward revision of 0.3 percentage point, reflecting tighter financial conditions, lower prices of exported commodities, and downward revisions to trading partner growth.
- Growth in the Middle East and Central Asia is projected to decline from 5.3 percent in 2022 to 3.2 percent in 2023, with a downward revision of 0.4 percentage point since October, mainly attributable to a steeper-than-expected growth slowdown in Saudi Arabia, from 8.7 percent in 2022 (which was stronger than expected by 1.1 percentage points) to 2.6 percent in 2023, with a negative revision of 1.1 percentage points. The downgrade for 2023 reflects mainly lower oil production in line with an agreement through OPEC+ (Organization of the Petroleum Exporting Countries, including Russia and other non-OPEC oil exporters), while non-oil growth is expected to remain robust.
- In sub-Saharan Africa, growth is projected to remain moderate at 3.8 percent in 2023 amid prolonged fallout from the COVID-19 pandemic, although with a modest upward revision since October, before picking up to 4.1 percent in 2024. The small upward revision for 2023 (0.1 percentage point) reflects Nigeria's rising growth in 2023 due to measures to address insecurity issues in the oil sector. In South Africa, by contrast, after a COVID-19 reopening rebound in 2022, projected growth more than halves in 2023, to 1.2 percent, reflecting weaker external demand, power shortages, and structural constraints.

# ECONOMY

## GLOBAL ECONOMY

### Inflation

About 84 percent of countries are expected to have lower headline (consumer price index) inflation in 2023 than in 2022. Global inflation is set to fall from 8.8 percent in 2022 (annual average) to 6.6 percent in 2023 and 4.3 percent in 2024—above pre-pandemic (2017–19) levels of about 3.5 percent. The projected disinflation partly reflects declining international fuel and nonfuel commodity prices due to weaker global demand. It also reflects the cooling effects of monetary policy tightening on underlying (core) inflation, which globally is expected to decline from 6.9 percent in the fourth quarter of 2022 (year over year) to 4.5 percent by the fourth quarter of 2023. Still, disinflation will take time: by 2024, projected annual average headline and core inflation will, respectively, still be above pre-pandemic levels in 82 percent and 86 percent of economies.

In advanced economies, annual average inflation is projected to decline from 7.3 percent in 2022 to 4.6 percent in 2023 and 2.6 percent in 2024—above target in several cases. In emerging market and developing economies, projected annual inflation declines from 9.9 percent in 2022 to 8.1 percent in 2023 and 5.5 percent in 2024, above the 4.9 percent pre-pandemic (2017–19) average. In low-income developing countries, inflation is projected to moderate from 14.2 percent in 2022 to 8.6 percent in 2024—still high, but close to the pre-pandemic average.

# ECONOMY

## INDIAN ECONOMY

As per the World Bank in its latest India Development Update, India's economy has demonstrated resilience despite a challenging external environment. The report titled "Navigating the Storm", finds that while the deteriorating external environment will weigh on India's growth prospects, the economy is relatively well positioned to weather global spillovers compared to most other emerging markets.

Impact of a tightening global monetary policy cycle, slowing global growth and elevated commodity prices will mean that the Indian economy will experience lower growth in 2022-23 financial year compared to 2021-22. Despite these challenges, the update expects India to register a strong GDP growth and remain one of the fastest growing major economies in the world, due to robust domestic demand.

The World Bank has revised its 2022-23 GDP forecast upward to 6.9 percent from 6.5 percent (in October 2022), considering a strong outturn in India in the second quarter (July-September) of the 2022-23 financial year. "India's economy has been remarkably resilient to the deteriorating external environment, and strong macroeconomic fundamentals have placed it in good stead compared to other emerging market economies," said Auguste Tano Kouame, World Bank's Country Director in India. "However, continued vigilance is required as adverse global developments persist."

The report forecasts that the India economy will grow at slightly lower rate of 6.6 percent in the 2023-24 fiscal year. A challenging external environment will affect India's economic outlook through different channels. The report states that rapid monetary policy tightening in advanced economies has already resulted in large portfolio outflows and depreciation of the Indian Rupee while high global commodity prices have led to a widening of the current account deficit.

However, it argues that India's economy is relatively insulated from global spillovers compared to other emerging markets. This is partly because India has a large domestic market and is relatively less exposed to international trade flows. The report finds that while a 1 percentage point decline in growth in the US is associated with a 0.4 percentage point decline in India's growth, the effect is around 1.5 times larger for other emerging economies. Analysis for growth spillovers from the EU and China also yields similar results.

# ECONOMY

## INDIAN ECONOMY

### Performance of Key Indicators

The combined Index of Eight Core Industries (ICI) increased by 7.4 per cent (provisional) in December 2022 as compared to the Index of December 2021. The production of Coal, Electricity, Steel, Cement, Fertilizers, Refinery Products and Natural Gas increased in December 2022 over the corresponding month of last year.

**Coal production** (weight: 10.33 per cent) increased by 11.5 per cent in December, 2022 over December, 2021. Its cumulative index increased by 16.4 per cent during April to December 2022 over corresponding period of the previous year.

**Crude Oil production** (weight: 8.98 per cent) declined by 1.2 per cent in December, 2022 over December, 2021. Its cumulative index declined by 1.3 per cent during April to December, 2022 over the corresponding period of previous year.

**Natural Gas** (weight: 6.88 per cent) increased by 2.6 per cent in December, 2022 over December, 2021. Its cumulative index increased by 0.9 per cent during April to December, 2022 over the corresponding period of previous year.

**Petroleum Refinery** (weight: 28.04 per cent) increased by 3.7 per cent in December, 2022 over December, 2021. Its cumulative index increased by 5.5 per cent during April to December, 2022 over the corresponding period of previous year.

**Fertilizers** (weight: 2.63 per cent) increased by 7.3 per cent in December, 2022 over December, 2021. Its cumulative index increased by 9.6 per cent during April to December, 2022 over the corresponding period of previous year.

**Steel** (weight: 17.92 per cent) increased by 9.2 per cent in December, 2022 over December, 2021. Its cumulative index increased by 7.7 per cent during April to December, 2022 over the corresponding period of previous year.

**Cement** (weight: 5.37 per cent) increased by 9.1 per cent in December, 2022 over December, 2021. Its cumulative index increased by 10.6 per cent during April to December, 2022 over the corresponding period of previous year.

**Electricity generation** (weight: 19.85 per cent) increased by 10.0 per cent in December, 2022 over December, 2021. Its cumulative index increased by 9.8 per cent during April to December, 2022 over the corresponding period of previous year.

As per data released by Ministry of Statistics, the Index of Industrial Production (IIP) grew by 1 per cent in November 2021. IIP growth returned to positive territory in November at 7.1 per cent after it contracted by 4 per cent in October.

As per Ministry of Finance, the gross GST revenue collected in the month of January 2023 is Rs 1,55,922 crore (US\$ 18.8 billion) of which CGST is Rs 28,963 crore (US\$ 3.5 billion), SGST is Rs 36,730 crore (US\$ 4.4), IGST is Rs 79,599 crore (US\$ 9.6 billion) and cess is Rs 10,630 crore (US\$ 1.2 billion).

# WTO UPDATES

## Germany provides support for safe agriculture trade to developing countries



Germany recently announced its commitment to contribute EUR 2.85 million to the Standards and Trade Development Facility (STDF) over a period of four years (2022-2025). The STDF is a global multi-stakeholder partnership focusing on safe and inclusive trade. The Development Facility mainly wants to achieve outcomes such as sustainable economic growth, food security and poverty reduction, in support of the United Nations' Sustainable Development Goals. Germany's contribution will mainly be targeted at helping developing and least-developed countries (LDCs) meet international food safety, animal and plant health standards for the growth of safe and inclusive agricultural trade.

The contribution will improve food safety systems by enhancing SPS capacity, reducing trade barriers and trade costs in developing countries. The funding will also strengthen the STDF's knowledge platform, which connects diverse stakeholders from across agriculture, health, trade and development to identify and disseminate good practice.

In addition, it is expected to encourage exchange of information about innovative and collaborative approaches to enhance SPS work globally.

# FREE TRADE AGREEMENT/ BILATERAL DISCUSSIONS

## INDIA

### 7th Round of India and UK FTA Negotiation: Both Parties are committed to move quickly on key topics



The intent to conclude an FTA deal is strong on both sides, despite political ambitions that are delaying the negotiations. The last negotiations saw little progress on the deal which took place on 16th December. Before the next round or the 7th round, UK Trade Secretary Kemi Badenoch scheduled a meeting with the Commerce and Industry Minister, Shri Piyush Goyal to make some progress. During her visit, she announced that the U.K. is unlikely to consider increasing the number of student visas and specific visas for the under-35s. The discussion on Mode-IV, i.e., the movement of natural persons, has created conflicts earlier and had delayed the finalization of the deal by Diwali.

The U.K. is concerned as Indians are already the largest recipient of 'Skilled Worker' visas, as revealed by data. The issue of Visas may, however, may stop being a challenge. While there were speculations earlier that the announcement may impede the progress made early.

Union Commerce Minister Piyush Goyal issued a clarification, in which he stated that student visas were never part of a free trade agreement (FTA). According to the Commerce Minister, discussions for the proposed free trade agreement between India and the United Kingdom are focused on what is acceptable to both countries.

A recent statement by a U.K. Foreign Office minister also asserted that the negotiations between India and U.K for a Free Trade Agreement (FTA) are "well advanced." The issue of Business mobility is likely to remain an area of discussion in the negotiations. Both parties are hopeful that the next round of discussions, started on 6th February 2023 likely to yield fruitful results. Main focus of the discussion will be tariffs on goods, services, and intellectual Property Rights (IPR) and other topics which may get focus are Procurement, State Owned Enterprises, etc.

### India and EU agreed to include WTO+ provisions in FTA



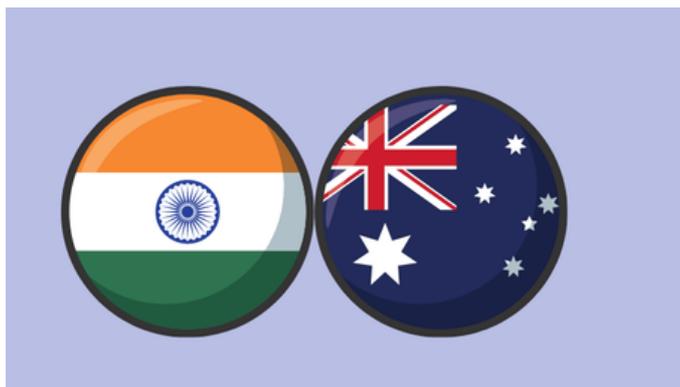
Last year, India and the EU relaunched negotiations on a trade deal after a gap of almost a decade.

# FREE TRADE AGREEMENT/ BILATERAL DISCUSSIONS

## INDIA

The two sides have concluded at least three rounds of discussions. A major outcome of the negotiations has been a consensus of the two sides to likely use WTO+ provisions in certain areas of their trade agreement. This will allow both sides to intensify their bilateral work on global issues such as Climate Change but experts fear a disadvantage to Indian exports. However, India is unlikely to agree to any provisions that may harm its interests in sensitive sectors such as agriculture and jobs. Therefore, issues like environment and sustainability might be tricky for both sides to negotiate. The fourth round of EU-India FTA negotiations will be held in Brussels from 13 to 17 March 2023.

### India-Australia ECTA comes into force



India and Australia Economic Cooperation and Trade Agreement (ECTA) which was signed last year has come into force on 29th December 2022. Labor-intensive Indian sectors that are currently subjected to 5% import duty by Australia, will mainly benefit from this agreement.

Trade of pharmaceutical products will see a boost as both sides have enabled fast-track approval for patented, generic and biosimilar medicines. Immediate duty-free Access to India is expected to result in additional exports of \$ 10 bn to Australia in the next five years. The agreement provides immediate market access at zero duty to 96.4% of India's exports to Australia in value terms. In addition, Australia is expected to offer duty elimination on 100% of its tariff lines over 5 years.

Likewise, India is offering zero duty access to 90% value of products from Australia (including coal). While duty will be eliminated on 85.3% value of products immediately, the zero duty will be applicable on 3.67 % value of products progressively over the years. India has also offered duty concessions on various items of interest to Australia including Coking coal and Thermal coal, Wines, Agricultural products – 7 of them with TRQ (Cotton, Almonds shelled and in shell, Mandarin, Oranges, Lentils, Pear), Metals (Aluminium, Copper, Nickel, Iron & Steel) and Minerals (Manganese Ore, Calcined Alumina). Many sensitive products such as milk and other dairy products, wheat, sugar, iron ore, apple, walnuts and others, have been kept in India's Exclusion list.

# FREE TRADE AGREEMENT/ BILATERAL DISCUSSIONS

## INDIA/ OTHERS

### India-Vietnam to commence talks on trade



Talks on a potential trade agreement between India and Vietnam are expected to begin soon. For this purpose, a joint Indo-Vietnamese working group is likely to be formed in the coming months. The Joint working group will mainly explore the feasibility of the trade pact. A joint meeting between both countries is expected to be held by March-end, where prospects of a trade agreement can be discussed.

At present, India mainly exports metals, machinery, electronics and electronic equipment, and agricultural products to Vietnam. India's exports to Vietnam saw an increase by 34% to \$6.7 billion in FY22. Top imported goods from Vietnam, includes electronic equipment, chemicals, machinery and animal feed.

### OTHERS

### Ecuador-China concludes FTA Negotiations



China and Ecuador recently concluded negotiations for a free trade agreement (FTA) on a technical level. About four rounds of negotiations and dozens of technical meetings have happened between the two countries. The two sides have started negotiations in February 2022. With the entry into force, China will provide preferential market access to 99 percent of exports from Ecuador. The deal will mainly give a boost to Ecuador's agricultural and agro-industrial products exports such as shrimp, bananas, roses and flowers, cocoa, and coffee, etc. It will also provide an opportunity for Ecuador to grow its non-traditional exports to China. Overall, the country is expecting additional exports worth \$1 billion to China, through this deal. The agreement also establishes mechanisms in the sanitary and phytosanitary field to help speed up market access processes.

# FREE TRADE AGREEMENT/ BILATERAL DISCUSSIONS

## OTHERS

### UK: National Health Services not on the table for negotiations with GCC



A second round of negotiations for a Free Trade Agreement (FTA) between the UK and the GCC took place between 5 and 9 December. During this round, the two sides had technical discussions across 29 policy areas over 36 sessions. Analysis by UK government indicates that a deal with the GCC will increase trade by at least 16%, and add at least £1.6 billion a year to the UK economy as well as improve UK workers' annual wages in the long-term. However, a statement by UK asserted that it will not offer the National Health Service and the services it provides on table for trade negotiations. UK also stated that high environmental, public health, animal welfare and food standards will not be compromised to reach a deal with GCC. The country also added that it will maintain its right to regulate in the public interest.

## National Green Hydrogen Mission

The Union Cabinet, chaired by the Hon'ble Prime Minister Shri Narendra Modi, has approved National Green Hydrogen Mission. The initial outlay for the Mission will be Rs.19,744 crore, including an outlay of Rs.17,490 crore for the SIGHT programme, Rs.1,466 crore for pilot projects, Rs.400 crore for R&D, and Rs. 388 crore towards other Mission components.

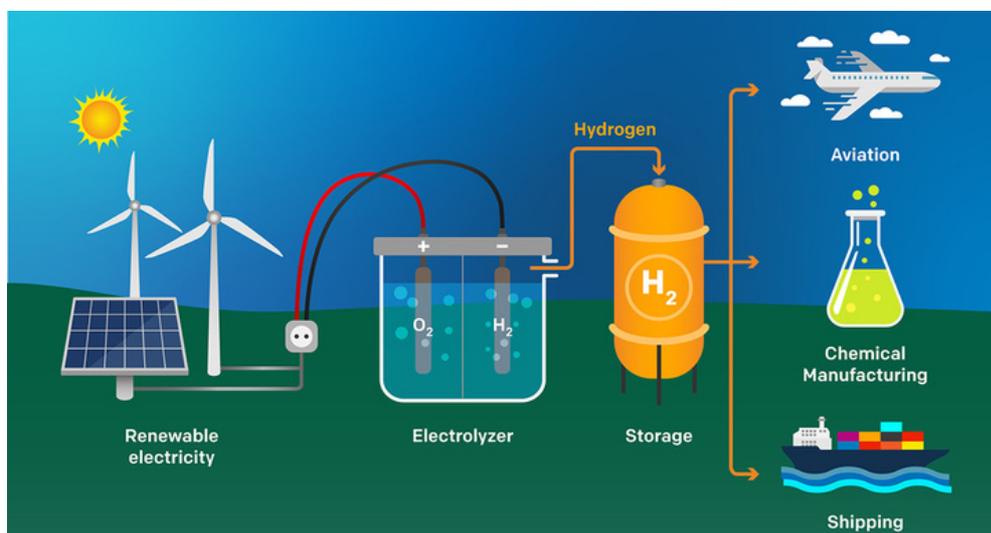
The mission's objective is to develop a green hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum, alongside adding renewable energy capacity of about 125 GW (gigawatt) in India by 2030. It also aims to entail over Rs 8 lakh crore of total investments which is expected to create six lakh jobs. It will also lead to a cumulative reduction in fossil fuel imports by over Rs 1 lakh crore and an abatement of nearly 50 MT of annual greenhouse gas emissions.

The Mission strategy accordingly comprises interventions for (i) demand creation by making Green Hydrogen

produced in India competitive for exports and through domestic consumption. (ii) addressing supply-side constraints through an incentive framework, and (iii) building an enabling ecosystem to support scaling and development.

The mission will be implemented in two phases, first phase is focused on the creation of demand while ensuring adequate supply by increasing domestic electrolyzer manufacturing capacity. This phase will also create a foundation of research and development for future energy transitions and establish a framework of regulations and standards to facilitate the growth of the sector.

The second phase of green hydrogen costs is expected to become competitive with fossil-fuel alternatives in the refinery and fertiliser sectors. Depending on the costs and market demand, the potential for commercial scale in the steel, transportation, and shipping sectors. Parallely, pilot projects in other potential sectors like railways, aviation etc. are proposed.



# POLICY/ REGULATORY UPDATES

According to NITI Aayog, green hydrogen prices are determined largely by the cost of electrolyzers and electricity. Beyond that, there are the operating costs, transmission and distribution (T&D) costs, and wheeling charges for electricity as well as specific local duties and taxes like GST in India.

'The cost of hydrogen from electrolysis currently is relatively high, between around \$7/kg and \$4.10/kg depending on various technology choices and the associated soft costs. This makes it hard to compete with the existing cost of grey or brown hydrogen. But India has some of the most competitive levelized costs of electricity (LCOE) for solar and wind in the world while remaining a net importer of natural gas. Given the promises of electrolyser cost and LCOE decline, it is more beneficial to expand green hydrogen production in India rather than the production of grey or blue hydrogen,' the NITI Aayog on Harnessing Green Hydrogen.

## **Meghalaya Cabinet nod Tourism Policy, Organic & Farming Policy 2023**

The tourism sector plays a prominent role in providing livelihood opportunities to almost 50,000 people in the State. Further, it has been estimated that the sector contributes about 4.1% to the State's GSDP.

Chief Minister Conrad K Sangma said the new policy would properly shape and structure the tourism sector by looking into various aspects such as sustainability, employment generation,

entrepreneurship, community participation, usage of technology, livelihood, etc. Further, added that the focus needs to be laid on certain areas such as better infrastructure as well as the safety of tourists.



Meghalaya State Organic & Farming Policy 2023 to further our efforts towards Organic Farming in Meghalaya. The Policy will streamline the plan of action and will look into aspects of organic certification of produce. The Bio-Resources Development Centre (Government of Meghalaya Institute under the Science & Technology Planning Department) has already been appointed to provide organic certification, and many other state institutions will surely follow. Further, the policy will set up outlets and consumption centres where citizens can buy organic food.



## Jammu and Kashmir Govt approve roadmap for poultry development

To put the poultry sector on the path of sustainability and self-reliance, the agriculture production department has approved a "roadmap for poultry development in J&K" under its mission for holistic development of agriculture and allied sectors in the Union Territory. The roadmap is to boost the poultry sector's annual output from Rs 709 crore to Rs 1,982 crore in the Union Territory.

As per the Additional Chief Secretary, of the Agricultural Production Department, Atal Dulloo, "Every year the Union Territory experiences a flight of capital on account of poultry imports to the tune of Rs 1,273 crore. Among these table eggs account for Rs 473 crore, day-old chicks for Rs 110 crore, poultry feed worth Rs 300 crore and broiler birds for Rs 390 crore,". This roadmap will be an opportunity for local enterprises and create jobs for the educated youth.



According to Dr Azmat Alam Khan, Professor of Poultry Sciences at Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir, "The project encompasses all three verticals in the poultry industry including producing day-old broiler chicken to feed the broiler industry, establishing layer farms in intensive and free-range mode to meet the demands for eggs and boosting quality feed manufacture through the establishment of feed processing units,".

Currently, the UT imports 440 lakh day-old chicks worth Rs 110 crores per year. The birds are transported for more than two days, which causes stress and reduces productivity. To address this, 125 parent breeding farms (each with a 3000-parent capacity), hatcheries, and in-house feed manufacturing units will be developed over a five-year period, each with a production capacity of 4 lakh day-old chicks. This would make it easier to achieve self-sufficiency in day-old chicks in five years.

The roadmap will also address one main challenge of expensive poultry feed. As the projects are project which aim to produce 85,000 metric tonnes of chicken feed in five years by creating 35 units (7 feed units per year) with a capacity of 1 tonne per hour.

## Smart Manufacturing Akriti Kumari

### Cloud Infrastructure

Virtual infrastructure enables all essential components to be connected and networked with optimally developed data highways. It is the central link to the cloud, the digital superstructure which holds the resources of entire data centres, security solutions and various storage functions without requiring a particular location.

In easy language, I would say, it is the collection of hardware and software elements needed to enable cloud computing. It includes computing power, networking, and storage, as well as an interface for users to access their virtualized resources. The virtual resources mirror a physical infrastructure, with components like servers, network switches, memory and storage clusters.

### Why Cloud Computing Infrastructure?

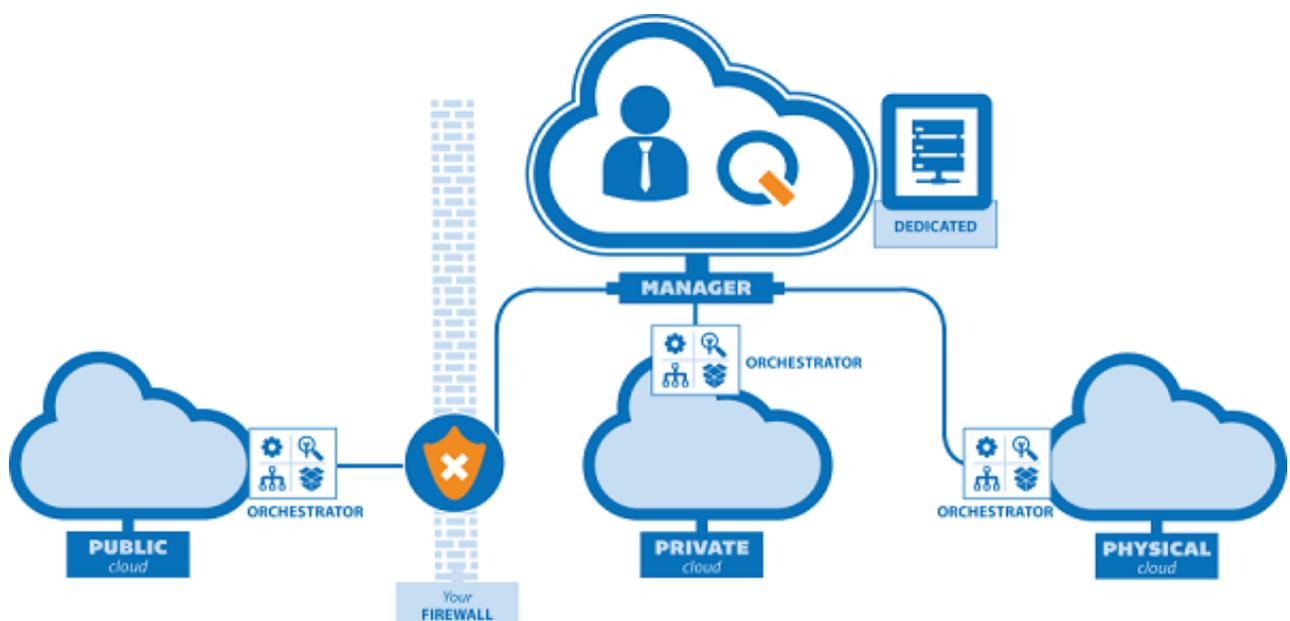
Cloud infrastructure offers the same capabilities as physical infrastructure but

can provide additional benefits like a lower cost of ownership, greater flexibility, and scalability.

Cloud computing infrastructure is available for private cloud, public cloud, and hybrid cloud systems. It's also possible to rent cloud infrastructure components from a cloud provider, through cloud infrastructure as a service. Cloud infrastructure systems allow for integrated hardware and software and can provide a single management platform for multiple clouds.

### How does Cloud Infrastructure work?

An abstraction technology or process, like virtualization is used to separate resources from physical hardware and pool them into clouds; automation software and management tools allocate these resources and provision new environments so users can access what and when they need it.



## Components of Cloud Infrastructure

<p style="text-align: center;"><b>Hardware</b></p> <ul style="list-style-type: none"><li>• A cloud network is made up of a variety of physical hardware that can be located at multiple geographical locations.</li><li>• The hardware includes networking equipment, like switches, routers, firewalls, and load balancers, storage arrays, backup devices, and servers.</li><li>• Virtualization connects the servers together, dividing and abstracting resources to make them accessible to users.</li></ul>	<p style="text-align: center;"><b>Virtualization</b></p> <ul style="list-style-type: none"><li>• Virtualization is a technology that separates IT services and functions from hardware.</li><li>• Software called a hypervisor sits on top of physical hardware and abstracts the machine's resources, such as memory, computing power, and storage.</li><li>• Once these virtual resources are allocated into centralized pools, they're considered clouds.</li><li>• With clouds, user get the benefits of self-service access, automated infrastructure scaling, and dynamic resource pools.</li></ul>
<p style="text-align: center;"><b>Storage</b></p> <ul style="list-style-type: none"><li>• Storage management ensures data is correctly being backed up, that outdated backups are removed regularly, and that data is indexed for retrieval in case any storage component fails.</li><li>• Virtualization abstracts storage space from hardware systems so that it can be accessed by users as cloud storage.</li><li>• When storage is turned into a cloud resource, user can add or remove drives, repurpose hardware, and respond to change without manually provisioning separate storage servers for every new initiative.</li></ul>	<p style="text-align: center;"><b>Network</b></p> <ul style="list-style-type: none"><li>• The network is composed of physical wires, switches, routers, and other equipment. Virtual networks are created on top of these physical resources.</li><li>• A typical cloud network configuration is composed of multiple subnetworks, each with varying levels of visibility. The cloud permits the creation of virtual local area networks (VLANs) and assigns static and/or dynamic addresses as needed for all network resources.</li><li>• The cloud resources are delivered to users over a network, such as the internet or an intranet, so user can access cloud services or apps remotely on demand.</li></ul>

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## Advantages of using cloud infrastructure

- **Flexibility** - Customers can procure resources that are rapidly accessible and self-manage the resources to better align to business needs. This is particularly valuable to burst on-premises workloads into the cloud to utilize extra resources.
- **Reliability** - Cloud providers' expansive infrastructure and redundancy options through availability zones deliver reliability at a scale beyond any single customer's in-house resources. Outages are rare but do occur, so customers should plan cloud usage based on their workloads' reliability and uptime requirements.
- **Cost** - Using cloud infrastructure eliminates upfront capital costs associated with on-premises infrastructure and instead follows a consumption-based model. This pay-per-usage model charges users only for the infrastructure services they consume, generally on an hourly, weekly or monthly basis.
- **Security** - Initial concerns about the security of public cloud resources are diminished. Cloud providers constantly invest in and improve their abilities to protect their infrastructure from security threats. Most cloud security issues can be traced to user misconfigurations of individual services, rather than external bad actors.

## Disadvantages of cloud infrastructure

- **Shared security** - Although cloud providers are vigilant to secure their cloud infrastructure, it's exceedingly complex to oversee that scale of infrastructure and services. Moreover, the shared responsibility model means providers only secure their infrastructure -- customers are responsible for protecting their workloads and data through proper configuration, access controls and monitoring.
- **Visibility and management** - The virtualization layer of a cloud infrastructure generally means customers do not have visibility into the actual physical hardware upon which their workloads run.

So, it means that Cloud infrastructure is required in an organization to support environmental proactivity, powering virtual services rather than physical products and hardware, and cutting down on paper waste, improving energy efficiency, and reducing commuter-related emissions.

(The writer is a Senior Research Analyst at VeKommunicate)

# OPINION COLUMN

## *Geopolitics Behind the Clutter Anjali Mahto*

### **Climate action and cost of trade**



Climate action has become crucial for our collective sustainable future. Countries are racing towards implementing various strategies, measures, and tools to address climate change. Trade is also being utilized to address various climate challenges and to promote green goods and services. Trade measures can promote the incentives to invest in climate change. However, some of the trade measures in recent times to deliver climate action are becoming more restrictive and punitive.

For instance, European Union (EU) is expected to introduce a carbon border tax regime in 2026, with a transitional phase beginning in 2023, which would require companies to report their carbon emissions.

The tax measure will likely impose additional import duties on certain products of other countries. Exports of steel, cement, fertilisers, aluminium and electricity are likely to be impacted. According to a statement by EU, "CBAM will equalise the price of carbon between domestic products and import."

Another policy proposal by EU to reduce deforestation, is expected to restrict the exports of certain agricultural commodities such as palm oil. EU has proposed to introduce a system in which certificates based claims will be required to be made that certain traded agriculture goods were not produced on land deforested after the end of 2020.

Punitive trade measures mainly affect developing countries that already face difficulty in accessing green finance to invest in their industrial production and economy. Globally, there is an existing gap in access to green finance as its cost is higher for developing countries. In addition, the need of climate investment is also more in developing countries (4-9 per cent of their GDP).

For developed countries, climate investment requirement is close to 0.5% of GDP, according to an IPCC Report on Mitigation. When developing countries face a challenge in exporting to other countries because of climate-related restrictive measures, it harms their domestic industry growth. The growth of the industry is important for countries to scale their finances which can be used to fund green investments. Therefore, restrictive trade measures in long term can likely lead to decline in green investments.

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Meanwhile, measures that provide trade based incentives to developing countries to invest in building their green industrial growth, will provide likely support in also scaling up funds for green investments. While the countries are looking to use trade measures to decarbonise their supply chains, they shall also remember the role of green financing for the development of sustainable supply chains.

(The writer is an Account Executive at VeKommunicate)

## Environment Equity

Saloni Goyal

### Waste Heat Recovery System

Waste Heat Recovery system (WHRS), a process of capturing waste heat losses during an industrial process, has a critical role to play in energy-intensive industries such as Cement, Steel and Aluminium, among others. The captured waste heat losses can be utilised towards the generation of power and other productive use through ancillary equipment(s).

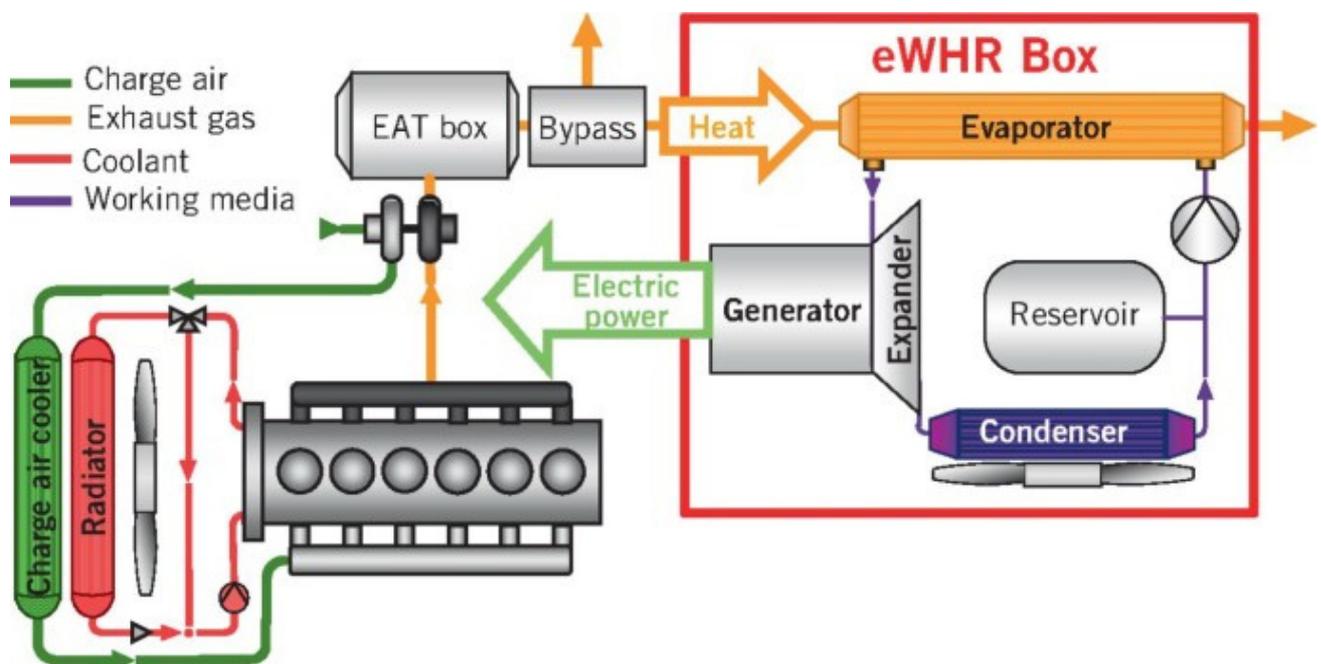
#### WHRS as sustainable manufacturing

While manufacturing, the higher the volume of production, the amount of resources consumed and emissions to the environment also increase. Sustainable Manufacturing is an approach that will lead to the production of required components using processes that reduce harmful environmental impacts, conserve energy and natural resources, and are cost-effective.

WHRS have a positive impact on the manufacturing sector such as improving efficiency and conserving energy. WHRS help to enhance efficiency on a large scale, like in large manufacturing facilities and production plants. With this system, a relatively small change can profoundly impact efficiency, on the industry level and a larger scale.

Then, WHRS can conserve resources and reduce waste as this can eliminate the need for another source of heat. Redirecting waste gas and reusing it as a heat source can reduce the waste produced by a facility and released into the atmosphere.

Further, on a plant level, implementing this system can reduce the plant's energy consumption. Every unit of captured waste heat directly replaces each unit of purchased energy. Repurposing this energy leads to huge savings in energy costs.



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## WHRs Globally

Globally, major manufacturing industries are actively adopting WHRS to decrease their dependence on conventional energy and produce in-house power to reduce working costs.

According to Acumen Research and Consulting, report the Global Waste Heat Recovery System Market Size accounted for USD 61.3 Billion in 2021 and is projected to occupy a market size of USD 128.8 Billion by 2030 growing at a CAGR of 8.7% from 2022 to 2030.

In 2021, North America dominated the waste heat recovery system market which is owing to increased demand for onsite power generation and expanding initiatives to deploy energy-efficient technologies. Government laws restricting harmful gas emissions have resulted in the conversion of existing industrial buildings, which will increase product demand even more.

In Europe, there is growing consumer awareness about the WHR system and European Union has taken measures to generate electricity from waste. In Europe, Germany is the main contributor to the WHRS market due to strict emission requirements meant to reduce GHG emissions.

## WHRs in India

Indian government initiatives aimed at energy conservation and reduction in energy costs are expected to drive the WHR market. For example, the Ministry of Environment, Forest and Climate Change,

relaxed the Environment Impact Notification [EIA], 2006 norms on January 23, 2019, exempting cement plants, integrated steel plants, metallurgical industries (ferrous and non-ferrous), thermal power plants and other industries that have the potential to recover heat, from obtaining environmental clearance.

Under the new norms, no “green” clearance is required for installing WHR boilers without any auxiliary fuel at captive power plants. The industries should be able to recover heat or utilise it for power generation to avail of this benefit.

According to the Bureau of Energy Efficiency, which has been promoting WHR under its Perform Achieve Trade scheme for several years now, WHR has a direct impact on efficiency. This is reflected in the reduction in utility consumption and costs, and process costs. It also reduces pollution, decreases equipment size by bringing down fuel consumption, and reduces auxiliary energy consumption.

On the other side, high initial investment costs and complexity in WHR system design are some of the challenges. In India, this can be solved with extensive research and development then the designs will improve and installation costs will reduce in the long term.

(The writer is an Account Executive at VeKommunicate)

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