

UPSC Syllabus Topic : GS Paper 3 Environment – Conservation, environmental pollution and degradation.

Navigating Towards Sustainability: The Quest for Sustainable Aviation Fuel and Synthetic Petrol

Sustainable Aviation Fuel (SAF) has emerged as a promising alternative in aviation, derived from biomass like used cooking oil, waste animal fat, and various agricultural by-products. The recent London-New York flight using 100% SAF marks a significant stride in environmental responsibility.

Benefits of SAF:

- 1. Emission Reduction:**
 - A 65% SAF fuel-mix can align with the ambitious emission targets set for 2050.
- 2. Carbon Footprint Reduction:**
 - Addressing the 10-12% contribution of civil aviation to transport-related greenhouse gas emissions.
- 3. Negative Carbon Footprint:**
 - Some SAF processes involve carbon dioxide capture and utilization of methane found in manure and sewage.
- 4. Compensation for Future Emissions:**
 - Widespread SAF usage can offset the carbon impact of modifying or replacing jet engines in aviation fleets.
- 5. Waste Recycling:**
 - Contributes to beneficial effects like biowaste recycling.

Government of India's Initiatives: The Indian government has taken steps to promote SAF by approving indicative blending percentages in Aviation Turbine Fuel (ATF):

- 1% SAF indicative blending target in 2027 (Initially for international flights).
- 2% SAF blending target in 2028 (Initially for international flights).

Roadblocks in Adoption:

- 1. High Cost:**
 - SAF is currently at least three times more expensive than traditional jet fuel.
- 2. Low Adoption:**
 - SAF constitutes less than 1% of the aviation fuel mix at present.

Synthetic Petrol: Synthetic petrol, derived from syngas (a mix of hydrogen and carbon monoxide), offers an alternative to traditional fuels. However, its adoption faces challenges.

Issues with Synthetic Petrol Adoption:

- 1. High Cost:**
 - Synthetic petrol is approximately five times more expensive than crude oil obtained through traditional refining.
- 2. Carbon Footprint of Transition:**
 - Transitioning billions of internal combustion vehicles to electrical propulsion poses a substantial carbon footprint.

Strategies for Greater Adoption:

- 1. Scaling up Production:**
 - Overcoming technological and engineering challenges through increased production and process enhancements.
- 2. Policy Support:**
 - Encouraging research into biomass and atmospheric carbon capture.
- 3. Subsidies:**
 - Implementing subsidies to facilitate the early adoption of synthetic fuels.

The journey towards widespread adoption of SAF and synthetic petrol requires collaborative efforts, innovative solutions, and sustained policy support to create a more sustainable and eco-friendly aviation industry.

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Transitioning Away from Coal – A Candid Evaluation

Efforts to curtail global greenhouse gas emissions fall short of the necessary measures to limit Earth's temperature rise to 1.5 degrees Celsius above pre-industrial levels. The commitment to triple renewable energy capacity by 2030 is pivotal, yet concerns persist, especially as India and China, significant contributors to emissions, have not endorsed the Global Renewables and Energy Efficiency Pledge.

India's Commitment: India, acknowledging the need for expanded renewable energy, aspires to reach 500 GW by 2030 through its Nationally Determined Contributions (NDC). The New Delhi Declaration of G20 reinforces this commitment. However, India remains cautious about endorsing the Global Pledge due to reservations surrounding the suggested "phase down of coal power and ending investment in new coal-fired power plants."

Why India Opposes Phasing Out Coal:

1. Energy Demand:

- India heavily relies on coal to meet its escalating energy demands, driven by population growth and industrialisation.

2. Economic Impact:

- Coal-related industries constitute a significant source of employment in India. Discontinuing coal could lead to job losses and economic disruptions.

3. Transitioning Costs:

- Shifting to alternative energy demands substantial investments in infrastructure, grid upgrades, and technology, posing challenges in terms of cost and implementation.

4. Reliability Concerns:

- While renewable sources like solar and wind are promising, their intermittency presents challenges in ensuring a consistent power supply.

5. Singular Focus on Coal:

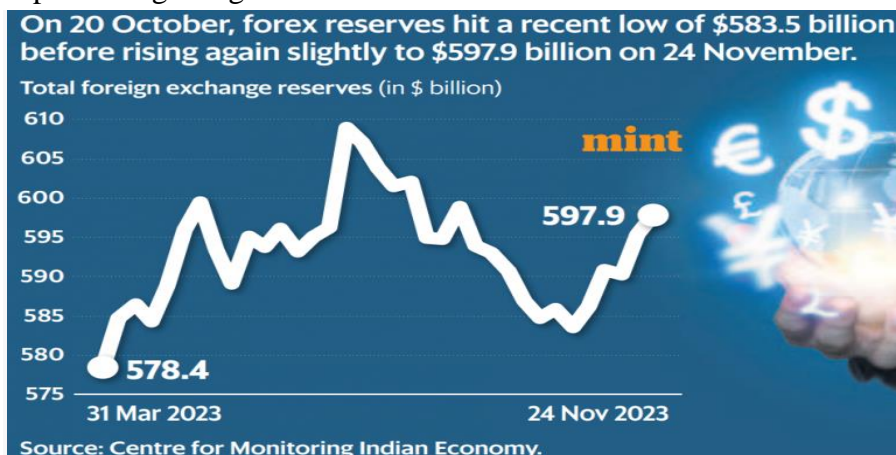
- India argues that developed nations committing to relinquish coal often have alternative fossil fuel resources, such as oil and gas. For instance, the USA draws only about 20% of its energy from coal, with a majority coming from oil and gas.

India's stance underscores the intricate balance between environmental responsibility and the practical considerations of a developing nation reliant on coal for its energy security and economic stability.

UPSC Syllabus Topic : GS Paper 3 Indian Economy and issues relating to planning and mobilization of resources.

Transitioning Away from Coal – A Candid Evaluation

As of 14th July, India's foreign exchange (forex) reserves amounted to \$609 billion. However, by 20th October, these reserves experienced a recent decline, reaching a low of \$583.5 billion, before experiencing a slight increase to \$597.9 billion on 24th November.



As of the latest available data, India's foreign exchange reserves stand at approximately \$597.9 billion. These reserves consist of various components:

1. **Gold:** Gold reserves serve as a financial buffer for emergencies. The proportion of gold in foreign exchange reserves has increased to around 7.7% from 7% a year earlier, driven by a nearly 15% rise in the price of gold in dollar terms.
2. **Foreign Currency Assets (FCAs):** FCAs constitute the majority of India's forex reserves and include major global currencies like the US dollar, euro, pound sterling, Japanese yen, etc. These are held in the form of securities such as treasury bills, bonds, and deposits in foreign central banks. The Reserve Bank of India (RBI) uses FCAs to actively manage the value of the rupee against the dollar.
3. **Special Drawing Rights (SDRs):** Allocated to member countries of the International Monetary Fund (IMF), including India, SDRs serve as an additional reserve asset. They represent a potential claim on the freely usable currencies of IMF members.
4. **Reserve Position in IMF:** This represents funds held in the IMF that a country can use based on its membership quota, particularly during critical situations like Balance of Payment (BOP) crises.

The management of forex reserves plays a crucial role in maintaining macroeconomic stability in India. The RBI utilizes these reserves to prevent excessive depreciation of the rupee against the dollar. For example, if the rupee is under pressure to depreciate, the RBI can sell dollars from its foreign currency assets, acquiring rupees in return. This helps maintain stability in the exchange rate and prevents a swift devaluation of the rupee.

The recent fluctuations in forex reserves can be attributed to changes in global economic conditions. When returns on US government bonds increased, foreign institutional investors (FIIs) sold Indian stocks and moved funds to the USA, putting pressure on the rupee. To counteract this, the RBI might have sold dollars from its reserves. Conversely, when returns on US government bonds fell, FIIs were encouraged to bring money back into India, relieving the pressure on the rupee. As a result, the forex reserves increased to close to \$598 billion.

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