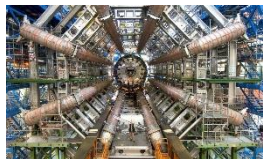


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FUTURE CIRCULAR COLLIDER (FCC)



- **Project scope:** A 91 km circular tunnel beneath the Swiss-French border, designed to accelerate and collide particles at **unprecedented energies**.
- **Purpose:** To generate **Higgs bosons in large numbers** (Phase 1, ~2040) and later to **collide protons at extreme energies** (Phase 2, ~2070).
- **Estimated cost:** \$30 billion (initial), with long-term funding implications for the next decades.
- **Supporters:** CERN leadership, senior physicists like **Fabiola Gianotti and Mark Thomson**, claim it will be **the most powerful instrument** to study nature.
- **Critics:** Many physicists fear the project will drain funds, limiting investment in other scientific advancements.

What is a Hadron?

- A **hadron** is a subatomic particle made of **quarks** and bound by the **strong nuclear force**.
- **Types of Hadrons:**
 - **Mesons** (e.g., pions, kaons)
 - **Baryons** (e.g., protons, neutrons)

What is the Large Hadron Collider (LHC)?

- **Location:** Franco-Swiss border, operated by **CERN**.
- **Size:** 27 km circular tunnel.
- **Purpose:** Collides **protons** at high energies to study fundamental forces and particles.
- **Discoveries:** **Higgs boson (2012)**, confirming the **Higgs field**, which gives particles mass.
- **Speed:** Accelerates particles to **999999% the speed of light**.

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GEOSTATIONARY TRANSFER ORBIT (GTO)



- ISRO has achieved a breakthrough in developing a semi-cryogenic engine (liquid oxygen/kerosene engine) with a high thrust of **2,000 kN** (kilonewtons).
- This engine will be used in the **semi-cryogenic booster stage of the Launch Vehicle Mark-3 (LVM3)**, enhancing India's space launch capabilities.

About Geosynchronous Transfer Orbit (GTO)

What is a Transfer Orbit?

- A Transfer Orbit is used to move a satellite from **one circular orbit to another** in a fuel-efficient manner.
- The **Hohmann Transfer Orbit** is a commonly used maneuver for such transfers.

Geostationary Transfer Orbit (GTO)

- GTO is a highly elliptical orbit with:
 - **Perigee (closest point to Earth):** 180-200 km above Earth's surface.
 - **Apogee (farthest point from Earth):** ~35,900 km (near geostationary orbit).
- **Why is GTO Used?**
 - Satellites are first placed in GTO before they use their **own propulsion system** to move to a **final geostationary orbit (GEO)**.
 - This **reduces the energy required from the launch vehicle**, making it more fuel-efficient.

What is a Semi-Cryogenic Engine?

A semi-cryogenic engine is a type of **liquid rocket engine** that uses:

- **Liquid Oxygen (LOX)** as an oxidiser (cryogenic component).
- **Refined kerosene (RP-1)** as fuel (stored at ambient temperature).



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Key Differences: Cryogenic vs Semi-Cryogenic Engines

Feature	Cryogenic Engine (LOX + LH2)	Semi-Cryogenic Engine (LOX + Kerosene)
Oxidizer used	Liquid Oxygen (LOX)	Liquid Oxygen (LOX)
Fuel used	Liquid Hydrogen (LH2)	Refined Kerosene (RP-1)
Storage	Requires ultra-cold storage (-253°C)	Can be stored at normal temperature
Efficiency	Lower density impulse	Higher density impulse (more efficient thrust)
Cost	Expensive	More cost-effective
Handling	Difficult to store and handle	Easier to store and handle
Used in	Cryogenic Upper Stages of rockets	Booster stages of heavy-lift launch vehicles

GOVT SCRAPS GOLD MONETISATION SCHEME: RBI CLARIFIES FATE OF EXISTING DEPOSITS

Gold Monetisation Scheme (GMS): An Overview

- Introduced in November 2015, the GMS aimed to make idle gold productive by allowing individuals and institutions to sell or deposit gold with banks.
- The goal was to integrate gold into the formal economy, reduce gold imports, and lower the current account deficit.

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Key Features

- Allowed deposits from households, trusts, and institutions.
- Minimum deposit: 10 gm of raw gold (bars, coins, jewellery without stones/metals).
- No maximum deposit limit.
- **Three Deposit Categories**
 - **Short-term bank deposits (1-3 years)** – Managed by banks.
 - **Medium-term government deposits (5-7 years)** – Managed by the government.
 - **Long-term government deposits (12-15 years)** – Managed by the government.
- **Gold Monetisation Scheme: Interest Rates**
 - **Short-Term Deposits**
 - Interest rates were determined by banks based on international lease rates, market conditions, and other costs.
 - Interest was borne by the banks.
 - **Medium- and Long-Term Deposits**
 - Interest rates were set by the government in consultation with the RBI.
 - Interest was paid by the Central government.
 - **Medium-term deposits (5-7 years):** 25% per annum
 - **Long-term deposits (12-15 years):** 5% per annum

Government and RBI on Gold Monetisation Scheme Closure

- **Discontinuation of the Scheme**
 - The **Ministry of Finance** announced the discontinuation of Medium- and Long-Term Government Deposits (MLTGD) under the GMS from March 26, 2025.
 - Only **short-term deposits** managed by banks will continue.
 - From **March 26, 2025**, no new deposits will be accepted at collection centers, testing agents, or designated bank branches.
- **Impact on Existing Deposits**

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- Existing medium- and long-term deposits remain unaffected and will continue until maturity unless withdrawn prematurely.
- The RBI has not issued a separate release but has updated the scheme details on its website.
- **RBI Guidelines**
 - The RBI will issue detailed guidelines regarding the scheme's closure.
 - It confirmed that the renewal of medium- and long-term deposits has been discontinued from March 26, 2025.

Gold Mobilised Under the Gold Monetisation Scheme

- **Total Gold Collected** - As of November 2024, a total of 31,164 kg of gold was mobilised under the scheme.
- **Breakdown by Deposit Type**
 - Short-term deposits: 7,509 kg
 - Medium-term deposits: 9,728 kg
 - Long-term deposits: 13,926 kg
- **Depositor Participation** - Total depositors: 5,693
- **Gold Collection from Different Sources**
 - From individuals/HUFs (FY 2016-17 & 2017-18): 1,134 kg
 - From temples, trusts, mutual funds, gold ETFs, and firms: 10,872 kg

CHICKEN'S NECK CORRIDOR



- 'Chicken's Neck', also known as the **Siliguri Corridor**, a narrow strip of land in West Bengal that connects India's northeastern states to the rest of the country.
- The corridor is situated in the northern part of West Bengal, spanning **approximately 22 kilometres at its narrowest point**.
- It is **flanked by Nepal to the west, Bhutan to the north, and Bangladesh to the south**.

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- It links the North-eastern Region (NER), comprising eight states—Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura—to mainland India.

Significance of Siliguri Corridor:

- It is a strategically significant and geopolitically sensitive region.
- It is vital for the **movement of military** personnel, goods, and supplies.
- Any blockade or threat to this corridor could disrupt connectivity to India's northeast.
- The region is **close to the India-China border, particularly the Chumbi Valley in Tibet**, where China has built significant military infrastructure.
- In case of conflict, China could potentially cut off India's access to its northeastern states by targeting this corridor.

WHAT IS OPERATION BRAHMA?



- It is **India's humanitarian mission** launched in response to the devastating 7.7-magnitude **earthquake that struck Myanmar** on March 28, 2025.
- The massive earthquake that **devastated Myanmar and neighbouring Thailand** killed over 1,600 people and caused widespread destruction.
- The large-scale humanitarian mission includes **rescue teams, medical aid, and relief supplies**.
- The **National Disaster Response Force (NDRF)** deployed an **80-member team** equipped with concrete cutters, drill machines, plasma cutters, and other rescue tools.
- The **Indian Army** has mobilised a **specialised medical task force** to provide urgent humanitarian assistance.

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- The Indian Army dispatched a specialized 118-member medical team from the elite Shatrugit Brigade Medical Responders.
- As part of the mission, the **Indian Army will set up a 60-bed Medical Treatment Centre** to provide immediate care to those injured in the disaster.
- The facility will be equipped to handle trauma cases, emergency surgeries, and essential medical services to support Myanmar's strained healthcare system.
- Two Indian naval ships, **INS Satpura and INS Savitri**, were dispatched carrying 40 tonnes of humanitarian aid to the port of Yangon.

CALLS FOR GST 2.0 GROW STRONGER AMIDST COMPLIANCE CHALLENGES AND REFUND DELAYS

- India's GST, introduced in 2017, was envisioned as a game-changer to **unify India's fragmented indirect tax system**.
- However, nearly eight years later, a Parliamentary report has highlighted deep-rooted issues in GST implementation that impact businesses, State finances, and the overall efficiency of the tax system.
- The **Public Accounts Committee (PAC)**, in its latest report to Parliament, has called for a **comprehensive overhaul of the GST system**, a "GST 2.0", to reduce complexity, improve transparency, and enhance ease of compliance.

Compensation to States Remains a Key Concern:

- One of the biggest concerns flagged by the PAC is the **lack of transparency and audit** in the disbursement of GST compensation to States.
- The **Comptroller and Auditor General (CAG)** has not audited the **GST Compensation Fund** for over six years, reportedly due to the **non-submission of proper financial data by the Ministry of Finance**.
- This has hampered the release of compensation amounts to several States that heavily rely on these funds, especially industrial States like **Tamil Nadu and Karnataka**, which feared revenue loss under GST.

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- Further, a review of 10,667 cases showed 2,447 inconsistencies, and around ₹32,577 crore remains pending, underscoring the urgency for better fund management and auditing mechanisms.

Compliance Complexities and Technical Glitches:

- The PAC noted that several procedural inefficiencies continue to plague GST compliance, leading to either **delayed revenue inflow to the government** or **cash flow constraints for businesses**.
- **Key issues include:**
 - Confusion over tax jurisdictions delaying refund.
 - Unjustified cancellation of GST registrations: Of 14,998 cases studied, show-cause notices were not issued in 6,353 instances, violating legal norms
 - Registration challenges: Taxpayers are not allowed to withdraw or modify applications, and in some cases, registrations were rejected without clear reasons
 - Delays in Input Tax Credit (ITC) refunds, affecting MSMEs and exporters who rely on regular cash flows
- The Ministry claimed that some processes have been automated, but the Committee expressed concern over the **lack of robust documentation** and **limited manual oversight**, questioning the effectiveness of the automated systems.

Delays in Refunds and Their Economic Impact:

- The report specifically emphasised the **inadequacy of the refund mechanism**, with businesses experiencing **long waiting periods**, affecting working capital and daily operations, especially for **Micro, Small, and Medium Enterprises (MSMEs)** and **exporters**.
- The Finance Ministry responded by promising improvements, including clearer **timelines for refund processing** and more **real-time updates on the status of refund applications**.
- The upcoming '**Antarang Portal**' is expected to centralise filing, tracking, and documentation to enhance transparency.

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CARRIAGE OF GOODS BY SEA BILL, 2024



- It will replace the colonial-era Indian Carriage of Goods by Sea Act, 1925.
 - The Act establishes the **responsibilities, liabilities, rights, and immunities** in case of **goods carried from a port in India to another port** in India or any other port in the world.
 - The Act is in conformance with the **International Convention for the Unification of Certain Rules of Law relating to Bills of Lading of August 1924 (Hague Rules)** and subsequent amendments to it.
 - The bill retains all provisions of the act.
- The **bill is aimed at consolidating laws related to port management**, promoting integrated port development, and enhancing the ease of doing business in the maritime sector.
- It seeks to optimize the utilisation of India's vast coastline by **establishing and empowering State Maritime Boards** to ensure effective management of ports other than major ports.
- It also **addresses critical aspects such as pollution control, disaster management, emergency response, security, safety, navigation** and data management at ports.
- It seeks to ensure India's compliance with international obligations and maritime conventions.
- This bill includes **provisions for port conservation** and introduces adjudicatory **mechanisms for resolving port-related disputes efficiently**.
- **Powers of the Central Government:** The Bill empowers the Central Government to:
 - **issue directions** for carrying out provisions of the Bill;
 - **amend the schedule** specifying rules applicable to bills of lading;