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ANCIENT INDIA'S MARITIME TRADE NETWORKS

Context

- Recent underwater excavations off **Poompuhar (Kaveripoompattinam) in Tamil Nadu** have strengthened evidence of the port city's participation in long-distance maritime trade.

About

- The discovery of a **West Asian torpedo-jar fragment** and **glazed pottery** associated with ancient Iran provides evidence of Poompuhar's maritime links with the Persian Gulf and West Asia.
- These findings suggest that ancient Tamilakam was integrated into wider Indian Ocean trade networks, connecting it with **West Asia, the Mediterranean and Southeast Asia**.

About Poompuhar

- Poompuhar was an important **early Chola port city** located at the **mouth of the Cauvery River**, where it meets the Bay of Bengal.
- The city was traditionally divided into **Maruvurppakkam** near the seashore, **Pattinappakkam** towards the west and **Nalangadi** between the two.
- Archaeological evidence suggests that the settlement existed at least from the **5th–4th century BCE**.
- Sangam and post-Sangam literature** describe it as a major commercial centre, attracting merchants from different parts of India and Southeast Asia.
- The port was also connected to other Indian maritime centres, such as **Tamralipti and Palur**.

Maritime Trade of Other Major Dynasties

- The Mauryan Empire** developed extensive trade networks and maintained links with ports on both the eastern and western coasts.
 - ♦ **Arthashastra** contains references to **navadhyaksha**, an official associated with waterways and shipping.
- Satavahanas**: They played an important role in the **Deccan–western coast trade**, with ports such as **Kalyan, Sopara and Bharukachcha (Bharuch)** facilitating commerce with the Roman world.
- Cheras**: The **Muziris** region on the Malabar Coast became an important centre for Roman and West Asian trade.

- ♦ **The Periplus of the Erythraean Sea and Sangam literature** provide evidence of maritime commerce involving the Chera realm.
- Pandys**: The Pandyan kingdom participated in Indian Ocean trade through ports such as **Korkai**, which was particularly associated with the **pearl fisheries of the Gulf of Mannar**.
- Western Kshatrapas**: Their control over parts of western India enabled participation in the **Arabian Sea trade**, particularly through ports in Gujarat and the western Deccan.
- Pallavas**: From the eastern coast, the Pallavas maintained maritime and cultural links with Southeast Asia, particularly regions of **present-day Cambodia** and parts of mainland Southeast Asia.

Maritime Trade as a Driver of Ancient India's Prosperity

- Economic growth**: Overseas trade generated wealth, customs revenue and expanded markets for Indian goods.
- Urbanisation**: Ports such as **Poompuhar, Muziris and Bharuch** developed into prosperous commercial centres.
- Craft production**: Foreign demand encouraged specialised production of textiles, spices, beads, ceramics and metal goods.
- State revenues**: Rulers benefited through port taxes, customs duties and regulation of trade.
- Cultural exchange**: Trade facilitated the movement of religions, art, languages, ideas and technologies across the Indian Ocean.
- Technological advances**: Maritime commerce encouraged improvements in shipbuilding, navigation and knowledge of monsoon winds.

Other ancient Indian ports

- Muziris** on the **Malabar coast** was associated with trade across the Arabian Sea and contacts with the Roman world.
- Arikamedu near Puducherry** has yielded evidence of Indo-Roman commercial connections.
- Tamralipti** in present-day West Bengal was an important eastern maritime centre.
- Bharuch in Gujarat** connected western India with the Arabian Sea trade network.

Source: IE

SUBSEA CABLES: SECURING THE BACKBONE OF THE DIGITAL ECONOMY

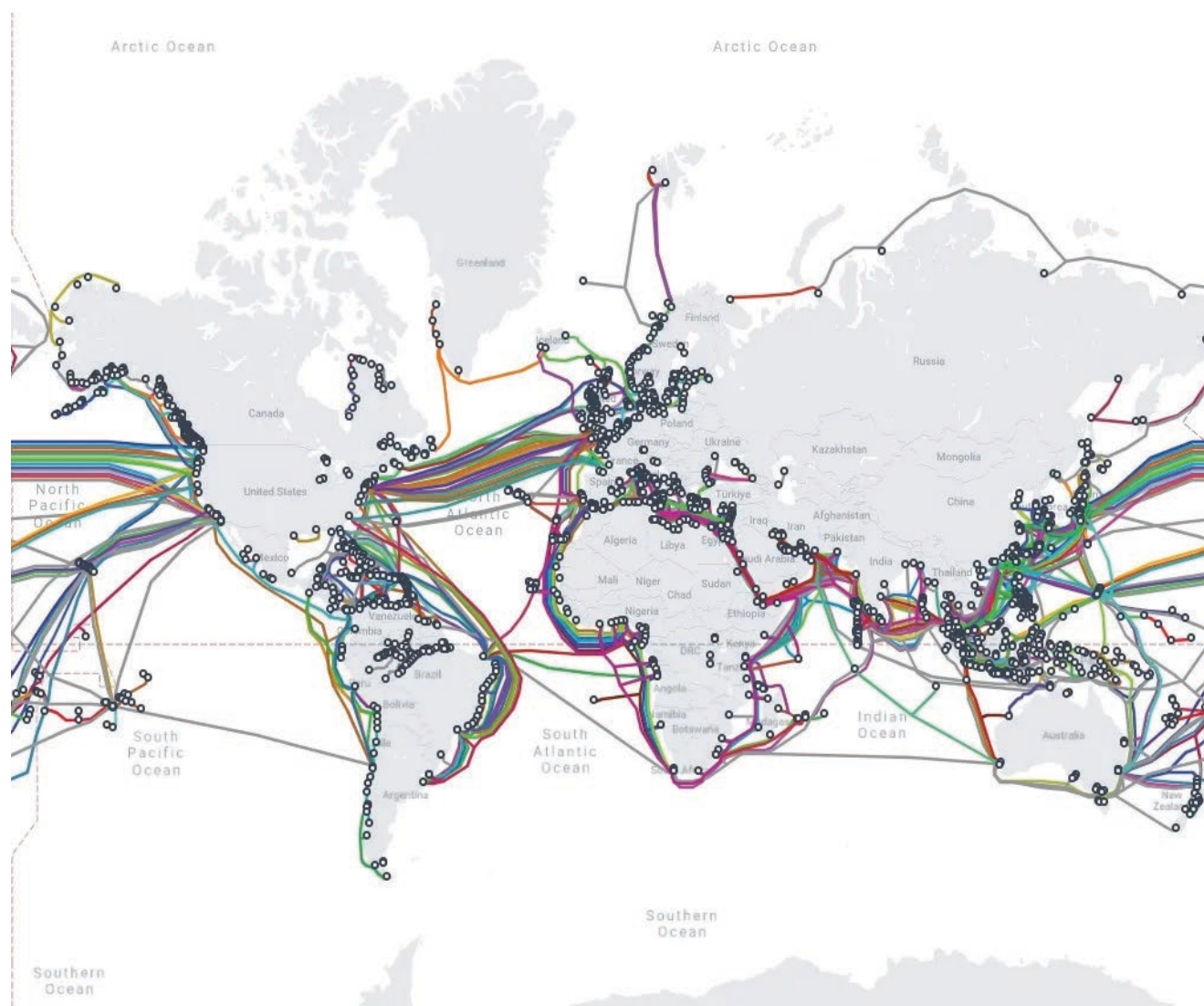
Context

- Recent suspected cable-sabotage incidents in the Arctic and Baltic have brought renewed attention to the vulnerability of submarine cables, the physical backbone of global digital connectivity.

About Subsea Cables & Their Distribution

- Subsea cables are **fibre-optic cables** laid on the ocean floor that connect countries and continents.
- They carry **more than 99% of international data traffic**, making them indispensable to the functioning of the global digital economy.

- The network has historically been built through consortiums of telecom companies, cable operators and technology firms.
- However, **hyperscalers** (large technology and cloud-service companies) are increasingly investing directly in cable systems because of rapidly rising data and AI-related bandwidth requirements.
- The supply side is also concentrated. **Alcatel Submarine Networks (France), SubCom (US) and NEC (Japan)** are the principal manufacturers and together account for a very large share of the world's deployed submarine cable infrastructure.



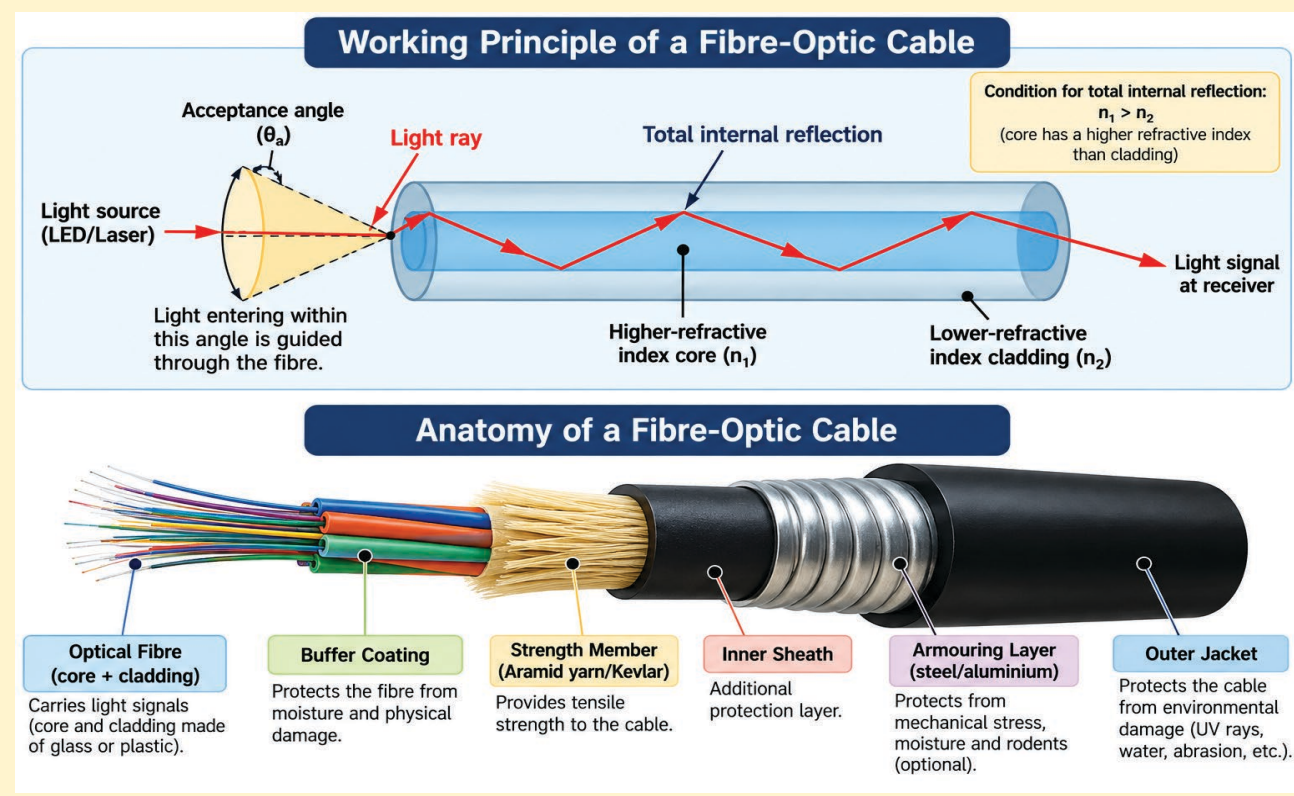
Significance of Subsea Cables

- **Backbone of the Digital Economy:** International banking, financial transactions, cloud services, e-commerce, government communication and everyday digital services depend heavily on submarine cables.

- **Strategic Infrastructure:** A damaged cable can reduce or interrupt international connectivity for an affected region, with consequences for businesses, governments and citizens.
- **Enabler of AI and Data Economy:** The expansion of cloud computing, artificial intelligence and data centres is increasing demand for high-capacity, low-latency international connections.
- **Importance for Small Island States:** For many small island and geographically isolated economies, dependence on a few cable links creates a significant **single-point-of-failure risk**.
 - ♦ Cable resilience is therefore closely linked with economic and social resilience.

Fibre-Optic Cables

- These are communication cables that carry information on **very fine strands of glass or plastic fibre**.
- The data is transformed into **light pulses** and transferred down the cable via the principle of **total internal reflection (TIR)**.
- Fibre optics can transmit data using light, allowing **very high data-transfer speeds** and a **broad bandwidth**. It makes fibre optics ideal for Internet and telephony.
- Fibre has **low attenuation** thus signals can be sent over long distances. Optical amplifiers/repeaters are used on long distances in undersea cables to boost the signal.



Why Are Subsea Cables Vulnerable?

- **Physical Damage:** Much of the cable damage is due to fishing activity, ship anchors, earthquakes, landslides and other marine action.
- **Sabotage and Hybrid Threats:** Recent incidents in the Baltic Sea and in the adjacent waters have raised worries of deliberate meddling.
 - ♦ The difficulty of attribution makes underwater infrastructure desirable for **grey zone or hybrid activities**.
- **Concentrated Repair Capacity:** Repair of an undersea cable requires specialised vessels, equipment and qualified people.
 - ♦ Limited worldwide repair capacity can extend outages following an incident.
- **Supply-Chain Concentration:** Reliance on a few manufacturers and specialised service providers represents strategic risks.

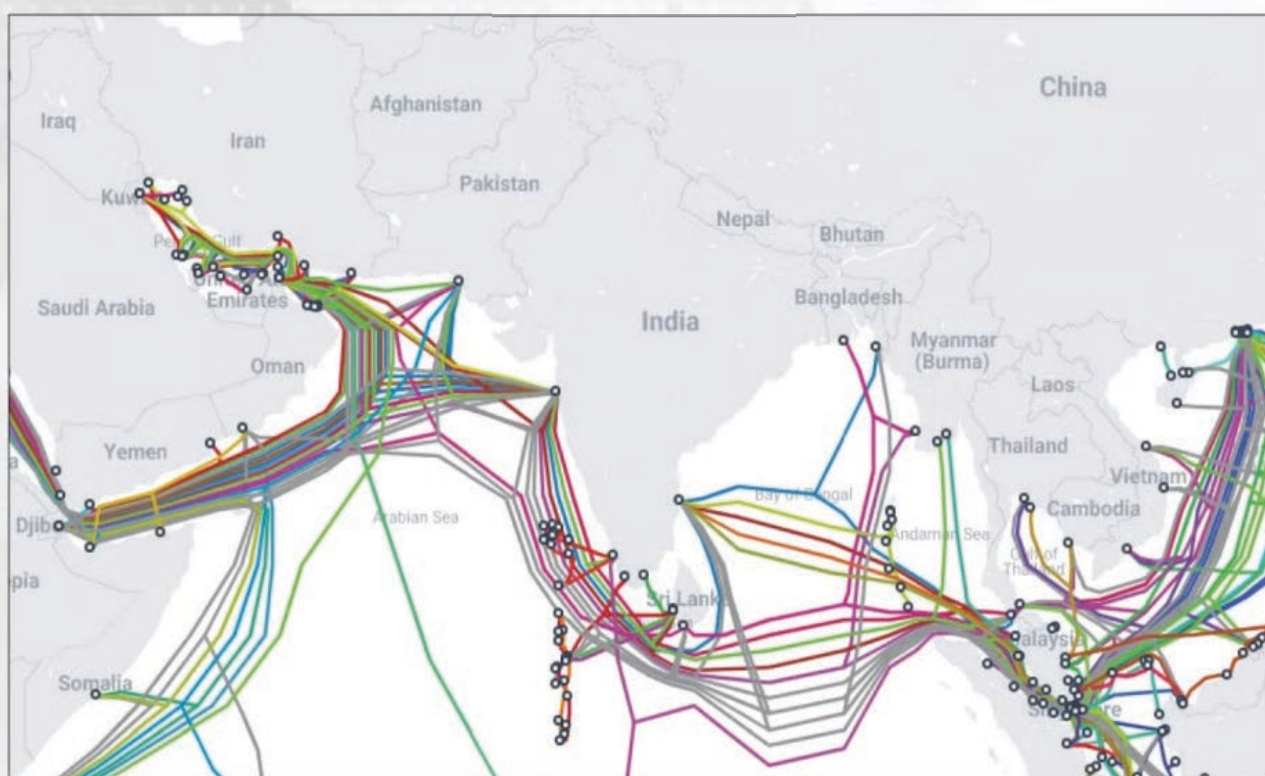
- **Digital Sovereignty:** The landing stations and the network infrastructure itself have larger consequences for **digital sovereignty and strategic autonomy** while content of cables is not automatically readable in general, whether encrypted or secured, the management of their routes.

India: Subsea Cables & Building Resilience

- India is an important node in the **Indo-Pacific submarine-cable network**, with international cables coming ashore on its west and east coastlines.
 - ♦ The **Submarine Networks** database provides details of India's cable systems and landing stations.
- India's growing digital economy makes uninterrupted international connectivity strategically important.
 - ♦ At the same time, concentration of cable landings, dependence on foreign specialised equipment and limited domestic repair capacity create vulnerabilities.
- India should therefore develop **indigenous cable repair and maintenance capabilities**.
 - ♦ Faster regulatory clearances are equally important because delays in permissions can discourage investment in specialised repair infrastructure.

INDIA A STRATEGIC LOCATION FOR SUBSEA CABLES

India's strategic location makes it a vital hub for subsea cables connecting regions like the Middle East, Southeast Asia, East Asia, and Europe, facilitating connectivity between continents. Telegeography's Submarine Cable Map depicts approximately 400 submarine cables worldwide, spanning over 1.3 million kilometres. In India, Mumbai has about 20 subsea cables landing in the city, while Chennai has nine cables.



Way Forward

- India needs a ‘**redundancy - resilience - rapid repair**’ strategy to:
 - ♦ diversify cable routes and landing locations;
 - ♦ strengthen domestic repair vessels and skilled manpower;
 - ♦ establish a coordinated national mechanism for cable monitoring and incident response;
 - ♦ improve cooperation among the **Navy, Coast Guard, telecom authorities and private operators**;
 - ♦ promote public-private investment in cable infrastructure; and
 - ♦ deepen cooperation with Indian Ocean and Indo-Pacific partners.

Source: IE

ARMED FORCES (SPECIAL POWERS) ACT, 1958

Context

- The Centre has extended the **Armed Forces (Special Powers) Act, 1958**, in specified areas of **Nagaland, Manipur and Arunachal** for another six months.

What is AFSPA?

- The **Armed Forces (Special Powers) Act, 1958** empowers the armed forces to operate in areas declared as “disturbed areas”.
- It grants **special powers to security forces** to maintain public order and combat insurgency.
- **Major Provisions:**
 - ♦ The **Governor of a State**, the Administrator of a Union Territory, or the Central Government may declare an area as a “**disturbed area**”.
 - ♦ **It grants special powers to armed forces**, including use of force (even causing death under specified conditions), arrest without warrant, search without warrant, and destruction of arms dumps or militant hideouts.
 - ♦ **No prosecution, suit, or legal proceeding** can be initiated against armed forces personnel for actions taken under AFSPA without prior approval of the Central Government.
- AFSPA is currently enforced in parts of **Manipur, Nagaland, Arunachal Pradesh, and Assam**, alongside the **Union Territory of Jammu and Kashmir**.

Why has there been Insurgency in the North Eastern Region of India?

- **Historical Factors:** The region has a history of being distinct from the rest of India, both culturally and geographically and many indigenous communities have historically maintained a certain level of autonomy.
 - ♦ The integration of the region into the Indian state led to challenges in addressing local aspirations.
- **Economic Marginalization:** Some insurgent groups in the northeast have cited economic marginalization as a key grievance.
- **Borders and Connectivity:** The region shares international borders with countries like Myanmar, Bhutan, Bangladesh, and China. This has contributed to issues related to cross-border movements, smuggling, and the presence of insurgent groups operating from neighboring countries.
- **Political Alienation:** The sense of being politically marginalized and not adequately represented in decision-making processes has led to discontent.
- **Migration and Demographic Changes:** Migration patterns, including the influx of people from other regions leading to demographic changes and creating tensions over issues related to land, resources, and cultural identity.
- **Government Responses:** The counter-insurgency operations, has at times led to human rights concerns and further fueled grievances among local populations.

Arguments in Favour of AFSPA

- **Operational flexibility:** AFSPA provides security forces with special powers in areas declared “disturbed”, enabling them to respond quickly to armed insurgency and serious security threats.
- **Protection of personnel:** It provides a legal framework for security personnel operating in difficult counter-insurgency environments.
- **Prevention of escalation:** Powers such as arrest without warrant and search enable security forces to act promptly against suspected insurgents and prevent escalations.
- **Difficult operational environment:** In conflict-affected areas, conventional policing mechanisms may face limitations, therefore, AFSPA enables the armed forces to support civil authorities.
- **Temporary security measure:** The Act is linked to the declaration of an area as “disturbed”; therefore, its continuation can be reassessed when the security situation improves.

Arguments Against

- **Concerns over human rights:** Critics argue that the Act's wide operational powers can increase the risk of excessive or disproportionate use of force and violations of fundamental rights.
- **Limited accountability:** Section 7 requires prior sanction of the Central Government for prosecution of personnel for acts done under the Act, which critics argue can make legal accountability difficult.
- **Alienation of local population:** Prolonged deployment can create mistrust between local communities and security forces, potentially undermining counter-insurgency efforts.
- **Possibility of misuse:** Broad powers of search, arrest and use of force may be misused if adequate operational oversight and safeguards are not maintained.
- **Impact on federalism:** Law and order is primarily a State subject under the Seventh Schedule, continued use of AFSPA at times raise concerns about the balance between Union and State powers.

Major Committees' Recommendations on AFSPA

- **Justice B.P. Jeevan Reddy Committee (2005):** Recommended the repeal of AFSPA and incorporation of its essential provisions into the **Unlawful Activities (Prevention) Act (UAPA), 1967**, along with stronger grievance redressal and accountability mechanisms.
- **Santosh Hegde Commission (2013):** It highlighted misuse of AFSPA provisions, and recommended greater accountability and periodic review of the Act.
- **Second Administrative Reforms Commission (2007):** Recommended repeal of AFSPA, arguing that it had become a symbol of discrimination and alienation in affected regions.

Source: AIR

NUCLEAR WASTE MANAGEMENT IN INDIA

Context

- India's expanding nuclear programme and the entry of private players into nuclear power have brought renewed attention to the long-term financial and institutional responsibilities for radioactive waste management.

About

- In a conventional **once-through fuel cycle**, used nuclear fuel is treated as waste and ultimately destined for permanent disposal.
- India follows a **closed fuel cycle**, under which spent fuel is reprocessed to recover uranium and plutonium for further use.
- Therefore, India considers spent fuel not merely as waste but also as a **potential resource for recovering reusable nuclear material**.
 - ♦ Reprocessing can significantly **reduce the volume** of high-level waste requiring geological disposal, **but it does not make radioactivity disappear**.

Management of Nuclear Fuel

- **Cooling and interim storage:** Freshly discharged fuel remains highly radioactive and generates considerable heat, requiring storage in cooling pools and subsequently in other storage systems.
- **Reprocessing:** Spent fuel can be chemically processed to recover reusable uranium and plutonium.
- **Waste conditioning:** Radioactive residues that cannot be reused are converted into stable forms, such as vitrified waste, for long-term storage.
- **Final disposal:** Long-lived high-level radioactive waste eventually requires isolation from the environment, generally through a deep geological repository.

Geological Repository

- A **deep geological repository** is designed to **isolate long-lived radioactive waste deep underground** using suitable geological formations and multiple containment barriers.
- Such a facility is different from an interim storage facility because its purpose is **long-term isolation** rather than temporary storage.
- **India has been examining** the need for geological disposal.

Need for Long-Term Waste Management

- **Intergenerational Responsibility:** Radioactive waste can remain hazardous for extremely long periods, making its management fundamentally different from ordinary industrial waste
- **Financial Uncertainty:** Nuclear-waste management and geological disposal involve costs that **may arise decades** after a reactor begins operation.

- ♦ Without dedicated financial provisions, the eventual burden could disproportionately fall on the government and taxpayers.
- **Institutional Continuity:** Nuclear plants have operational lifetimes of several decades, whereas radioactive-waste management can continue for much longer.
 - ♦ The responsibility therefore needs to remain institutionally defined even when an operator changes ownership, exits the sector or shuts down a plant.
- **Adequate financial provisions** are required to meet waste management and disposal costs that may arise decades after a nuclear power plant has ceased operation.

Way Ahead

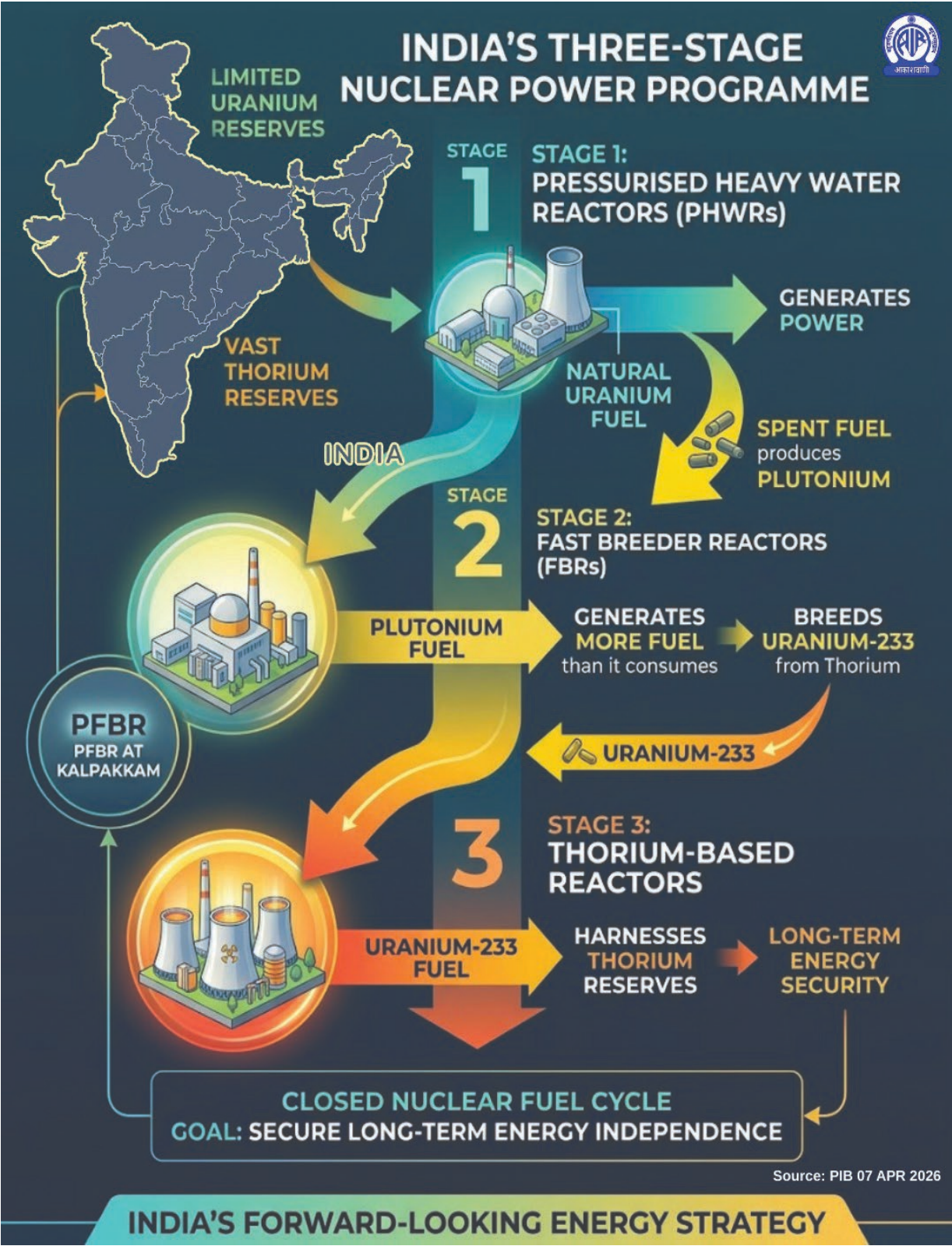
What are the Concerns?

- India's nuclear sector is **opening to greater private participation**, creating a need to clearly define responsibilities across the entire nuclear fuel cycle.
- **Public Acceptance: People may resist** hosting radioactive-waste facilities because of concerns over health, environmental safety and long-term land use.
- **There are concerns over institutional mechanisms** capable of ensuring continuous monitoring, regulatory oversight and safety standards over the long timeframes associated with radioactive waste.
- **Create a Dedicated Nuclear Waste Fund:** A ring-fenced waste-management fund can be created through a levy linked to nuclear electricity generation.
 - ♦ Contributions can accumulate throughout the operating life of a nuclear plant and finance future storage, transportation, decommissioning and disposal activities.
- **Nuclear regulations** should clearly **specify the financial and operational responsibilities** of private operators for spent fuel and radioactive waste.
- **Early Repository Planning:** India need not immediately construct a geological repository, but it should begin systematic site identification, geological assessment and public consultation well in advance.
- **Polluter-Pays Principle:** The costs associated with radioactive waste should be internalised into the economics of nuclear power rather than being transferred entirely to future taxpayers.

India's Three-stage nuclear programme

- **Establishment:** India established the **Atomic Energy Commission in 1948**.
 - ♦ **In 1956**, Asia's first research reactor, **Apsara**, was commissioned at the Bhabha Atomic Research Centre (BARC) in Trombay.
 - ♦ **India was the second Asian nation** to build a nuclear power plant in **1969** at Tarapur, just after Japan and long before China.
- India has a three-phase programme of nuclear power visioned by **Dr Homi J Bhabha**, the father of India's nuclear programme.
- **First Stage (Pressurized Heavy Water Reactors - PHWRs):** India's nuclear program initially focused on establishing a fleet of PHWRs.
 - ♦ These reactors use natural uranium (**U-238**), which contains minuscule amounts of **U-235**, as the fissile material.
 - ♦ Heavy water (deuterium oxide) **as both moderator and coolant**.
 - ♦ The primary purpose of this stage was to **produce plutonium-239 as a byproduct from the uranium fuel**.
 - ♦ **Plutonium-239 is a fissile material** used as fuel in nuclear reactors.
- **Second Stage (Fast Breeder Reactors - FBRs):** The second stage of the program involves the **deployment of Fast Breeder Reactors (FBRs)**.
 - ♦ FBRs are designed to produce **more fissile material than they consume** by utilizing a fast neutron spectrum.
 - ♦ In this stage, **plutonium-239** produced in the first stage is used as fuel along with **U-238** to produce energy, **U-233, and more Pu-239**.
 - ♦ **Uranium-233 is another fissile material** that can be used as fuel in nuclear reactors.

- **Third Stage (Advanced Heavy Water Reactors - AHWRs):** The final stage of the program entails the deployment of Advanced Heavy Water Reactors (AHWRs).
 - ♦ Pu-239 will be combined with thorium-232 (Th-232) in reactors to produce energy and U-233.
 - ♦ Thorium is abundantly available in India, and this stage aims to harness its potential as a nuclear fuel.



Source: IE

NEWS IN SHORT

ATTORNEY GENERAL OF INDIA

Context

- A Supreme Court advocate sought **statutory consent of the Attorney General of India** to initiate **criminal contempt** action against the Chief Election Commissioner (CEC).
- ♦ **The prior consent of the Attorney General of India is mandatory** when a private individual or a third party files a criminal contempt petition in the Supreme Court under Section 15 of the Contempt of Courts Act, 1971.

Attorney General of India

- **Article 76** of the Constitution provides for the **office of the Attorney General of India**.
- **The President** shall appoint a person who is **qualified to be appointed a Judge of the Supreme Court to be Attorney-General for India**.
- The Attorney General of India (AGI) is the **highest law officer** of the Union Government and **serves as its principal legal adviser**.
- **Qualifications:** A person must be a citizen of India; and have been a judge of a High Court for at least 5 years, or an advocate of a High Court for at least 10 years, or be a distinguished jurist in the President's opinion.
- **Functions and Duties:**
 - ♦ Gives legal advice to the Government of India on matters referred to him/her.
 - ♦ Performs other legal duties assigned by the President.
 - ♦ Represents the Union Government before the Supreme Court and High Courts.
 - ♦ Can appear in all courts in India.
 - ♦ Advises the government on constitutional and other legal matters.
- **Rights and Privileges:**
 - ♦ Has the right to speak and take part in the proceedings of both Houses of Parliament, their joint sittings and parliamentary committees of which he/she may be named a member.
 - ♦ Does not have the right to vote in Parliament.
 - ♦ Enjoys the privileges and immunities available to a Member of Parliament.

Tenure and Removal:

- ♦ The Constitution does not prescribe a fixed tenure.
- ♦ The Attorney General holds office during the pleasure of the President.
- ♦ The Constitution does not prescribe a specific procedure for removal.

Source: TH

QUAD-AT-SEA SHIP OBSERVER MISSION

In News

- Indian Coast Guard (ICG) ship **Shaunak** sailed from Chennai for Perth, Australia, as part of the **QUAD-at-Sea Ship Observer Mission**.

QUAD-at-Sea Ship Observer Mission

- The Quad nations launched the inaugural '**Quad-at-Sea Ship Observer Mission**'.
- It is aimed at enhancing **maritime interoperability and professional exchanges** among India, Australia, Japan and the United States.
 - ♦ Six officers, designated as 'Sea Riders', have embarked onboard Shaunak for the mission.
- It is aligned with the QUAD Foreign Ministers' Joint Statement which reiterated the grouping's commitment to a free, open, inclusive and rules-based maritime order in the Indo-Pacific.

Importance

- It reflects India's MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions) vision and the ICG's emphasis on collective engagement and cooperation with partner maritime forces to contribute to a secure maritime environment across the Indo-Pacific.

Know about QUAD

- **Origin:** The QUAD emerged from humanitarian cooperation after the 2004 Indian Ocean tsunami. Japan proposed the framework in 2007, but it became inactive after Australia stepped back in 2008. It was revived in 2017 amid growing Indo-Pacific strategic concerns.
- **Focus:** Regional security, economic cooperation, maritime safety, infrastructure, and supply-chain resilience. It is not a formal military alliance.
- **Vision:** The 2021 QUAD Leaders' Summit adopted the "Spirit of the Quad", supporting a free, open and inclusive Indo-Pacific, based on democratic values, rule of law and freedom from coercion.

- **Key Initiatives:**
 - ♦ **QUAD At Sea Ship Observer Mission:** Launched under the 2024 Wilmington Declaration to strengthen maritime domain awareness, interoperability and operational coordination.
 - ♦ **Malabar Exercise:** Multilateral naval exercise involving all four QUAD countries, aimed at improving maritime coordination, interoperability and readiness.
- **Quad Plus:** Engagements have included countries such as South Korea, New Zealand and Vietnam, indicating scope for wider cooperation.

Source : TH

BILATERAL INVESTMENT TREATY (BIT)

In News

- The Ministry of Finance has completed the **review of India’s 2016 Model Bilateral Investment Treaty (BIT)** and sent the revised framework for Cabinet Secretariat approval.

Bilateral Investment Treaty (BIT)

- It is essentially an agreement between two countries to protect **investments made by investors** of one country in the other.
- It provides **foreign investors with certain legal safeguards** against adverse government action and, in specified circumstances, allows them to seek international arbitration if a dispute cannot be resolved through domestic legal remedies.
- The **current framework (2016 Model)** requires a foreign investor to wait for five years before initiating a treaty-based arbitration against India.

Why the 2016 Model Needed Revision?

- **Too much litigation before arbitration:** For example, a foreign company facing a tax dispute would need to spend years in Indian courts first, which most global investors find impractical and risky.
- **Narrow definition of “investment”:** The 2016 model defines investment narrowly, covering mainly enterprises with real assets and risk, and leaving out things like portfolio investment or loans. This means many forms of foreign capital simply don’t get treaty protection at all.

- **Weak Most Favoured Nation (MFN) clause:** The model restricts investors from claiming better treatment that India may have given to another country under a different treaty. This makes India’s offer look less generous compared to other countries’ BITs.

Source :IE

GUIDELINES FOR DESIGN OF ACCESS-CONTROLLED HIGH-SPEED NATIONAL HIGHWAYS

In News

- The National Highways Authority of India (NHAI) has introduced **comprehensive guidelines** for the planning and design of access-controlled high-speed **National Highways, other than Expressways.**

About guidelines

- The guidelines aim to bring uniformity in the preparation of Detailed Project Reports (DPRs), ensure consistency in technical standards, strengthen road safety and improve operational efficiency across the National Highway network.
- It will apply to all upcoming four- and six-lane **Greenfield and Brownfield high-speed access-controlled National Highways.**
- It is part of the Government’s long-term vision of developing a world-class National Highway network **under Viksit Bharat 2047.**

NEW DESIGN GUIDELINES

15,000 PCU (passenger car unit) Corridor should be developed as a 4-lane highway with 4-lane structure	15,000-25,000 PCU, Corridor should be developed as a 4-lane highway and 6-lane structures	25,000-40,000 PCU, Corridor should be developed as a 6-lane highway with 6-lane structures
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- Interchanges with ramps will be provided at crossings with Expressways, National Highways, State Highways and important arterial roads generating substantial traffic.
 - ♦ Such interchanges will also be provided to facilitate connectivity with major traffic-generating destinations, including ports,

airports, Multi-Modal Logistics Parks (MMLPs), industrial areas and major tourist destinations.

- The guidelines prescribe the construction of a one-metre-high boundary wall along the outer edge of the corridor to strengthen access control and prevent encroachments, unauthorised entry and the movement of stray cattle onto high-speed corridors,

Importance

- The comprehensive guidelines represent a significant step towards standardising the planning and design of fully access-controlled National Highways.
- The new guidelines provide a uniform set of technical and safety provisions for such corridors.

Source :DD

GI-TAGGED GULBARGA TUR DAL

Context

- The Agricultural and Processed Food Products Export Development Authority (APEDA) facilitated the flag-off of a one MT consignment of GI-tagged Gulbarga Tur Dal from Karnataka to the Maldives.

About

- Gulbarga Tur Dal, also known as Kalaburagi Togari Bele, is a variety of pigeon pea, commonly known as Arhar Dal or Toor Dal, cultivated in the Kalaburagi region of Karnataka.
- Karnataka is the **largest tur dal-producing state** in India, contributing over **40 percent** of national output, with Kalaburagi district alone producing the majority of the state's yield.
- Gulbarga Tur Dal received **Geographical Indication (GI) registration in 2019** and is recognised for its distinctive taste and quality.

Cultivation of Tur Dal

- Tur dal thrives in **tropical and semi-arid regions**, with an annual rainfall of around **600–650 mm** and temperatures of **26°C–30°C** during the **rainy season**.
- It grows well in **black cotton soils** because these soils retain moisture, which benefits the crop during dry spells. It can also thrive in **loamy and well-drained alluvial soils**.

Source: AIR

KERALAM'S REVISED ECOLOGICALLY SENSITIVE AREA PROPOSAL

Context

- Kerala has urged the Centre to reduce the proposed Ecologically Sensitive Area (ESA) in its Western Ghats region from **9,993.7 sq km to 8,590.69 sq km**, restricting it to forest areas and excluding populated areas, agricultural land and plantations.

Background

- The **2013 Kasturirangan Committee** report had proposed declaring **13,108 sq km** covering **123 villages in Kerala as ESA**.
- Following protests and concerns over livelihood impacts, the **Oommen V. Oommen Committee** recommended reducing the area to **9,993.7 sq km**.
 - ♦ Of this, **9,107 sq km** was forest land and **886.7 sq km** was non-forest area.
- Kerala is now seeking to exclude the 886.7 sq km of non-forest area, limiting the ESA to **8,590.69 sq km and 98 villages**.
- The issue reflects the broader challenge of **balancing Western Ghats conservation with livelihood and development concerns** in densely populated regions.

Eco-Sensitive Areas (ESAs)

- ESAs are areas around protected areas such as national parks and wildlife sanctuaries that act as buffer zones, helping reduce the impact of human activities on biodiversity.
- They are governed under the Environment (Protection) Act, 1986 and were outlined in the National Wildlife Action Plan (2002–2016) of the MoEFCC.
- The **Gadgil Committee and Kasturirangan Committee** recommended identifying ecologically fragile areas, particularly in the Western Ghats, for stronger conservation.

Activities in ESAs

- **Prohibited:** Commercial mining, polluting industries, large hydroelectric projects, sawmills, commercial use of wood.
- **Regulated:** Tree felling, construction of hotels/resorts, commercial use of water, electrical cables, changes in agricultural practices.
- **Permitted:** Organic farming, rainwater harvesting, renewable energy, existing agricultural practices.

Kasturirangan committee report

- The High-Level Working Group (HLWG) chaired by **Dr. K. Kasturirangan** was constituted in **2012** to examine the recommendations of the **Gadgil Committee** on the conservation of the Western Ghats.
- The committee recommended designating **37%** of the Western Ghats, covering approximately **59,940 sq. km**, as an **Ecologically Sensitive Area (ESA)**. It focused more on development balance and economic activities.
 - ♦ It emphasised regulating development in identified sensitive areas while allowing more flexibility in other regions.
 - ♦ It recognised the importance of sustainable livelihoods, but with less emphasis on forest rights.
- It argued for **strengthening the existing framework** of environmental clearances and setting up of a **state-of-the-art monitoring agency**.

Source: IE

COFFEE BOARD MOVES TOWARDS SUSTAINABILITY CERTIFICATION FOR COFFEE

Context

- The **Coffee Board of India** has developed sustainability standards and is in the process of implementing a **certification process** for Indian coffee.

About

- India, the **world's seventh-largest coffee** producer and fifth-largest exporter, exported coffee worth more than \$2 billion in 2025-26, with nearly 39% comprising value-added products.
- Indian coffee's **distinctive advantage** lies in its **traditional shade-grown cultivation**, which the Board aims to leverage through the new sustainability standards.
- The certification will be done at **three levels** - first will be done by the Board based on self certification by the growers. The second level will involve independent third-party verification, while the third level will benchmark Indian standards against internationally recognised sustainability frameworks.

Coffee Production

- **Brazil** is the world's largest coffee producer, contributing about **40% of global production**, followed by **Vietnam**.

- India primarily produces two main varieties of coffee: **Arabica and Robusta**.
- **Karnataka** leads coffee production in India, followed by **Kerala and Tamil Nadu**.

Climatic Conditions

- Coffee plants require a **hot and humid climate**, with temperatures ranging between **15°C and 28°C** and annual rainfall of **150–250 cm**.

Coffee Board of India

- It is a **statutory organization** constituted under **Section (4) of the Coffee Act, 1942** and functions under the administrative control of the **Ministry of Commerce and Industry**.
- The Board comprises **33 members**, including the Chairman and the Secretary & Chief Executive Officer.
- The Board mainly focuses on research, extension, development, market intelligence, domestic and external promotion, and welfare measures.

Source: TH

BIO-BASED BIODEGRADABLE PLASTIC UNDER BIOE3

Context

- The Union Government has formally launched the commercial use of bio-based biodegradable plastic based on Polylactic Acid (PLA), developed by Balrampur Chini Mills Limited (BCML) under the BioE3 framework.

What is PLA?

- **Polylactic Acid (PLA)** is a **bio-based polymer** produced from renewable biological feedstocks, such as sugar-derived materials.
- In the PLA pathway, **sugars can be fermented to produce lactic acid**, which is then converted into PLA.
- PLA can be used to **manufacture packaging materials, films, containers and other plastic products**, depending on the grade and formulation.

BioE3 Framework

- BioE3 stands for **Biotechnology for Economy, Environment and Employment**.
- It seeks to **promote high-performance biomanufacturing** and the transition of biotechnology from laboratory research to commercially viable products.

- **The framework focuses on areas such as:**

- ♦ Bio-based chemicals and enzymes,
- ♦ Functional foods and Smart proteins,
- ♦ Precision biotherapeutics,
- ♦ Climate resilient agriculture,
- ♦ Carbon capture and its utilization,
- ♦ Futuristic marine and space research.

Source: PIB

COOL LEADERS AWARD

Context

- The inaugural Cool Leaders Award was launched in **September 2026**, during the **Global Cooling Pledge Assembly held in Singapore**.

About

- The “**Cool Leaders**” award is a global recognition initiative launched by the **UNEP Cool Coalition**.
- It recognises outstanding leadership in advancing sustainable cooling and protecting people from extreme heat. **The first Cool Leaders are:**
 - ♦ **Singapore**, for leadership in passive cooling and heat resilience.
 - ♦ **The United Arab Emirates**, for leadership in district cooling and advancing cooling in global climate and development policy.
 - ♦ **Dong Mingzhu, Chairwoman of Gree Electric Appliances**, for spearheading the development of ultra-efficient, low-carbon cooling technologies, including the Zero Carbon Source air-conditioning system.
- **The UNEP Cool Coalition** is a global platform driving system-level change on **sustainable cooling**.
 - ♦ It was launched in **2019** as a flagship initiative of the UN Secretary-General’s Climate Action Summit.

- ♦ It brings together over 250 actors to deliver efficient, climate-friendly cooling solutions aligned with the **Paris Agreement, the Kigali Amendment, and the 2030 Agenda**.

About the United Nations Environment Programme (UNEP)

- The UN Environment Programme is the **leading global voice on the environment, founded in 1972**.
- It provides leadership and encourages partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.
- **UNEP hosts the United Nations Environment Assembly**, the world’s highest-level decision-making body on the environment, with a universal **membership of all 193 United Nations’ Member States**.

About the Global Cooling Pledge

- It was launched at **COP28 in 2023** and is the **world’s first collective global commitment** to reduce the climate impact of cooling while expanding access to sustainable cooling.
- It aims to:
 - ♦ reduce cooling-related emissions by at least 68% below 2022 levels by 2050,
 - ♦ significantly increase access to sustainable cooling by 2030,
 - ♦ and collectively increase the global average efficiency rating of new air-conditioning equipment sold by 50% by 2030 from the global 2022 installed baseline.

Source: UNEP

