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Daily PIB Summary

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1.INDIA NOTIFIES STANDARDS FOR GREEN AMMONIA AND GREEN METHANOL TO BOOST GREEN HYDROGEN ECONOMY

- India has introduced **official standards defining Green Ammonia and Green Methanol**, which are key derivatives of **Green Hydrogen**.
- These standards provide clarity on **production methods, emission thresholds, and certification mechanisms**.
- Green Ammonia and Green Methanol are emerging as **transportable carriers of hydrogen and low-carbon fuels**, making them crucial for global hydrogen trade.
- The standards are expected to promote **investment, technological innovation, and international trade in green fuels**.
- For India, this step strengthens its ambition to become a **global hub for production and export of green hydrogen and its derivatives**.
- The initiative also supports India's **energy transition, decarbonisation of industries, and commitments to climate goals**.

BACKGROUND / CONTEXT

Green Hydrogen

Green Hydrogen is hydrogen produced through **electrolysis of water using renewable energy sources such as solar or wind power**.

Unlike conventional hydrogen production methods, it **does not emit carbon dioxide**, making it an important clean fuel for the future.

Applications include:

- **Steel and cement industries**
- **Refining and fertiliser sectors**
- **Shipping and aviation fuels**
- **Energy storage and power generation**

Green Ammonia

Green Ammonia is produced using **green hydrogen combined with nitrogen from the air**.

Key features:

- Acts as an **efficient carrier of hydrogen for long-distance transport**
- Used in **fertiliser production**
- Emerging as a **clean fuel for shipping and power generation**

Green Methanol

Green Methanol is produced using **green hydrogen and captured carbon dioxide**.

Key uses include:

- **Low-carbon marine fuel**

- **Chemical feedstock for industrial production**
- **Alternative fuel for transportation**

National Green Hydrogen Mission

The National Green Hydrogen Mission was launched by the Government of India in **2023** to develop a **global green hydrogen hub**.

Major objectives include:

- Achieving **large-scale production of green hydrogen**
- Reducing dependence on **fossil fuel imports**
- Promoting **export of green hydrogen and derivatives**
- Supporting **decarbonisation of hard-to-abate sectors**

KEY HIGHLIGHTS

- **Standardization Framework:** The government has defined clear **technical standards for Green Ammonia and Green Methanol production**.
- **Hydrogen Derivatives:** These fuels act as **transportable carriers of green hydrogen**, enabling global trade.
- **Investment Boost:** Standards provide **regulatory clarity for industries and investors**.
- **Energy Transition:** Supports India's shift toward **clean and renewable energy systems**.
- **Export Potential:** Strengthens India's position as a **future exporter of green fuels**.
- **Industrial Decarbonisation:** Key sectors such as **fertilisers, shipping, and heavy industry** can adopt these fuels.
- **Global Market Integration:** Aligns India's hydrogen ecosystem with **international sustainability standards**.
- **Climate Commitments:** Contributes to India's goal of achieving **net-zero emissions by 2070**.

PRELIMS BOOSTER BOX

I. **Green Hydrogen:**
   A. Produced using **renewable energy-powered electrolysis**.
   B. Considered a **zero-carbon fuel**.

II. **National Green Hydrogen Mission (2023):**
   A. Budget allocation: **₹19,744 crore (approx.)**.
   B. Target: Establish India as a **global hub for green hydrogen production and export**.

III. **Hydrogen Colour Codes:**
   A. **Green Hydrogen:** Renewable energy-based production.
   B. **Blue Hydrogen:** Produced from natural gas with carbon capture.
   C. **Grey Hydrogen:** Produced from fossil fuels without carbon capture.

IV. **Green Ammonia:**
   A. Produced using **green hydrogen and nitrogen**.
   B. Used in **fertilisers and potential marine fuel**.

V. **Green Methanol:**
   A. Produced using **green hydrogen and captured CO_2**.

B. Used as **clean fuel and chemical feedstock**.

VI. **Hydrogen as Energy Carrier:**

A. Can be **stored, transported, and converted into other fuels**.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Green hydrogen is produced through electrolysis of water using renewable energy sources.
2. Green ammonia is produced using green hydrogen and nitrogen from the air.
3. Green methanol is produced using green hydrogen and captured carbon dioxide.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (d)

2.CSIR-NIScPR CELEBRATES INTERNATIONAL WOMEN'S DAY 2026 WITH FOCUS ON WOMEN'S LEADERSHIP, INNOVATION AND WELL-BEING

- The **International Women's Day 2026 celebration** organised by CSIR-NIScPR emphasized the importance of **women's leadership and participation in science, innovation, and policy-making**.
- The event showcased **success stories of women leaders, researchers, and professionals** who have contributed to scientific advancement and societal development.
- It also highlighted the need to create **supportive institutional ecosystems that encourage women's participation in STEM fields**.
- Discussions focused on **work-life balance, mental well-being, leadership skills, and inclusive workplaces**.
- Such initiatives aim to strengthen **gender equality in science and innovation ecosystems**, contributing to broader national goals of **inclusive development and knowledge-based growth**.

BACKGROUND / CONTEXT

International Women's Day

International Women's Day is observed **annually on 8 March** to celebrate women's achievements and promote **gender equality and women's rights** worldwide.

The day highlights issues such as:

- **Gender equality**
- **Women's leadership**
- **Economic empowerment**
- **Participation in science and technology**

The celebration aligns with global commitments under the **United Nations Sustainable Development Goals**, particularly **SDG 5 – Gender Equality**.

CSIR and Its Role in Scientific Research

Council of Scientific and Industrial Research (CSIR) is one of India's **largest research and development organizations**.

Key features:

- Established in **1942**
- Network of **multiple national laboratories and research institutes**
- Conducts research in **science, technology, engineering, and industrial innovation**

The CSIR-National Institute of Science Communication and Policy Research focuses on **science communication, science policy studies, and research dissemination**.

Women in STEM in India

Women's participation in **Science, Technology, Engineering, and Mathematics (STEM)** has been increasing but still faces challenges such as:

- **Gender stereotypes**
- **Limited leadership representation**
- **Work-life balance constraints**

Government initiatives promoting women in STEM include:

- Women Scientist Scheme
- GATI Programme

KEY HIGHLIGHTS

- **Women Leadership:** The event highlighted the role of women leaders in **science, policy, and innovation ecosystems**.
- **Innovation Focus:** Showcased contributions of women scientists and researchers in **scientific discovery and technological development**.
- **Science Communication:** Promoted the importance of **effective communication of scientific knowledge to society**.
- **Well-being and Work-Life Balance:** Discussions addressed **mental health, workplace inclusivity, and professional development**.
- **Encouraging STEM Participation:** Emphasized the need to increase **women's participation in STEM careers and leadership roles**.
- **Institutional Support:** Highlighted policies for **gender-sensitive research institutions and workplaces**.
- **Knowledge Sharing:** Provided a platform for **mentorship, inspiration,**

and professional networking among women researchers.

PRELIMS BOOSTER BOX

I. **International Women's Day:**
   A. Observed annually on **8 March**.
II. **Council of Scientific and Industrial Research (CSIR):**
   A. Established in **1942**.
   B. One of India's **largest publicly funded R&D organizations**.
III. **CSIR-NIScPR:**
   A. Focuses on **science communication and policy research**.
IV. **Women Scientist Scheme:**
   A. Supports **women scientists who want to return to research after career breaks**.
V. **GATI Programme:**
   A. Full form: **Gender Advancement for Transforming Institutions**.
   B. Promotes **gender equity in STEM institutions**.
VI. **Relevant Sustainable Development Goal:**
   A. **SDG 5 – Gender Equality**
VII. **STEM:**
   A. Stands for **Science, Technology, Engineering, and Mathematics**.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. International Women's Day is observed annually on 8 March to promote gender equality and celebrate women's achievements.
2. The Council of Scientific and Industrial Research (CSIR) is India's premier organization for research in science and industrial development.
3. The GATI programme aims to promote gender equity in STEM institutions in India.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (d)

3.PRADHAN MANTRI BHARTIYA JANAUSHADHI PARIYOJANA (PMBJP)

- The **Pradhan Mantri Bhartiya Janaushadhi Pariyojana (PMBJP)** is a flagship initiative of the Government of India that promotes the **use of quality generic medicines at affordable prices**.
- Under the scheme, dedicated outlets known as **Jan Aushadhi Kendras** sell

unbranded generic medicines at significantly lower prices compared to branded medicines.

- The scheme seeks to **reduce healthcare costs for citizens**, especially for economically weaker sections who often spend a large share of their income on medicines.
- By expanding the network of pharmacies and improving supply chains, the programme aims to ensure **wider availability of essential medicines across urban and rural areas**.
- The initiative also supports **domestic pharmaceutical manufacturing and rational use of medicines**, strengthening India's public health system.

BACKGROUND / CONTEXT

Pradhan Mantri Bhartiya Janaushadhi Pariyojana

Pradhan Mantri Bhartiya Janaushadhi Pariyojana was launched to **promote the use of generic medicines and make healthcare more affordable**.

The scheme is implemented by the Pharmaceuticals and Medical Devices Bureau of India under the Department of Pharmaceuticals.

Key components:

- Establishment of **Jan Aushadhi Kendras**
- Supply of **quality generic medicines**
- Ensuring medicines are sold at **affordable prices**

Generic Medicines

Generic medicines are **pharmaceutical drugs equivalent to branded medicines in dosage, safety, strength, quality, and intended use**, but sold at **lower prices**.

Advantages include:

- **Lower cost**
- **Same therapeutic effect as branded medicines**
- **Greater accessibility to essential drugs**

Healthcare Affordability in India

A significant share of healthcare spending in India occurs through **out-of-pocket expenditure**, especially on medicines.

Affordable drug initiatives like PMBJP help:

- Reduce **financial burden on households**
- Improve **access to essential medicines**
- Strengthen **public health equity**

KEY HIGHLIGHTS

- **Affordable Medicines:** PMBJP provides **high-quality generic medicines at significantly lower prices** compared to branded alternatives.
- **Jan Aushadhi Kendras:** Dedicated pharmacies established across the country to **distribute generic medicines to the public**.

- **Wide Product Range:** Includes **essential medicines, surgical items, and medical consumables**.
- **Healthcare Accessibility:** Improves access to medicines in **both urban and rural areas**.
- **Reduced Healthcare Costs:** Helps reduce **out-of-pocket expenditure on medicines**, a major component of healthcare spending.
- **Support to Domestic Pharma:** Encourages **local manufacturing and supply of generic medicines**.
- **Employment Opportunities:** Opening Jan Aushadhi Kendras also **creates livelihood opportunities for pharmacists and entrepreneurs**.
- **Public Health Impact:** Supports **equitable healthcare access**, particularly for economically weaker sections.

PRELIMS BOOSTER BOX

I. **PMBJP:**
   A. **Pradhan Mantri Bhartiya Janaushadhi Pariyojana**.
II. **Implementing Agency:**
   A. Pharmaceuticals and Medical Devices Bureau of India (PMBI).
III. **Administrative Ministry:**
   A. Department of Pharmaceuticals under the **Ministry of Chemicals and Fertilizers**.
IV. **Jan Aushadhi Kendras:**
   A. Retail outlets selling **affordable generic medicines**.
V. **Generic Drugs:**
   A. Bioequivalent to branded medicines but **sold at lower prices**.
VI. **Public Health Importance:**
   A. Helps reduce **out-of-pocket health expenditure**, which constitutes a major share of healthcare spending in India.
VII. **Affordable Healthcare Goal:**
   A. Supports broader initiatives like **universal health coverage**.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Pradhan Mantri Bhartiya Janaushadhi Pariyojana aims to promote the use of affordable generic medicines in India.
2. The scheme is implemented by the Pharmaceuticals and Medical Devices Bureau of India under the Department of Pharmaceuticals.
3. Generic medicines differ from branded medicines in therapeutic effectiveness.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

4.LAKSHADWEEP LOW TEMPERATURE THERMAL DESALINATION (LTTD) PLANT IMPROVES ACCESS TO DRINKING WATER

- The **Low Temperature Thermal Desalination (LTTD)** technology is being used in Lakshadweep to produce **fresh drinking water from seawater using temperature differences in ocean layers**.
- This technology is particularly suitable for **island territories where freshwater resources are scarce and groundwater is often saline**.
- The plant significantly improves **drinking water availability for residents**, reducing dependence on contaminated wells and expensive water transport.
- Developed with the support of Indian scientific institutions, LTTD represents an example of **indigenous technology supporting sustainable development in remote regions**.
- The initiative also strengthens **water security, climate resilience, and infrastructure development in coastal and island ecosystems**.

BACKGROUND / CONTEXT

Low Temperature Thermal Desalination (LTTD)

LTTD is a desalination process that uses the **temperature difference between warm surface seawater and cold deep seawater** to produce fresh water.

Working principle:

1. **Warm surface seawater** is introduced into a chamber maintained at **low pressure**, causing it to evaporate.
2. The **water vapour** produced is then **condensed using cold deep-sea water**, resulting in fresh water.

Key characteristics:

- **Low energy requirement**
- Uses **natural ocean temperature gradients**
- Environmentally friendly compared to conventional desalination methods

Role of NIOT

The technology has been developed by the National Institute of Ocean Technology under the Ministry of Earth Sciences.

NIOT has implemented LTTD plants in several island regions, including:

- **Lakshadweep**
- **Andaman and Nicobar Islands**

Water Challenges in Island Territories

Island regions such as **Lakshadweep** face severe freshwater constraints due to:

- **Limited groundwater availability**

- **Salinity intrusion in wells**
- **High population density on small islands**
- **Climate change and sea-level rise**

Desalination technologies like LTTD provide **sustainable solutions for potable water supply**.

KEY HIGHLIGHTS

- **Innovative Technology:** LTTD converts **seawater into potable water using ocean temperature differences**.
- **Indigenous Development:** Technology developed by the **National Institute of Ocean Technology**.
- **Island Water Security:** Addresses **chronic freshwater scarcity in Lakshadweep**.
- **Low Energy Requirement:** Uses **natural thermal gradients**, reducing energy consumption.
- **Improved Quality of Life:** Residents now receive **clean drinking water at home instead of relying on saline wells**.
- **Climate Resilience:** Enhances **sustainable water infrastructure for island ecosystems**.
- **Scalability:** Technology can potentially be deployed in **other coastal and island regions**.
- **Blue Economy Linkage:** Demonstrates the role of **ocean-based technologies in sustainable development**.

PRELIMS BOOSTER BOX

I. **Low Temperature Thermal Desalination (LTTD):**
   A. Uses **temperature difference between warm surface water and cold deep-sea water** to produce fresh water.
II. **Developing Institution:**
   A. National Institute of Ocean Technology (NIOT).
III. **Administrative Ministry:**
   A. Ministry of Earth Sciences.
IV. **Advantages of LTTD:**
   A. Low energy consumption
   B. Environmentally friendly
   C. Suitable for **island regions**
V. **Lakshadweep:**
   A. Union Territory consisting of **coral islands in the Arabian Sea**.
VI. **Desalination:**
   A. Process of **removing salts and minerals from seawater to produce freshwater**.
VII. **Ocean Thermal Gradient:**
   A. Temperature difference between **warm surface water and cold deep ocean water**.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. Low Temperature Thermal Desalination uses the temperature difference between warm surface seawater and cold deep seawater to produce freshwater.
2. The technology has been developed by the National Institute of Ocean Technology under the Ministry of Earth Sciences.

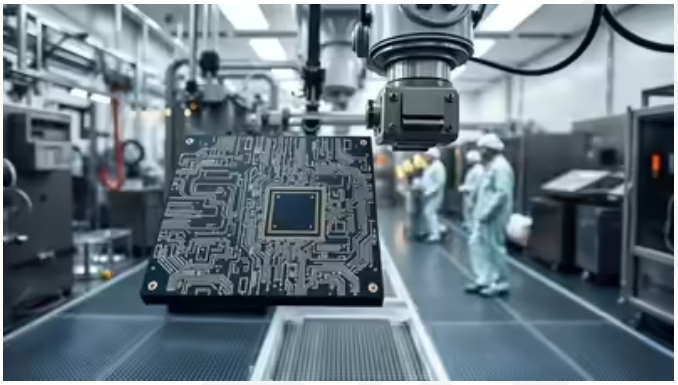
3. LTTD requires large amounts of fossil fuel energy to operate.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

5.DELHI'S LEADING EDUCATIONAL INSTITUTIONS CONTRIBUTING TO INDIA SEMICONDUCTOR MISSIONINDIA SEMICONDUCTOR MISSION



- India is strengthening its semiconductor ecosystem through the **India Semiconductor Mission (ISM)**, with premier academic institutions playing a crucial role.
- Universities and research institutes in Delhi are contributing through **advanced research, semiconductor design programmes, and specialized skill development initiatives**.
- These efforts aim to address the **critical shortage of skilled manpower in semiconductor fabrication, chip design, and electronics manufacturing**.
- Academic institutions also collaborate with industry and government agencies to promote **innovation, technology development, and startup ecosystems in semiconductor technologies**.
- The initiative supports India's strategic goal of achieving **technological self-reliance and reducing dependence on semiconductor imports**.

BACKGROUND / CONTEXT

India Semiconductor Mission (ISM)

India Semiconductor Mission was launched in **2021** to develop a **sustainable semiconductor and display manufacturing ecosystem in India**.

Key objectives include:

- Establish **semiconductor fabrication units (fabs)**
- Promote **chip design and innovation**
- Develop **skilled workforce for semiconductor industries**
- Strengthen **electronics manufacturing value chains**

The mission is implemented by the India Semiconductor Mission under the Ministry of Electronics and Information Technology.

Importance of Semiconductors

Semiconductors are essential components used in:

- **Computers and smartphones**
- **Automobiles and electric vehicles**
- **Telecommunication networks**
- **Artificial Intelligence and defence systems**

Due to their strategic importance, countries are investing heavily in **domestic semiconductor production** to secure supply chains.

Role of Academic Institutions

Universities contribute to the semiconductor ecosystem through:

- **Research in microelectronics and chip design**
- **Training engineers and scientists**
- **Collaborations with semiconductor companies**
- **Development of startup ecosystems and innovation hubs**

Academic participation is critical for building a **sustainable talent pipeline for the semiconductor industry**.

KEY HIGHLIGHTS

- **Academic Contribution:** Delhi's premier institutions are supporting semiconductor research and training under the **India Semiconductor Mission**.
- **Skill Development:** Universities are introducing **specialised courses in semiconductor design, fabrication, and electronics engineering**.
- **Research Ecosystem:** Academic labs contribute to **advanced microelectronics research and chip design innovation**.
- **Industry Collaboration:** Partnerships between **universities, industry, and government agencies** are strengthening the semiconductor ecosystem.
- **Talent Pipeline:** Institutions are helping create a **skilled workforce required for semiconductor fabrication and design sectors**.
- **Technological Self-Reliance:** The initiative supports India's goal of **reducing dependence on imported semiconductor chips**.
- **Strategic Importance:** Semiconductor capability is crucial for **digital economy, defence technologies, and emerging technologies like AI and IoT**.
- **Startup Ecosystem:** Academic institutions also nurture **deep-tech startups and innovation in semiconductor design**.

PRELIMS BOOSTER BOX

I. **India Semiconductor Mission (2021):**
   A. Aims to establish a semiconductor and display manufacturing ecosystem in India.

II. **Administrative Ministry:**
   A. Ministry of Electronics and Information Technology (MeitY).

III. **Semiconductor:**
   A. Material whose electrical conductivity lies **between conductor and insulator**.

   B. Common materials: **Silicon, Germanium**.

IV. **Semiconductor Uses:**
   A. Microprocessors
   B. Integrated circuits
   C. Sensors
   D. Communication devices

V. **Strategic Importance:**
   A. Essential for **electronics manufacturing, defence systems, and emerging technologies**.

VI. **Global Semiconductor Supply Chain:**
   A. Highly concentrated in **East Asia (Taiwan, South Korea, Japan)**.

VII. **India's Objective:**
   A. Build **domestic manufacturing capacity and design ecosystem**.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. The India Semiconductor Mission aims to develop a semiconductor manufacturing and design ecosystem in India.
2. Semiconductors are materials whose electrical conductivity lies between that of conductors and insulators.
3. Semiconductor chips are used only in computers and smartphones.

Which of the statements given above is/are correct?

(a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)