

Current Affairs search results for tag: science-and-technology

1. India's First Pure Green Hydrogen Plant Commissioned In Jorhat (April 22, 2022)

Exploration and production giant Oil India Limited (OIL) has commissioned "India's first 99.999% pure" green hydrogen plant in Jorhat, Assam.

- The Green Hydrogen production capacity of this plant is 10 kg per day which is expected to increase to 30 kg per day later.
- The plant produces green hydrogen from electricity generated by the existing 500 kW solar plant using a 100 KW ion exchange membrane (AEM) electrolyser array.
- Ion Exchange Membrane (AEM) technology is being used for the first time in India.
- OIL has initiated a study with Indian Institute of Technology (IIT)-Guwahati on blending of green hydrogen with natural gas for commercial applications of blended fuels.
- **About Oil India Limited (OIL) -**
- Oil India Limited (OIL) is the second largest Indian-government owned hydrocarbon explorer and producer.
- It is owned by the Ministry of Petroleum and Natural Gas, Government of India.
- Founded- 18 February 1959.
- headquarters - NOIDA
- Chairman & MD- Sushil Chandra Mishra

2. ISRO develops Space Bricks from Martian Soil (April 21, 2022)

Researchers from the Indian Space Research Organisation (ISRO) and the Indian Institute of Science (IISc) have developed a way to make bricks from Martian soil with the help of bacteria and urea.

- ISRO and IISc have collaborated to develop a novel scalable technique of manufacturing space bricks using Martian Simulant Soil (MSS).
- The researcher first made the slurry by mixing Martian soil with guar gum, a bacterium called *Sporosarcina pasteurii*, urea and nickel chloride (NiCl_2).
- This slurry can be poured into moulds of any desired shape, and over a few days the bacteria convert the urea into crystals of calcium carbonate.
- These crystals, along with biopolymers secreted by the microbes act as cement holding the soil particles together.
- The bacteria seep deep into the pore spaces, using their own proteins to bind the particles together, decreasing porosity and leading to stronger bricks.
- These 'space bricks' can be used to construct building-like structures on Mars that could facilitate human settlement on the red planet.

3. The Indian Navy launched the sixth and last submarine of the Kalvari class submarines under Project-75 (April 21, 2022)

The sixth and last of the French Scorpène-class submarines, Vagsheer, was launched at the Mazagon Docks Limited (MDL) in Mumbai.

- The 'Vagsheer' submarine was commissioned by Mrs. Veena Ajay Kumar, wife of Defence Secretary Ajay Kumar, in keeping with the naval traditions of a woman's launch or naming.
- This Scorpene class submarine will undergo sea trials for about 1 year, after which it will be inducted into the Indian Navy after successful completion.
- INS Vagshir is named after a deadly predatory fish found in the depths of the Indian Ocean.
- These submarines have been built by Mazagon Dock Shipbuilders Limited (MDL) in collaboration with France Naval Group in Mumbai.
- The first 'Vagshir' submarine was commissioned in the Indian Navy in December 1974 and was decommissioned in April 1997.
- The new Vagshir submarine is the latest incarnation of its older version.
- **The other five submarines to come from the Kalvari class**

-INS Kalvari -It was launched on 27 October 2015 and commissioned on 14 December 2017.

-INS Khanderi -It was launched on 12 January 2017 and commissioned on 28 September 2019

-INS Karanj - It was launched on 31 January 2018 and commissioned on 10 March 2021.

-INS Vela - It was launched on May 6, 2019 and commissioned on November 25, 2021.

-INS Vagir - It was launched on November 12, 2020 and sea trials have started from February 2022.

- **Features of Scorpene class submarines**

-The Scorpene class submarines are ensured with enhanced features such as advanced acoustic silencing technology, low radiative noise level, hydro-dynamically optimised shape and the ability to strike the enemy with precision weapons.

-These Scorpene-class submarines can attack the enemy with both torpedoes and tube-launched anti-ship missiles, both underwater or on the surface.

-Scorpene submarines can perform a variety of missions, such as anti-surface warfare, anti-submarine warfare, intelligence gathering, mine laying, area surveillance, etc.

- **Project 75-India**

—Project 75 intends to build six diesel-electric attack submarines of the Kalvari class that are based on the Scorpene-class, which are being built at MDL (Mazagon Dock Limited).

—Project 75 (I), approved in 2007, is part of the Indian Navy's 30 year Plan for indigenous submarine construction.

4. Russia test-fires 'world's most powerful' nuclear-capable missile (April 21, 2022)

Nearly two months after invading Ukraine, Russia tested the **Sarmat missile**, a new nuclear-capable intercontinental ballistic missile.

- The test was conducted in Palestek, in the southwestern part of Russia.
- After the test, Russian President Vladimir Putin said that this missile will make Russia's enemies stop and think.
- The Sarmat missile is a new nuclear-capable intercontinental ballistic missile.
- It was test-launched for the first time from Plesetsk in northwest Russia and hit targets in the Kamchatka peninsula, nearly 6,000 km (3,700 miles) away.
- The missile weighs more than 200 tonnes and can transport more than ten warheads.
- As per Russian media, Sarmat is a three-stage, liquid-fueled missile with a range of 18,000 km.
- The missile is 35.3 metres long and 3 metres in diameter.
- The long-range missile has been in the works since the 2000s.
- Russia's nuclear forces will start taking delivery of the new missile "in the autumn of this year" once testing is complete.
- It is among Russia's next-generation missiles that Putin has called "invincible," and which also include the Kinzhal and Avangard hypersonic missiles.
- It has the highest tactical and technical characteristics and is capable of overcoming all modern means of anti-missile defence.
- The missile can hit any target on Earth.

5. Rajasthan becomes first State to get L-root server (April 19, 2022)

Rajasthan has become the first State in the country to get the L-root server, which will enable the State government to provide its flagship digital services and enforce e-governance with seamless internet connectivity.

- The new facility will strengthen internet infrastructure and help improve security and resilience of internet-based operations.

- The server, installed at the Bhamashah State Data Centre, has been installed by the government in association with the Internet Corporation for Assigned Names and Numbers (ICANN).
- After its installation, even if there is a problem in internet connectivity due to any technical fault or natural calamity in the whole of Asia or India, it will continue to run without any interruption in Rajasthan.
- Along with this, high speed internet connectivity will also be ensured.
- The state government in the State is delivering digital services to the people through e-Mitra, Jan Aadhaar Yojana, Jan Kalyan portal, Jansuchna portal and various mobile phone apps.
- There are at present three J-root servers in New Delhi, Mumbai and Gorakhpur and two L-root servers in Mumbai and Kolkata.
- The L-root server in Rajasthan is the first one deployed at the State level.

6. India-made 'warm' vaccine to fight COVID-19 (April 16, 2022)

A vaccine against SarsCov2 being developed in India, that doesn't need to be stored in refrigerators or a cold-chain storage, generated a significant number of antibodies in mouse trials against prevalent variants of the virus.

- The 'warm' vaccine developed by the Bengaluru-based Mynvax laboratories which is a company incubated at the Indian Institute of Science Bangalore.
- The 'warm' vaccine can be stored at 37 degree Celsius for four weeks and at 100 degree Celsius for upto 90 minutes.
- Most other vaccines require to be stored in refrigerators and can be kept at room temperature for no more than a few hours.
- Scientists around the world are working on developing heat-tolerant vaccines.
- A new 'warm' vaccine that does not require refrigeration.
- Results have shown a strong immune response in mice to SARS-CoV-2, the virus that causes COVID-19.

7. India To Build Nuclear Power Plants In "Fleet Mode" From 2023 (March 28, 2022)

The Government of India plans to start construction of ten 'fleet mode' nuclear reactors over the next three years, with the first pour of concrete for a 700 MW atomic power station in Karnataka's Kaiga slated for 2023.

Under the fleet mode, a nuclear power plant is anticipated to be built over a period of five years from the first pour of concrete(FPC).

- The first pour of concrete (FPC) marks the beginning of construction of nuclear power reactors from the pre-project stage which includes excavation activities at the project site.
- The officials of the Department of Atomic Energy informed the Parliamentary panel on science and technology that the “ FPC of Kaiga units 5&6 is expected in 2023; FPC of Gorakhpur Haryana Anu Vidyut Praiyonjan units 3 & 4 and Mahi Banswara Rajasthan Atomic Power Projects units 1 to 4 is expected in 2024; and that of Chutka Madhya Pradesh Atomic Power Project units 1 & 2 in 2025”.
- The Centre had approved construction of 10 indigenously developed pressurized heavy water reactors (PHWR) of 700 MW each in June 2017. The ten PHWRs will be built at a cost of Rs 1.05 lakh crore.
- The PHWRs, which use natural uranium as fuel and heavy water as moderator, have emerged as the mainstay of India’s nuclear power programme.
- India’s first pair of PHWRs of 220 MW each were set up at Rawatbhata in Rajasthan in the 1960s with Canadian support.
- As many as 14 PHWRs of 220 MW each with standardized design and improved safety measures were built by India over the years. Indian engineers further improvised the design to increase the power generation capacity to 540 MWe, and two such reactors were made operational at Tarapur in Maharashtra.

For additional information on Nuclear power, kindly see the 24 March 2022 post.

8. Oxygen Plus - Smartphone-based portable oxygen kit (March 25, 2022)

An easy to handle and transport, multi-modal, smartphone-based, field-portable oxygen concentrator called Oxygen Plus was designed by GRS India, a Department for Promotion of Industry and Internal Trade (DIPP) Government of India, recognized start-up.

The device can be used by for oxygen support during medical emergencies, trauma as well as disasters to protect people from the risk of breathing contaminated air.

9. No country met WHO air quality standard in 2021 (March 22, 2022)

Not a single country managed to meet the World Health Organisation's (WHO) air quality standard in 2021. In a survey conducted in 6475 cities in 117 countries by IQAir, a Swiss pollution technology company, showed that pollution and smog has increased in some cities of the world after a COVID-related dip.

The IQAir's annual World Air Quality Report 2021 was released on 22 March 2022.

The WHO recommends that average annual readings of small and hazardous airborne particles known as PM2.5 should be no more than 5 micrograms per cubic metre.

But only 3.4% of the surveyed cities met the standard in 2021,

As many as 93 cities saw PM2.5 levels at 10 times the recommended level.

Highlights of the IQAir's annual World Air Quality Report 2021

It has ranked the country on the basis of average PM2.5 concentration (micrograms per cubic metre).

Most Polluted Country in the world (in descending order) , Pm 2.5 concentration (micrograms per cubic metre)

1. Bangladesh 76.9
2. Chad 75.9
3. Pakistan 66.8
4. Tajikistan 59.4
5. India 59.1

Least polluted country/territory in the world (New Caledonia) 3.8**Most Polluted Capital city (in descending order),micrograms per cubic meter**

1. New Delhi 85.00
2. Dhaka (Bangladesh) 78.1
3. N'Djamena (Chad) 77.6
4. Dushanbe(Tajikistan) 59.5
5. Muscat(Oman) 53.9

Least polluted capital city Noumea(New Caledonia) 3.8

Most Polluted City in the world (in descending order)

1. Bhiwadi (Rajasthan)
2. Ghaziabad (Uttar Pradesh)
3. Hotan (China)

Kindly also see 7 March 2022 post on Air Pollution and PM 2.5**Important for Exam****World Health Organisation (WHO)**

It is a specialised agency of the United Nations .

It was set up on 7 April 1948

Headquarters : **Geneva , Switzerland**

Director General of WHO: **Tedros Adhanom Ghebreyesus of .Ethiopia**

10. Country's first Artificial Intelligence & Robotics Technology Park launched in Bengaluru (March 15, 2022)

The country's first Artificial Intelligence & Robotics Technology Park (ARTPARK) was launched in **Bengaluru** on 14 March 2022. It is promoted by a not-for-profit foundation set up by the Indian Institute of Science (IISc) Bengaluru.

- The Park has been set up with a capital of Rs 230 crore out of which the central government contribution is Rs 170 crore and the Karnataka government contribution is Rs 60 crore.
- The ARTPARK will work on creating a globally leading Artificial Intelligence (AI) and Robotics Innovation ecosystem in the country.

Indian Institute of Science (IISc)

- The Indian Institute of Science was set up in 1909 at **Bengaluru, Karnataka** by a partnership between the industrialist JRD Tata, the Mysore royal family and the Government of India.
- IISc is India's premier institute for advanced scientific and technological research and education.
- In 2018, IISc was selected as an Institution of Eminence (IoE) by the Government of India.