Prelim Bits 23-12-2022 | UPSC Daily Current Affairs

Sand Battery

A new battery technology that uses sand to store thermal energy may aid clean energy solutions for Europe's energy crisis.

- Countries in the Northern Hemisphere rely on a central heating system in winters, with natural gas as the most common heating fuel.
- Thermal energy storage is seen as a solution for renewable sources for central heating system.
- In this growing field, a new battery technology uses sand as a medium to store thermal energy.
- **Sand Battery** - It was invented by Polar Night Energy, a Finland-based company.
- This battery is located in a town called Kankaanpää, Western Finland.
- The battery has a fully enclosed 4 metres wide and 7 metres high steel container with 100 tonnes of recycled sand.
- The sand becomes a battery after it is heated up to 600C using electricity generated by wind turbines and solar panels.



- **Utility** - The 'silo' supplies warm water to a district heating network connected to both resident and commercial buildings.
- A district heating system circulates hot water to keep buildings warm, industrial processes and public water systems.
- **Storage Capacity** - The latest battery model can store up to 8 megawatt-hours of energy as heat.
- **Prevention of Heat loss** - Sand has a low heat conductivity.
- The reservoir is so well-insulated from the outer environment that it can retain temperatures up to 600 °C.
- The sand at the core is very far from the boundary, so the heat stored does not easily get lost, even for days or weeks.

References

- Down To Earth - Sand battery: a solution for Europe's energy crisis
- BBC - How a sand battery could transform clean energy?

Lion @ 47: Vision for Amrutkal

The Central Government has prepared the Project Lion document titled 'Lion @ 47: Vision for Amrutkal' for Lion conservation.

- The document titled 'Lion @ 47: Vision for Amrutkal' was prepared as part of the 'Project Lion' for conservation of Asiatic Lions in Gir, Gujarat.
- The objectives of the document is to
    1. Secure & restore lions' habitats for managing its growing population;
    2. Scale up livelihood generation and participation of local communities;
    3. Become a global hub of knowledge on big cat disease diagnostics and treatment and
    4. Create inclusive biodiversity conservation through project lion initiative.
- **Project Lion** – The Project Lion envisages landscape ecology based conservation of the Asiatic Lion in Gujarat by integrating conservation and eco-development.
- The Project is being implemented in the Gir landscape in Gujarat which is the last home of the Asiatic lion.
- **Implementation** - The State Government of Gujarat and other stakeholders like Central Zoo Authority.
- **Funding for Lion Conservation** – Grants released under the Asiatic Lion Conservation project.
- Funds released to the State as Central share under Asiatic Lion Conservation project.
- Financial assistance is provided to State of Gujarat for conservation of wildlife including Asiatic Lions under the Centrally Sponsored Scheme (CSS) - 'Development of Wildlife Habitats' during last three years.

References

1. PIB - 'Lion @ 47: Vision for Amrutkal'

UNSC Resolution 2593

India reminded the Taliban about the UN Security Council Resolution 2593 that had called for upholding of women's rights in Afghanistan.

- The **India-led UNSC Resolution 2593 on Taliban** was adopted by the United Nations Security Council in August 2021.
- It condemned the attacks near Hamid Karzai International Airport in Kabul, Afghanistan, by the Islamic State in Khorasan Province, an entity affiliated with the Islamic State in Iraq and the Levant (Da'esh).
- The UNSC Resolution 2593 reiterates the importance of **combating terrorism and terror financing in Afghanistan**, including those individuals and entities designated pursuant to resolution 1267 (1999).
- It calls for strengthened efforts to **provide humanitarian assistance** to Afghanistan.
- It reaffirms the importance of upholding human rights including those of women, children and minorities.
- It wants all parties to seek an inclusive, negotiated political settlement, with the full and equal participation of women, that would build on Afghanistan's gains over the last 20 years in adherence to the rule of law.

- This resolution expects that the Taliban facilitate safe, secure, and orderly passage for people wanting to leave Afghanistan.
- To know more about the UNSC Resolution 2593, click here.
- **Similar Topics -** UNSC Resolution 47 on Kashmir, Osaka Declaration (UNSC Resolution 2462), AIDS-free by 2030 (UNSC Resolution 1308)

Reference

1. The Hindu - India expresses concern over Taliban banning higher education for Afghan women
2. UNdocs.org - Resolution 2593 (2021)
3. The Hindu - UNSC resolution addresses 'key concerns' on Afghanistan

Acidification of Great Lakes

According to a study NOAA's Ocean, Coastal, and Great Lakes Acidification Research Plan, by 2100, even the Great Lakes of North America might approach acidity at the same rate as the oceans.

- It is a known fact that the increase in atmospheric carbon dioxide has caused the world's oceans to turn more acidic, but the new finding that the freshwater bodies are also turning acidic is a shock.
- Scientists are building a sensor network to measure the carbon dioxide and pH levels of the Lakes, starting with developing a system to detect the water chemistry trends of Lake Huron, one of the five Great Lakes.

Acidification is a phenomenon resulting from the release of protons from certain substances into the ecosystem. These emissions increase the acidity (decrease in pH) of water and soils.

- **Acidification of water bodies -** Acidification of oceans or freshwater bodies takes place when excess carbon dioxide in the atmosphere gets rapidly absorbed into them.
- The absorption of carbon dioxide leads to a lowering of the pH, which makes the water bodies more acidic.

According to the National Oceanic and Atmospheric Administration (NOAA) of the US government, in the 200 years alone, ocean water has become 30% more acidic.

- **Consequences of acidification -** The rich ecosphere of the Great Lakes is under threat as these lakes would witness a pH decline of 0.29-0.49 pH units - meaning they would become more acidic - by 2100.
- Acidification may lead to
    1. decrease in native biodiversity,
    2. create physiological challenges for organisms, and
    3. permanently alter the structure of the ecosystem.

- It would also severely impact the hundreds of wooden shipwrecks that are believed to be resting at the bottom of these lakes.
- **Similar Topics** - Arctic Acidification

Great Lakes

- The Great Lakes of North America, or simply the Great Lakes, are five interconnected bodies of water straddling the US-Canada border.
- They are the largest group of freshwater lakes in the world.
- They drain into the Gulf of St Lawrence in the North Atlantic through the St Lawrence River.
- The Great Lakes are Superior, Michigan, Huron, Erie, and Ontario.
    1. The US-Canada border passes through Lakes Superior, Huron, Erie, and Ontario.
    2. Lake Michigan lies entirely in the US.
- **Formation** - The Great Lakes are believed to be formed in some 20,000 years ago, when the Earth started to warm and water from melting glaciers filled the basins on its surface, according to NOAA.
- **Significance** - Today, the Great Lakes contain a fifth of the world's total freshwater and are a crucial source of irrigation and transportation.
- The Great Lakes also serve as the habitat for more than 3,500 species of plants and animals.

Reference

1. Indian Express - US-Canada Great Lakes turning acidic
2. Science Direct - Acidification

Wandiwash

Encroachment continues unabated in the premises of Wandiwash Fort and waits for makeover.

- Wandiwash (the anglicised version of *Vandavasi*) is a town located about 120 km from Chennai in the present-day Tiruvannamalai district.
- **Battle of Wandiwash** - The place is historically known for the famous Battle of Wandiwash, of January 1760.
- The battle of Wandiwash is a significant battle in the Third Carnatic War, where the French attempts to capture Fort of Vandavasi.
- In the battle of Wandiwash, the British led by Eyre Coote (1726-1783), defeated the French forces under Thomas-Arthur, Comte de Lally (1702-1766).

  The Seven years' war in Europe led to the Carnatic war III between the French and British powers in India and the war ended with the Treaty of Paris in 1763.

- **Significance of the battle** - The victory of the British over the French, established their supremacy in India.

- The battle also helped to vanquish the native powers.
- This victory let Coote to go on to defeat Hyder Ali ofMysore (1722-1782) in June 1781 at Parangipettai (Porto Novo).
- **The Fort** - The fort of Vandavasi is said to belong to the 16th-17th Century CE.
- The fort premises were originally spread over 2.6 hectares (or about 6.4 acres).
- The fort walls were as high as 18 feet and even has a moat around it.
- A cannon is kept at the south-western corner of the fort along with a notice giving a brief account of the place.
- The remains of the fort had a makeover in early 2010 at the time of the 250th anniversary of the battle.

> *"If it was Plassey in the North, in the South it was Wandiwash that changed the course of Indian history that paved the way for laying the foundation of the British domination exterminating the French out of the scene." – An article published in a newspaper 55 years ago.*

Important place for Jains

- The population of Jains is more in this area than in the rest of Tamilnadu.
- Out of the 59 sacred places in the Tamilnadu for the Jains, 28 are in Tiruvannamalai district, mostly in and around Vandavasi.

References

1. The Hindu - The famous Battle of Wandiwash

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