A Few Minutes Series

Subject – Science & Technology

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Sand Battery

Context

- A new battery technology by a Finland-based company that uses sand to store thermal energy may aid clean energy solutions. The innovation comes at a time when Europe is facing an unprecedented energy crisis.

Background

- Russia — the supplier of **40 per cent of the European Union's natural gas supply** — has shut off its pipelines to a large extent. Countries in the Northern Hemisphere rely on a central heating system in winters, with natural gas as the most common heating fuel. This is unlike developing countries with a tropical climate.

Sand Battery

- A "sand battery" is a high temperature thermal energy storage that uses sand or sand-like materials as its storage medium. It stores energy in sand as heat.

How does the sand battery work?

- Just like conventional energy storage systems, when excess power is generated through renewable sources than is required, it is **directed towards the sand battery.**
- Instead of trying to move electrons from one electrode to the other or power pumps to send water to a higher reservoir, **a sand battery uses resistive heating to increase** the temperature of the air, which is then transferred to sand through a heat exchanger.
- With the melting temperature of the sand in **hundreds of degrees Celsius,** a tower of sand has a high potential to store energy. More importantly, sand store this energy for many months together, making it a viable long-term storage solution.