

Sindhuja-I: Seawave Energy Converter

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In news— Recently, researchers at IIT Madras have developed and deployed a system that could generate electricity using energy from seawaves.

About the Sindhuja-I:

- The system, dubbed Sindhuja-I (which means 'generated from the ocean'), was **deployed by the researchers about six kilometres from the coast of Tuticorin in Tamil Nadu**, where the sea has a depth of about 20 metres.
- Sindhuja-I can currently **produce 100 watts of energy**. It will be scaled up to produce one megawatt of energy in the next three years.
- It **consists of a floating buoy, a spar and an electrical module. The buoy moves up and down as the waves oscillate up and down.**
- There is a hole at the centre of this buoy that will allow the spar to pass through it. The spar is fixed to the seafloor to ensure that the waves don't move it.
- But when the buoy moves and the spar doesn't, the waves produce a relative motion between both. **This relative motion is used by an electric generator to produce power.**
- But building such a complex system at an offshore location comes with its own set of challenges.
- For example, the amount of energy generated from wind energy fluctuates over the course of the day and over the course of the year as the climate changes.
- While the IIT **Madras researchers wave energy generation device uses a technology called "point absorber wave energy converter"**, it is only one of the many such technologies being developed by companies around the world.

- IIT Madras partnered with a start-up Virya Paramita Energy (VPE) Pvt Ltd, and Motilal Nehru National Institute of Technology (MNNIT) Allahabad, for this test.
- **Islay LIMPET, the first grid-connected wave energy power device in the world** deployed in 2000, uses a shoreline device that **uses “Oscillating Water Column” technology** to generate power. It was later decommissioned in 2018.