

OFFSHORE FLOATING WAVE – SOLAR HYBRID ENERGY CONVERTER SYSTEM AND METHOD THEREOF

IITM Technology Available for Licensing

Problem Statement

- Renewable sources of energy such as wave energy and solar can help support the rising demand for energy across the world.
- However **solar power generators** have their own limitations such as, they **charge slowly** and **cannot store a large amount of power** due to their low wattage capacity.
- Existing wave and solar energy generators require **floating buoys with complex design as the generator is fixed to the seabed**.
- There is a need to achieve an **efficient and economical** way to extract abundant energy from the sea waves and solar radiation.

Intellectual Property

- IITM IDF Ref.2490
- IN 529207 Patent Granted

TRL (Technology Readiness Level)

TRL 2 Technology concept formulated

Technology Category/ Market

Category- Energy, Energy Storage & Renewable Energy

Industry Classification:

- NIC (2008)- 35106- Electric power generation using other non conventional sources; 35105- Electric power generation using solar energy; 2710- Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus.

Applications:

Power for charging batteries and powering underwater drones, subsea sensors, offshore communication equipment and drilling platforms.

Market drivers:

The global renewable energy market size was estimated at USD 1.21 trillion in 2023 and is expected to grow at a compound annual growth rate (CAGR) of 17.2% from 2024 to 2030.

Research Lab

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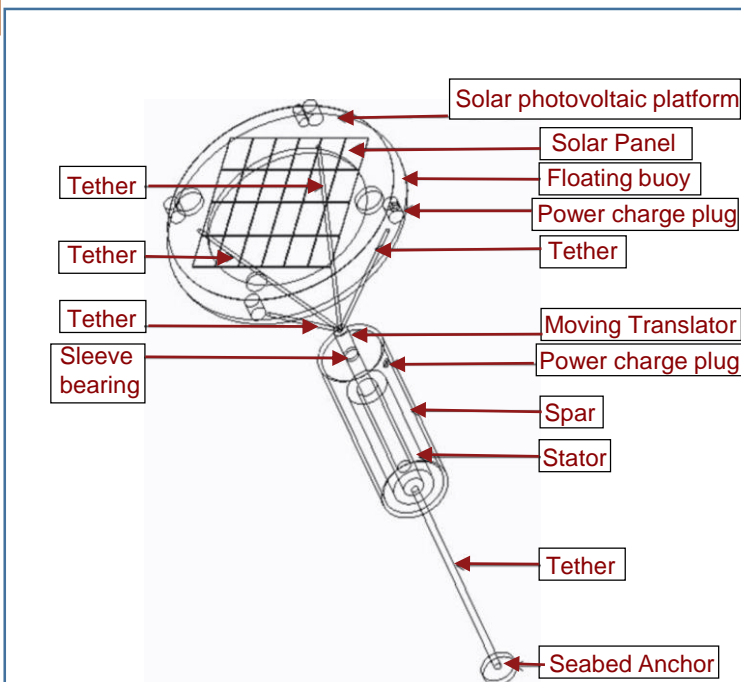


Figure: An isometric view of the overall assembly according to the present invention.

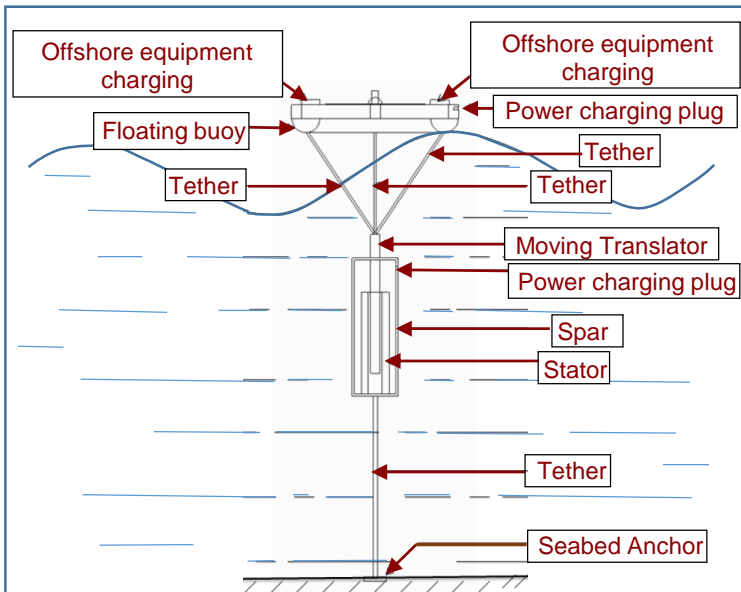


Figure: Front view of the spar and floating buoy with the photovoltaic platform according to the present invention.

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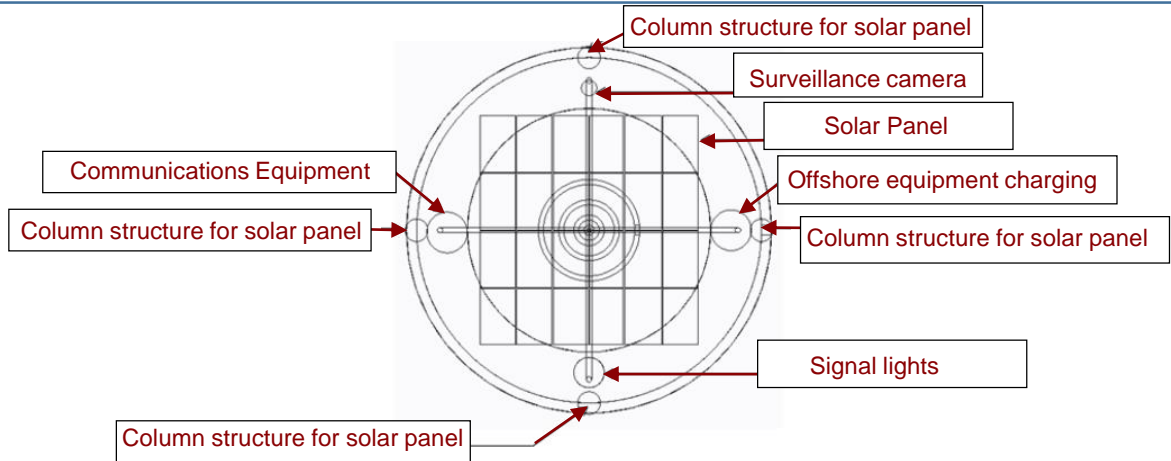


Figure: Illustrates a top view of an embodiment of the present invention.

Technology

The present invention provides a wave energy converter and a solar photovoltaic platform, with solar panels constructed on the column structures of the floating buoy

The assembly also comprises a spar platform, wherein the floating buoy moves due to incident water waves. Subsequently, the motion of the floating buoy is converted into a reciprocating motion of the linear generator shaft arrangement. Further, the continuous reciprocating motion causes the generator to produce electrical energy

The solar panels produce electrical energy depending on the intensity of the sun

This results in mass power generation, which could be used to charge offshore equipment. Batteries can be charged plugs on the buoy and spar.

Key Features / Value Proposition

- The invented wave energy generation technology enables the power generator to be attached to the tether enabling a simple design with affordable construction. Whereas, conventional wave energy generators are attached to the seabed which requires complex design.
- The technology reduces the manufacturing costs when compared to conventional technologies that are difficult to manufacture because of their complex designs.
- The simultaneous generation of wave and solar energy enables mass power production for powering offshore equipment. Energy from conventional sources cannot be supplied to offshore regions without use of expensive equipment.
- Compared to fixed conventional fixed solar panels the invented technology allows use of a novel photovoltaic system with simplified configuration and accurate Sun tracking to enhance power generation efficiency.

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