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A Low Speed High Torque Hydrostatic Powertrain for Renewable Energy Application

Hydrostatic powertrain with adaptive torque ratio boosts renewable turbine efficiency while reducing nacelle weight and impact.

Wind and Marine Hydrokinetic Energy Systems require the use of a transmission to transmit torque from the turbine to the electric generator. Researchers at Purdue University have developed a transmission system that uses an adaptive transmission ratio, allowing for the optimization of the speed and torque going into the generator. This approach improves system efficiency, while also allowing for individual control of turbines and generators across an array, leading to the potential for networks of systems that work cohesively for maximum efficiency. Additionally, this powertrain allows for the detachment of the generator from the turbine, which reduces the weight of the turbine nacelle and allows the transmission to be placed in an area that is more convenient for maintenance. This technology is also capable of using water as a working fluid, which minimizes the environmental impact of leakages.

Advantages:

- Improved efficiency

- Adaptable torque ratio

- More easily accessible for maintenance

- Lower weight in nacelle

- More environmentally friendly in the case of a fluid leak

Applications:

- Wind Energy Systems

- Marine Hydrokinetic Energy Systems

Technology ID

2021-SHAN-69450

Category

Energy & Power Systems/Power Generation

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View online

- Turbine Energy Generation

- Renewable Energy Generation

TRL: 3

Intellectual Property:

Provisional-Patent, 2021-08-02, United States

Utility Patent, 2022-07-30, United States

Keywords: Fluid power, Hydraulic Fluid Power, Hydraulics, powertrain, Renewable, Renewable Energy