

What is a wind power generating system (DFIG)?

Wind power-generating systems are one of the clean energy sources, with variable speed and constant frequency being the most widely utilized in DFIGs, which is made up of a wind turbine, a gearbox, an induction motor, and control modules.

What is a wind energy conversion system (WECS)?

Wind energy conversion systems (WECSs), a typical example of renewable energy-producing technology, have been used in new types of power systems. The DFIG-based wind energy conversion system is a typical example of renewable energy power generation technology. The DFIG-based WECS is currently the most extensively used WECS.

What is the control strategy of rotor-side converter in DFIG-based WECS vector control?

The control strategy of the rotor-side converter in DFIG-based WECS vector control is based primarily on the directional control of the stator magnetic chain as an investigation object for modal and stability analysis ,,,,,.

What is ω_m and P_m in a wind turbine?

where, ω_m is the angular velocity of wind turbine, and P_m is the mechanical power output. The mechanical power output varies with the wind speed, and as shown in Fig. 2, when the wind speed is 11.5 m/s, the mechanical power may reach 1.5 MW and run optimally. 2.2. Mathematical model of the induction motor

How does an induction motor work in a wind power production system?

The induction motor in a wind power production system generates a spinning magnetic field through the rotor windings and can function in both power generation and electric modes under the action of the stator windings, which is related to the load torque input. Eq.

How to implement a stator chain vector-based control approach?

However, to implement the stator chain vector-based control approach, the three conditions that follow must be satisfied: 1) precise tracking of the magnetic chain; 2) total disconnection of active power and reactive power; and 3) unimpeded reactive power on the DFIG's stator side.

This paper presents a novel control strategy for power smoothing in generation systems in which power flow variations can occur. These variations are the norm in wind energy generation. The ...

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