

# **Design and comparison of state-feedback and predictive-integral current controllers for active- and reactive-power control in renewable energy systems**

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## **Abstract-**

**This paper deals with the design of a predictive-integral current controller for renewable energy systems connected to the grid through PWM voltage-source converters. The control system is tailored to achieve a deadbeat-type response to set-point step changes and decoupled active- and reactive-power control. An alternative approach is designed by using a state-feedback controller. Both control systems are compared in terms of the robustness of the closed-loop dynamic response and the active and reactive-power coupling when system-modelling errors exist. Simulation and experimental results show that the predictive-integral approach is superior.**

**Index Terms- Renewable energy; Voltage-source converter; Deadbeat system; Predictive control; State-feedback control; Robust control**

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