

Sayyad Nojavan, Majid Majidi, Kazem Zare, 2017, Risk-based optimal performance of a PV/fuel cell/battery/grid hybrid energy system using information gap decision theory in the presence of demand response program, *Intl Journal of Hydrogen Energy*, to appear.

**Abstract**

One of the big challenges that system operators have always dealt with is uncertainty of different parameters in the power systems. In this paper, optimal performance of an on-grid PV/fuel cell/battery hybrid system has been evaluated in the presence of demand response program with considering electrical load uncertainty. Information gap decision theory (IGDT) has been proposed to model the uncertainty of electrical load. Utilizing different strategies obtained through the robustness and opportunity functions, operator will have several options to control the uncertainty. By shifting some percentage of load from peak periods to other periods, DRP flattens load curve and minimizes total cost of hybrid system. A sample system is simulated and the results are compared to validate the proposed techniques.

**Keywords:**

Information gap decision theory (IGDT)  
Hybrid energy system  
Demand response program (DRP)