

This paper presents a multi-nodal intertemporal Cournot gaming model with transmission constraints and uses it to simulate energy-only and capacity-energy market designs in the presence of uncertainties stemming from intermittent renewable power generation. Both market paradigms are compared to a competitive benchmark in order to determine which one performs better in a concentrated market with significant penetration of wind and solar generation. As a specific example, the model is applied to the South Australian zone of the Australian National Electricity Market (NEM). The simulation results for the time interval 2013-2030 show that the capacity-energy market has the potential to induce significant new capacity and push prices much closer to the competitive level in contrast to the current energy-only market design.