

**THE EFFECTS OF INTEGRATING WIND POWER ON TRANSMISSION SYSTEM  
PLANNING, RELIABILITY, AND OPERATIONS**

Report on Phase 2:  
System Performance Evaluation

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### **2.4.1 Effective Capacity of Wind Generators**

The effective capacity of wind generation in the study scenario was quantified using rigorous loss-of-load probability (LOLP) calculations with the Multi-Area Reliability Simulation (MARS) program. The results show that the effective capacities, UCAP, of the inland wind sites in New York are about 10% of their rated capacities, even though their energy capacity factors are on the order of 30%. This is due to both the seasonal and daily patterns of the wind generation being largely “out-of-phase” with NYISO load patterns. The offshore wind generation site near Long Island exhibits both annual and peak period effective capacities on the order of 40% - nearly equal to their energy capacity factors. The higher effective capacity is due to the daily wind patterns peaking several hours earlier in the day than the rest of the inland wind sites and therefore being much more in line with the load demand.