

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

Report on Phase 2:
System Performance Evaluation

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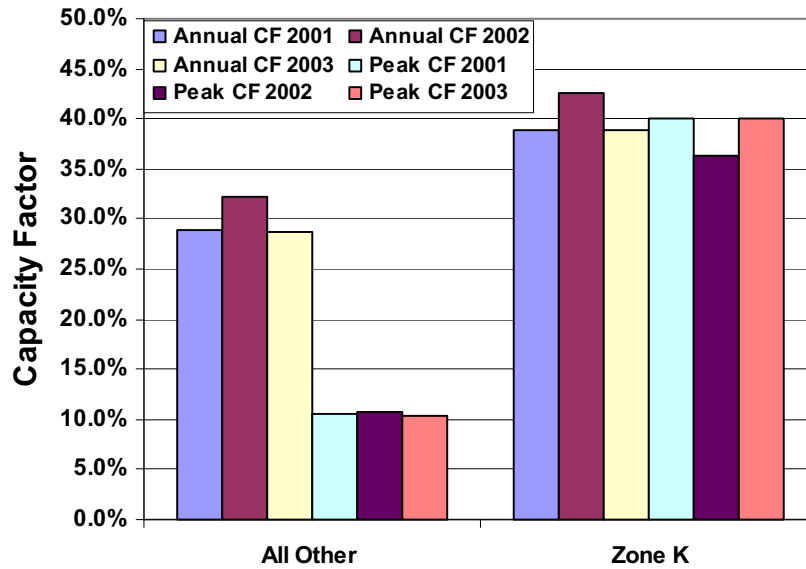


Figure 7.23 NYISO Wind Capacity Factors

7.4 Summary

Capacity factors of inland wind sites in New York are on the order of 30% of their rated capacity. Their effective capacities, however, are about 10%, due to both the seasonal and daily patterns of the wind generation being largely “out of phase” with the NYISO load patterns. The offshore site in Long Island exhibits both annual and peak period effective capacities on the order of 40%. The higher effective capacity is due to the daily wind patterns peaking several hours earlier in the day than the rest of the wind sites and therefore being much more in line with the load demand. As has been noted earlier, these capacity factors are based on the 2001 through 2003 meteorological data combined with the operating characteristics of the 1.5 MW GE wind turbine design. It is expected that future designs will show greater efficiencies with corresponding increases in effective capacities.

An approximate methodology was shown which bases the wind’s effective capacity on the capacity factor during a four-hour peak load period, 1 p.m. to 5 p.m., in the summer months. This produces results in close agreement with the full analytical methodology based on LOLP. This methodology could be used with a “predicted” history based on historical meteorological data and unit availabilities until such time that several years of actual operating history can be developed for a particular site. The actual operating history would automatically include the impact of unit planned and forced outages. Although the primary capacity market is in the summer, this methodology can be adapted for use in the winter capacity market as well.