
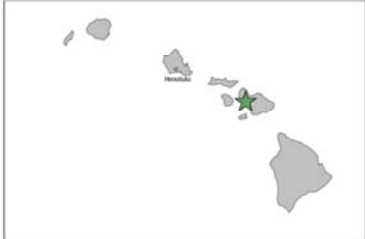


Developer's view of Wind in Northeast Mike Jacobs

VP Transmission, UPC Wind

MAUI, HAWAII (ISLAND GRID)

- 30 MW using 20 - GE 1.5 turbines
- 220 MW System Peak or 14% wind
- 95 MW Night minimum load, frequency impacts
- First wind farm in Maui system



UPC
Feel the Wind. Taste Clean.™

The experience with island grid operator Maui Electric includes the very high penetration solutions that AWEA **anticipates for the long-term**. These include:

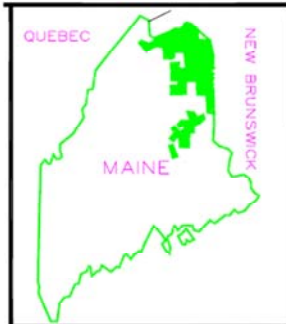
System operator control of windfarm output

Ramp rate controls

Curtailment in low load conditions

Provision of additional reserves

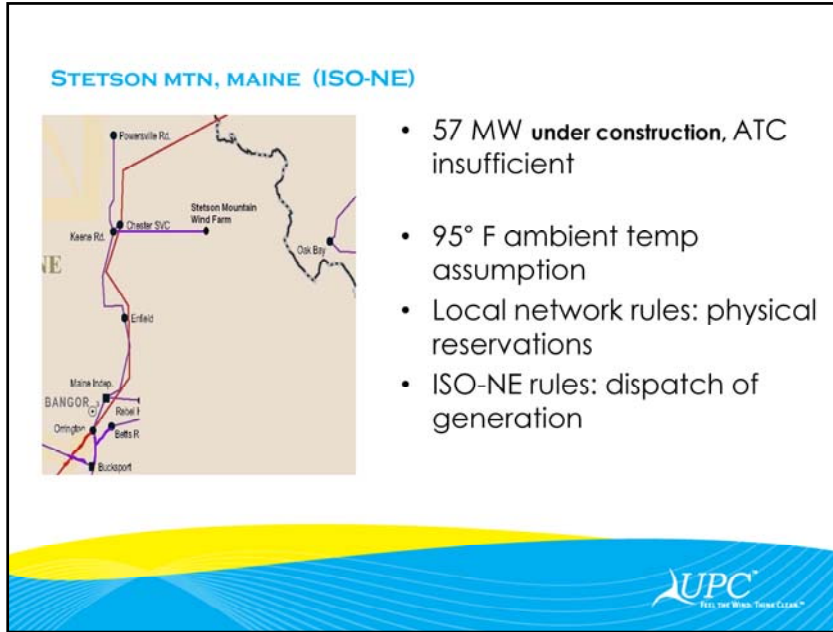
MARS HILL, ME (NMISA)



- 42 MW on 140 MW NMISA system, ~30%
- 42 MW Export to ISO-NE via NB, tie limit exports 105 MW
- \$ payment of Out Service lowered tariff 30% in second year
- Market for energy, capacity and renewables very limited



This project illustrates the circumstances facing imports into ISO-NE from northern control areas. To use the ties, schedules for windfarm output are required. Schedules require forecasting and secondary energy delivery for volumes that do not succeed in scheduling the export.



This is an example of increasing the use of the existing transmission through close evaluation of ATC, non-firm service on the local network, and interaction between local network rules for physical management of congestion, and ISO management of congestion. Additional generation in the area dependent on planned transmission upgrade needed for reliability.

AWEA TRANSMISSION GOALS

- Use the existing grid more efficiently
- Encourage more transmission investment
- Improve wind integration through better designs of turbines, markets, control rooms

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