

Wind Rules and Forecasting Proposal

Robert Pike

BIC

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Background

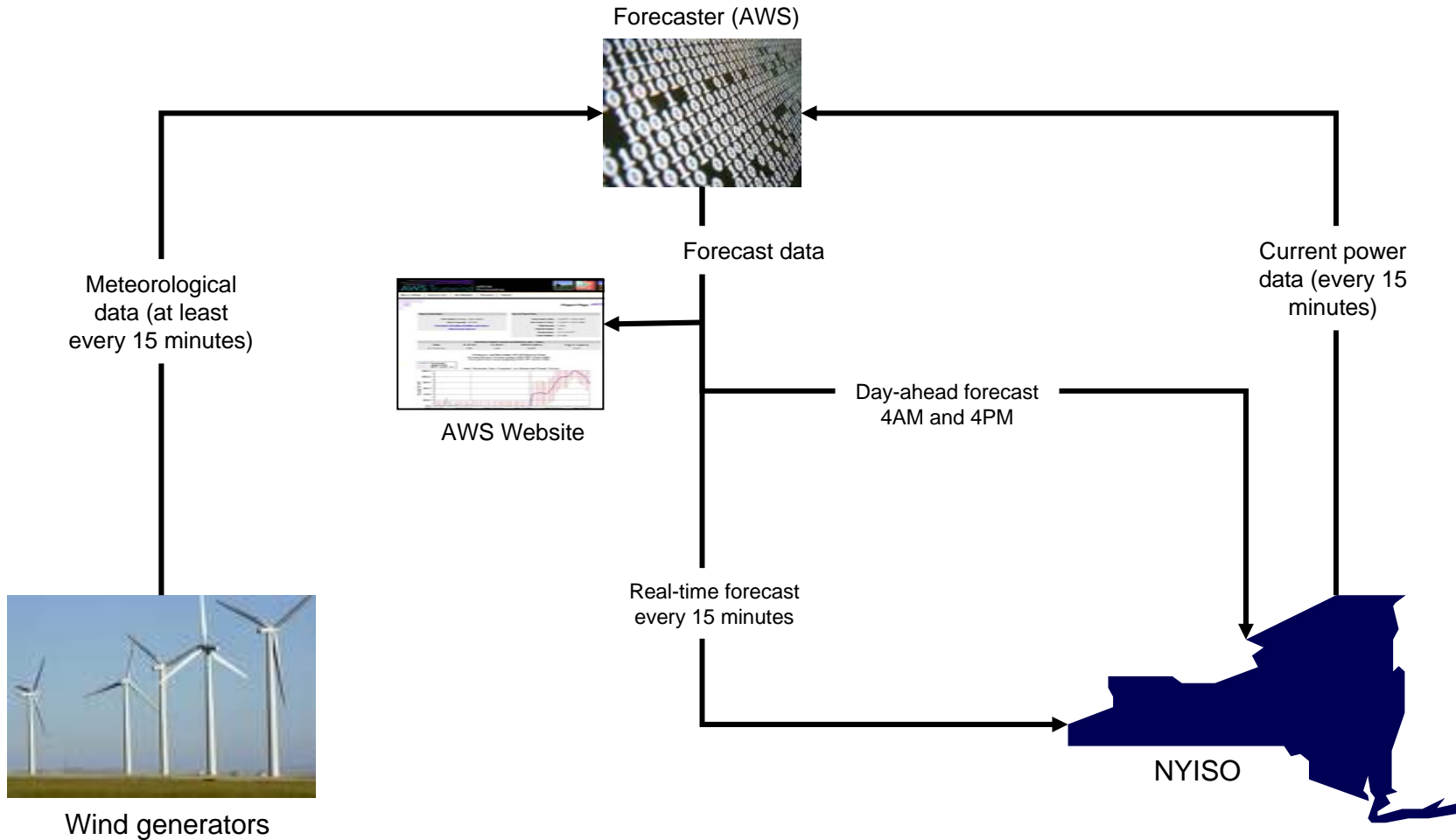
- **Over several MIWG meetings, NYISO has discussed a proposal for forecasting wind generation in the NYCA as well as a set of market rules for scheduling and settlement of wind generators.**
 - **Proposal includes:**
 - Implementation of a centralized statewide forecast
 - Increase of cap/exemption in market services tariff
 - Recovery of forecast fees
 - Description of data communication requirements for wind generators
 - Follow-up studies on impacts of higher levels of wind power penetration

Final Proposal

Wind Forecasting Overview

- **NYISO will be the administrator of a centralized forecast.**
- **Forecasts will be provided to NYISO for all wind generators in the NYCA by a 3rd party wind forecasting company (AWS Truewind).**
- **Forecasts will be provided for both real-time and day-ahead time horizons and will be incorporated into the corresponding market evaluations.**
- **Wind generators will have access to their individual forecast.**
- **Ongoing costs of the forecasting service will be recovered from wind generators.**

Wind Forecasting Data Flow



Meteorological Data Requirements

- Wind generators shall maintain in good working order equipment necessary to:
 - collect meteorological data at its site and
 - transmit to NYISO, or its agent, this data in time intervals identified by the ISO.

- Each wind generator shall be responsible for the cost of installing and maintaining such equipment at its site.

- Meteorological data elements to be collected:
 - Wind speed at hub height
 - Wind direction at hub height
 - Optional - Ambient temperature at 2 meters and hub height
 - Optional - Barometric pressure at 2 meters
 - Optional - Dew point or relative humidity at 2 meters

- Data must be collected from at least one point at the wind generator's site.

- Data must be transmitted electronically to forecaster at least once every 15 minutes, 24x7 in accordance with NYISO procedures.

Meteorological Data Requirements (continued)

- **If a wind generator fails to comply with the meteorological data requirements, NYISO shall take the following actions:**
 - NYISO shall notify the wind generator by written notice of its determination of failure to comply with the meteorological data requirements and that it may impose financial sanctions if the failure is not corrected.
 - NYISO shall offer a reasonable opportunity to correct the failure
 - If, following such reasonable opportunity to cure, such failure is not cured, NYISO may impose daily sanctions of the greater of \$500 or \$20/MW of nameplate capacity until such failure is cured. In egregious cases, NYISO may refer the violating party to the Commission.
 - NYISO shall offer the wind generator an opportunity to be heard by senior officers of NYISO prior to imposing sanctions.

Day-Ahead Rules and Forecasting Approach

- ICAP providing wind generators will not be required to provide DAM bids (no change from current rules).
- No change contemplated for calculation of a wind generator's UCAP. UCAP will continue to be based on historic capacity factors during peak months and hours (no change from current rules).
- Wind generators offering DAM bids will be subject to standard balancing obligations (no change from current rules).
- Day-ahead forecasts of hourly output will be produced daily for the next two days
 - Wind generators will be able to view their individual forecasts by 04:00 and 16:00 Eastern Time
- The day-ahead forecast will be incorporated into the day-ahead market evaluation

Real-Time Rules and Forecasting Approach

- Real-time forecasts of 15-minute output will be produced every 15 minutes for the next 8 hour period
- The real-time forecasts will be incorporated into the RTS market software and used in conjunction with existing persistence-based forecasts of real-time output

Real-Time Rules and Forecasting Approach (cont.)

- **Tariff currently contains a 1,000MW limit on wind generation eligible for:**
 - the exemption from under-generation penalties and;
 - full compensation for over-generation

- **NYISO will increase this limit from 1,000MW to 3,300MW.**

- **Background**
 - **In 2005, a comprehensive study by GE/NYSERDA concluded that NYISO could reliably integrate up to 3,300MW of wind generation. Impacts beyond 3,300 MW were not evaluated.**
 - **In 2008, NYISO will embark on an updated study to determine the steps needed to securely integrate wind generation beyond 3,300MW across all zones in NYS.**
 - The assessment will seek to identify the existence of statewide or locational limitation on the full integration of wind resources. If identified, these limitations may require the establishment of new wind operating protocols, load following capabilities, ancillary service market changes and/or limitations on installations.
 - **Until the 2008 study provides clear direction, NYISO will increase the tariff limit from 1,000MW to 3,300MW, as an interim rules change.**
 - **Current interconnection queue indicates that 3,300MW of wind generation will not be approached until sometime in 2010, by which time NYISO expects to have already re-addressed the tariff limit.**

Reliability Studies

- In 2008, NYISO's planning group will initiate a study of the data collected from wind forecasts and actual wind generation to assess the current and projected impact of wind generation on system operations and reliability. Results of the study will be reported through NYISO's working groups.

- There is approximately 500MW (nameplate) of wind generation on the system.

- There is approximately 1,000MW (nameplate) of wind generation planned for the class year 2008.

- Estimated nameplate capacity of wind generation based on interconnection queue and project status:
 - End of 2008: ~ 1,500 MW
 - End of 2009: ~ 2,500 MW

Forecast fees

- **NYISO will recover forecast fees from active wind generators using the following rates:**
 - **\$500 fixed monthly forecast fee per wind generator +**
 - **\$7.50/MW (nameplate) per wind generator per month.**
 - **For example, a 100MW wind generator would pay \$1,250/month in forecast fees (\$500 + [100MW*\$7.50]).**
 - **Since our forecaster's fees get lower as more wind operators come online, these rates will be revisited annually in order to avoid significant under or over collection.**
 - **Note: Based on expected # and size of wind farms online by end of 2008, the total statewide under/over-collection amount is anticipated to be in the range of +\$3,000 to -\$3,000**
 - **Note: CAISO absorbs greater than 50% of the wind power forecast fees. ERCOT absorbs 100%.**
- **This fee will be filed as a separate rate schedule in the tariff.**

Summary of tariff changes

- Introduces the new NYISO responsibility for developing a statewide wind energy forecast.
- Increases limit applied to wind resource settlement provisions from 1,000MW to 3,300MW.
- Introduces a new rate schedule for forecast fee recovery.
- Describes the requirement for wind generators to send meteorological data to the NYISO forecaster.
- Describes how forecasts will integrate into market runs.

Next Steps

- Present proposal to MC (February 2008)
- Present to BOD (February 2008)
- Tariff Filing – February 2008
- FERC decision – May 2008
- Integrate live forecast into market runs (May 2008)