



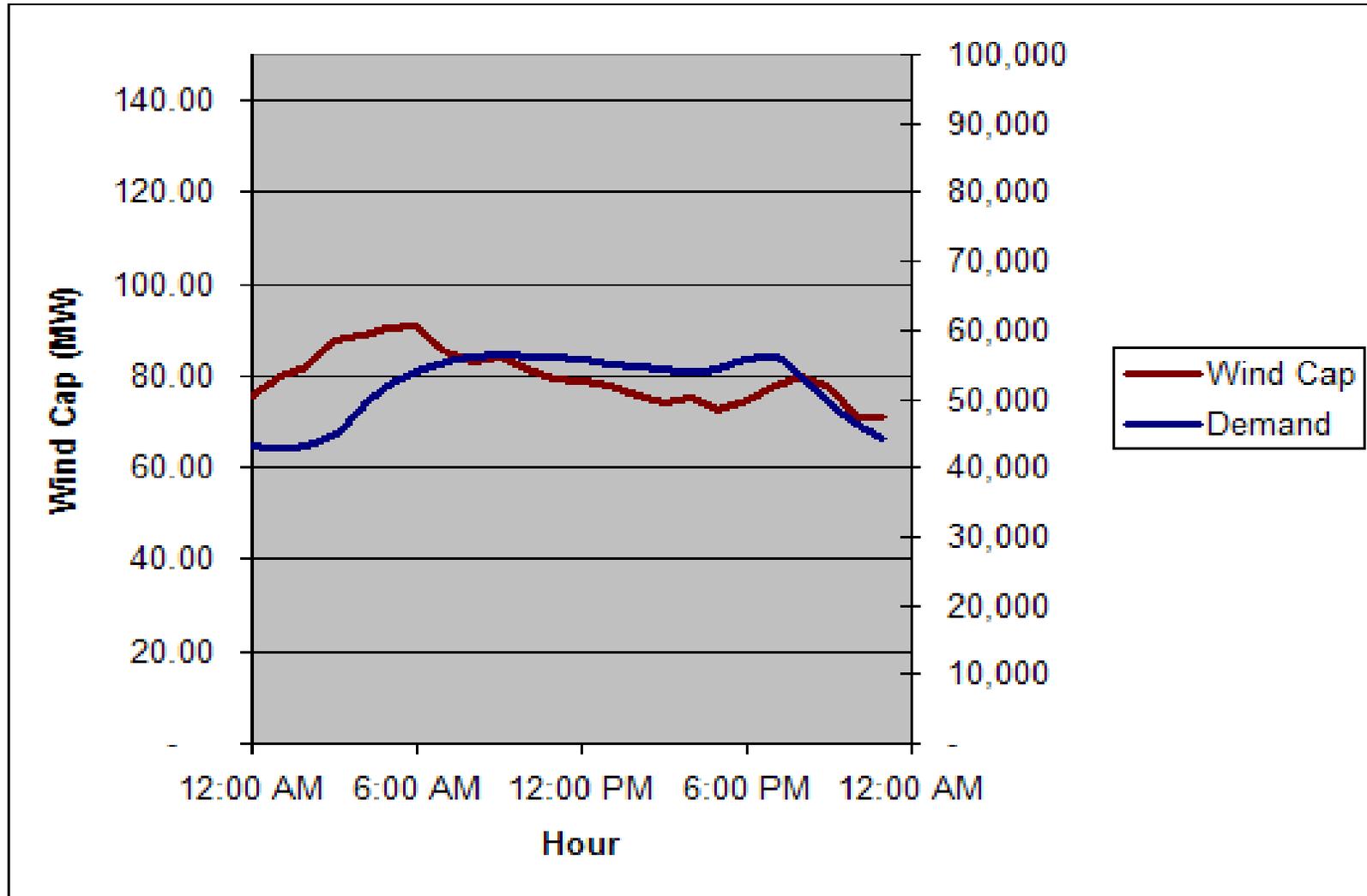
Wind Integration and Transmission Update

Presentation to the Wind Working Group

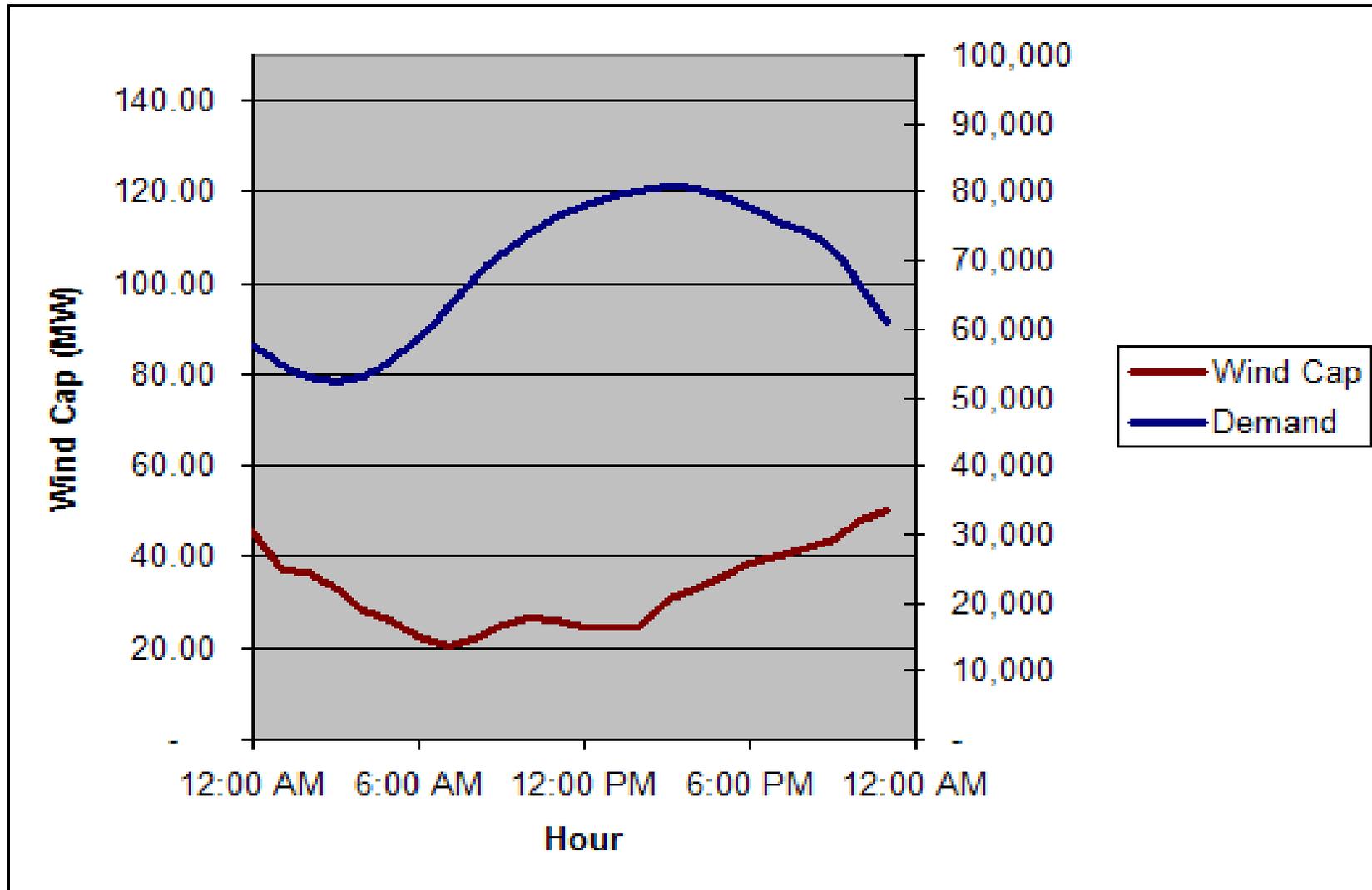
October 12, 2010

Prepared by Cathy Cole, MPSC Staff Engineer

Example: Intermittent Resources

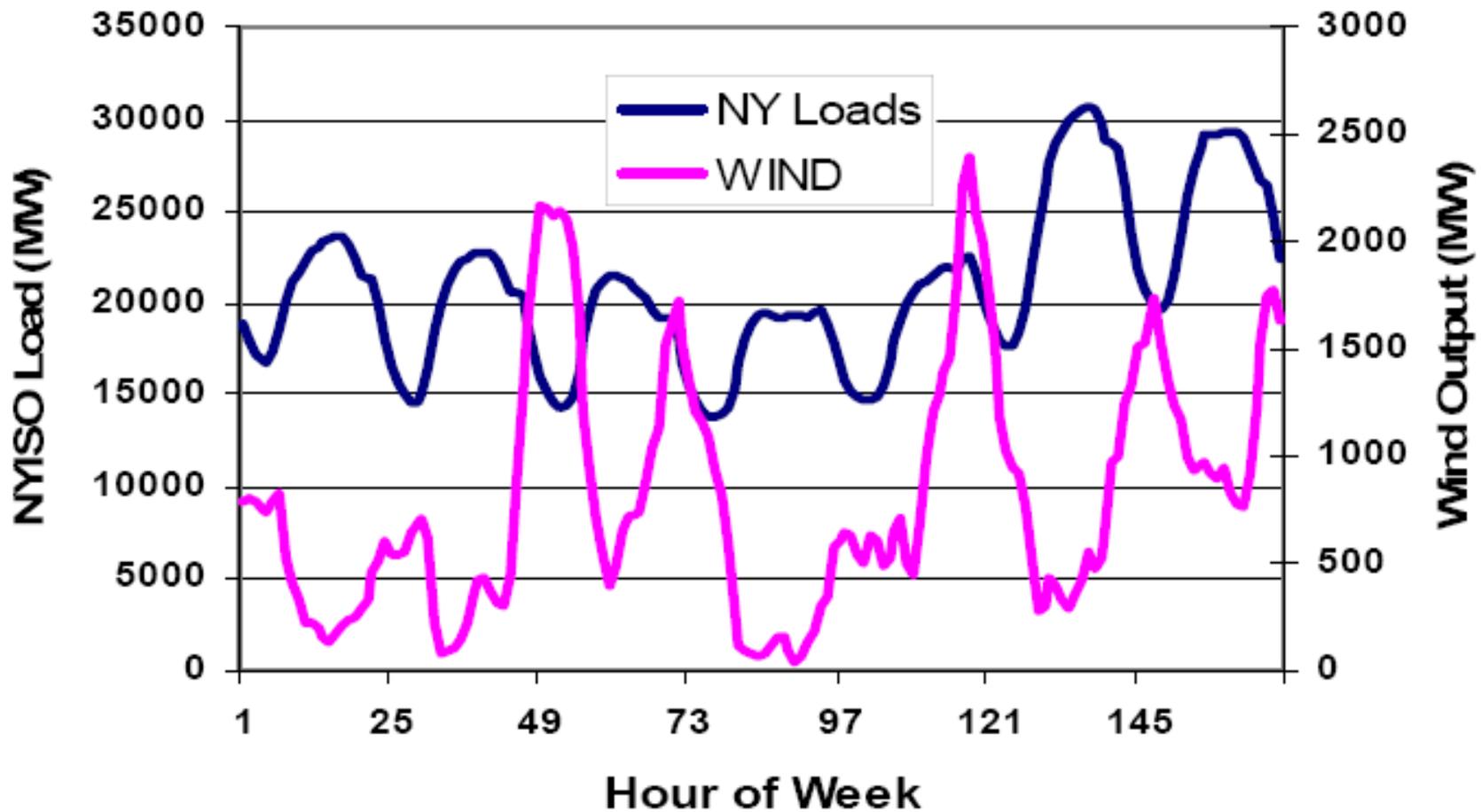


Example: Intermittent Resources

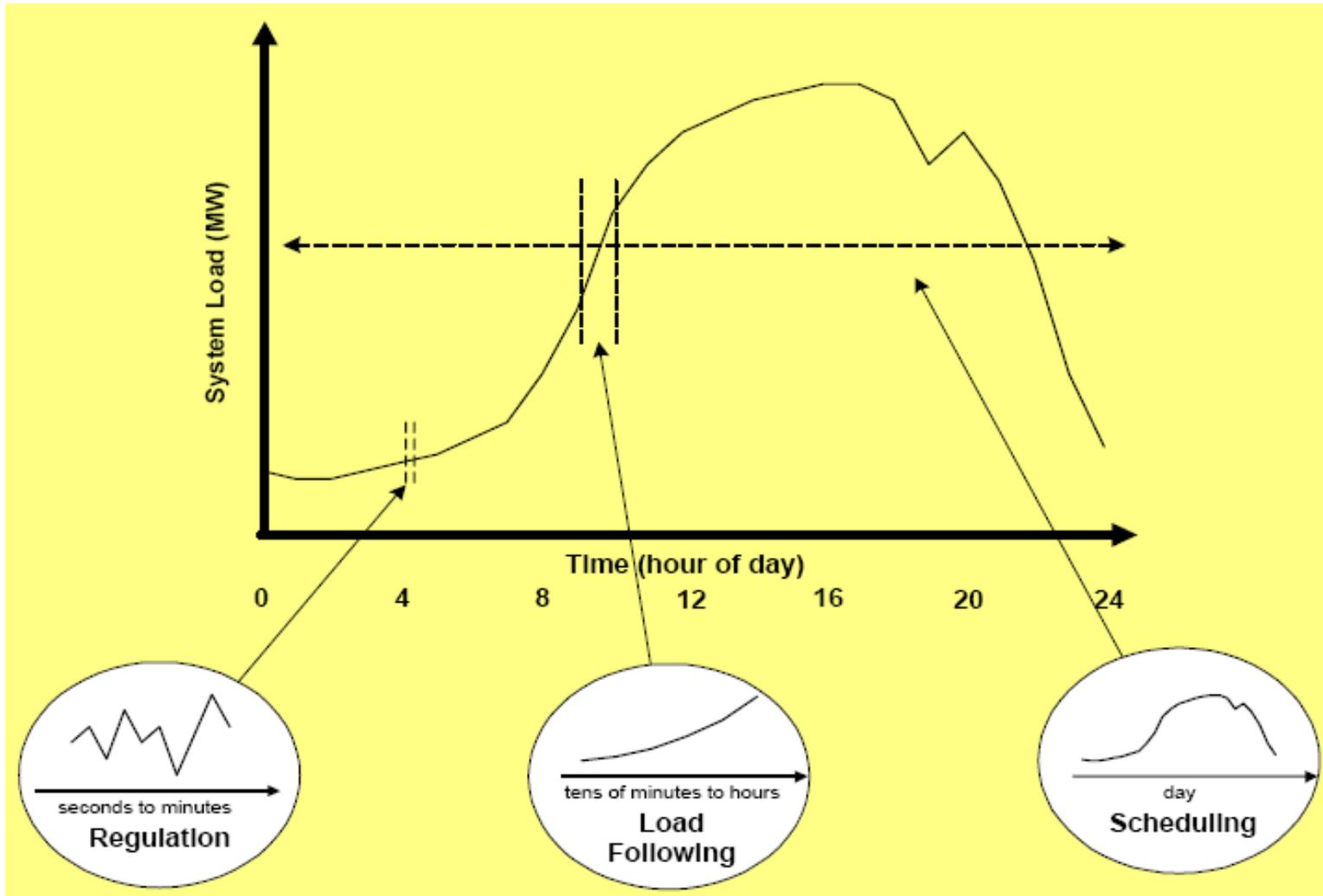




Example: Intermittent Resources



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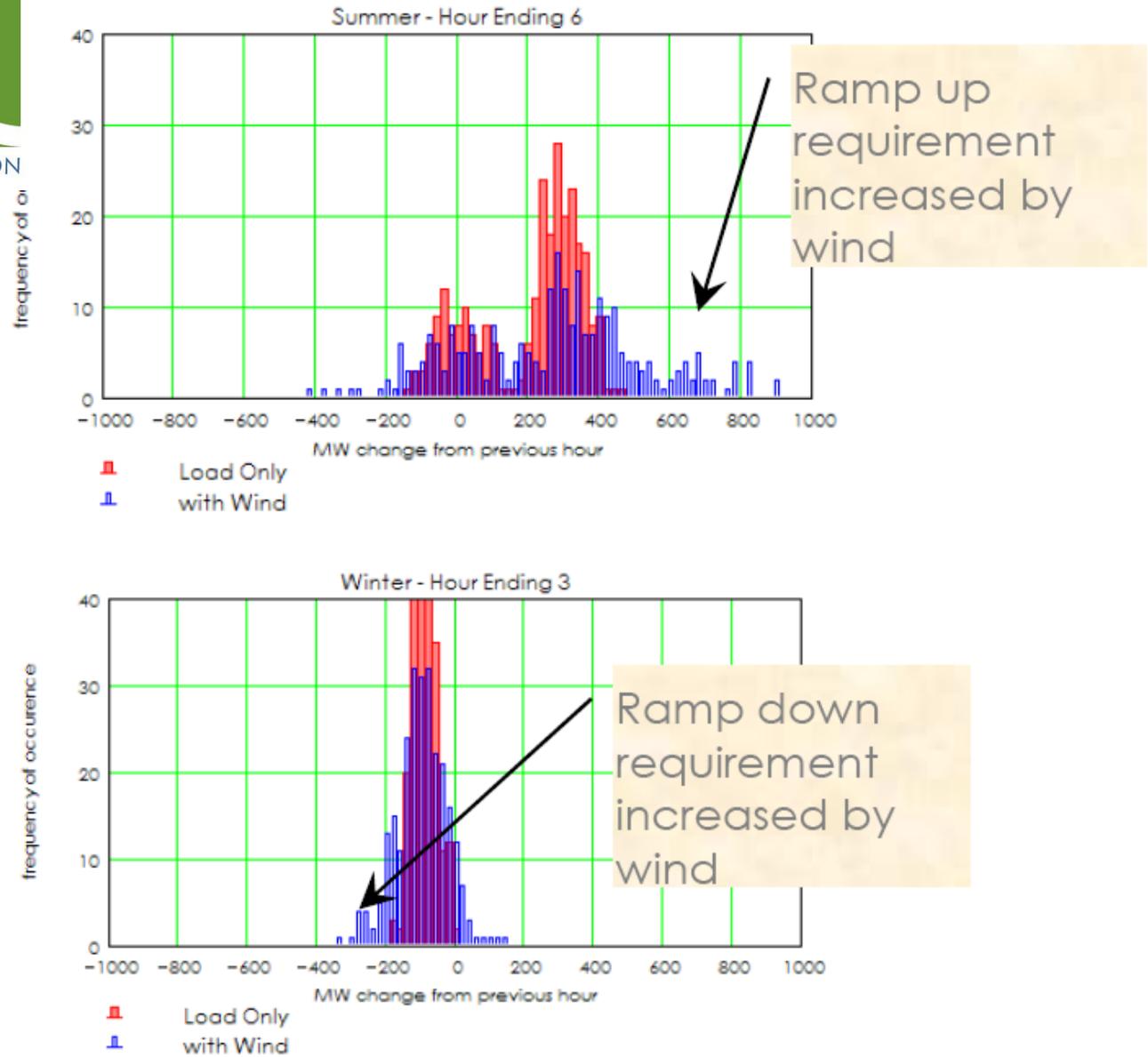


Figure 3. Load following impact on morning/evening ramps for Xcel Energy North



Integrating Renewables

- Geographic diversity
- Add transmission
- Energy storage
- Diversified portfolio of resources including solar, demand response, etc.
- New market products with shorter commitment timeframes?
- MISO is working on a “Dispatchable Intermittent Resource” definition in their tariff



Transmission Update : Michigan

- P.A. 295 Wind Zone Provision
 - Wind zones declared January 2010
 - Expedited siting certificate
 - Applicable for transmission projects that will facilitate the transmission of electricity generated by wind energy conversion systems located in a wind energy resource zone.
 - RTO approval of proposed transmission line required prior to applying for an expedited certificate.



Michigan Thumb Loop: U-16200

- 8/19/10 – Midwest ISO approval of project
- 8/30/10 – ITC filed application for expedited siting
- 9/20/10 – Prehearing – schedule set
- 10/14/10 – Motion hearing for late petitions to intervene
- 10/29/10 – Staff and Intervenor testimony due
- 12/1 – 12/2/10 – Cross Examination hearing
- Commission decision within 180 days of application - on or before 2/25/11

- U-16200 E-docket
 - <http://efile.mpsc.state.mi.us/efile/viewcase.php?casenum=16200>



MISO Wind Integration Update: Transmission

- Transmission cost allocation filing made 7/15/10 to FERC
 - MVP designation – regional cost sharing for upgrades necessary to meet state policy objectives such as RPS
 - Interconnections
 - Many protests and interventions in this docket (FERC docket ER10-1791)
 - MISO requested FERC decision before the end of 2010



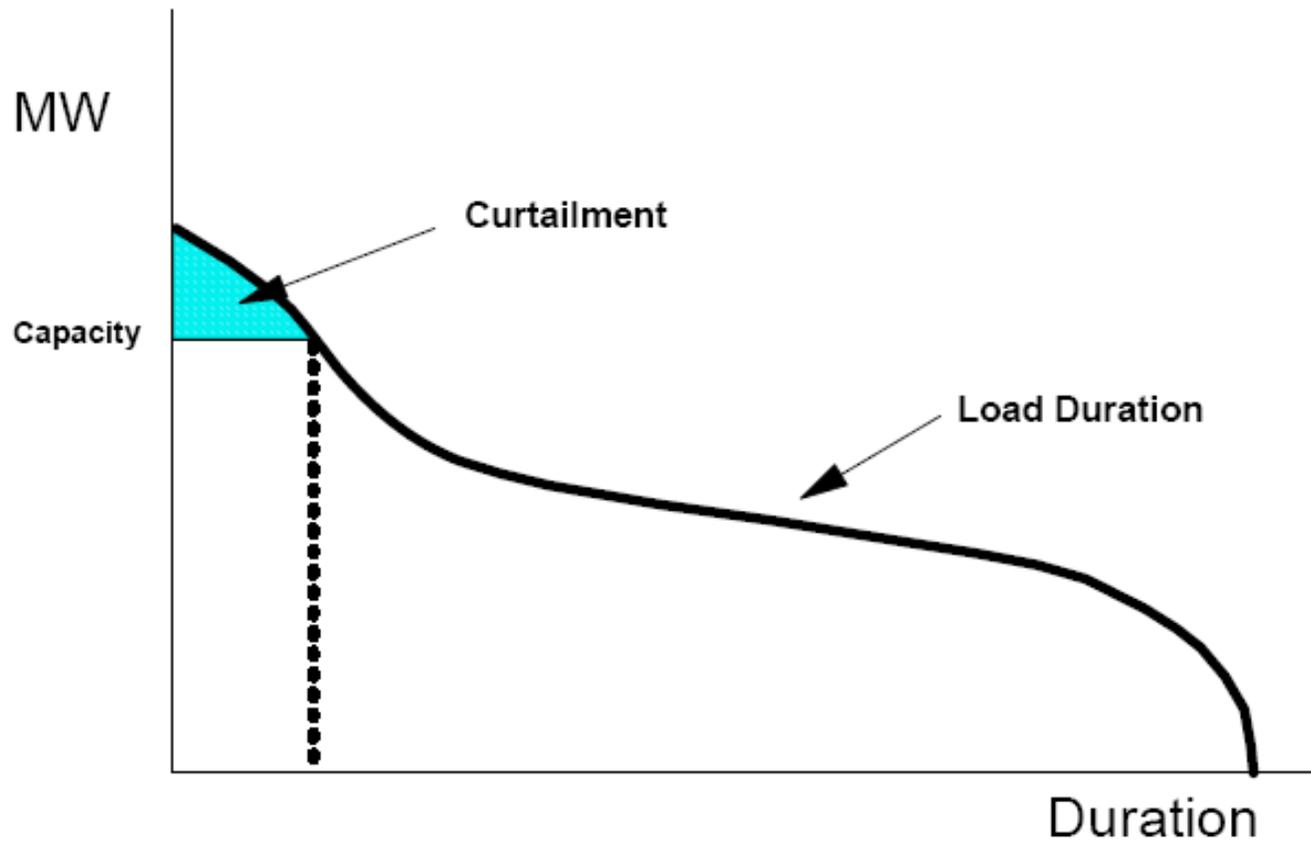
MISO Wind Integration Update: Dispatchable Intermittent Resource (DIR)

- Still in development – MISO to make filing to FERC before the end of this year
- Elements of the Current DIR Proposal
 - Market registration as a DIR required for all intermittent resources (except those in operation prior to 4/1/05)
 - Forecast requirements
 - Two year transition before registration required
 - Will allow for full participation in the Energy and operating reserves market (vs. Energy only)
 - Market settlements for DIR identical to generation resources, including RSG



Resource Adequacy

A Simple Reliability Model





MISO Wind Integration Update: Resource Adequacy

- Capacity credit for wind generation at MISO
 - 2009 MISO credited wind resources with 20% of its nameplate capacity
 - 2010 MISO is crediting wind resources with only 8% of its nameplate capacity
 - Based upon actual wind generation performance in MISO at peak and statistics. See MISO 2010 LOLE Report: http://www.midwestmarket.org/publish/Document/13b9ea_1265d1d192a_-7b910a48324a/2010%20LOLEWG%20Study%20Report.pdf?action=download&_property=Attachment
- Potential changes to MISO capacity constructs (Investigating forward capacity market)
 - MISO to make FERC filing prior to the end of 2010



Thank You!

Questions?

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