Delivering the Wind: Transmission and Interconnection Issues and Challenges

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Introduction

• ISO-NE Interconnection Process
• What you can (and can’t) learn from your interconnection studies
• Other ways to evaluate deliverability
• Market developments
• Regional transmission planning and funding
ISO-NE Interconnection Process Overview

• Interconnection Request
  – $ 50k deposit
• Entry into Interconnection Queue
• Scoping Meeting
• Studies done serially in queue order to determine required upgrades and cost responsibility
ISO-NE Interconnection Process Overview

• Feasibility Study
  – Optional, recommended
  – $95k avg cost in 2010

• System Impact Study
  – Required
  – $121k avg cost in 2010

• Facilities Study
  – Optional, rarely done
  – $5k - $150k historically
• Interconnection Agreement
  – Deposit of 20% of upgrade cost due after signing unless all major permits in hand
• Timeline specified in Tariff with limited ability to delay between major steps
• Despite timeline in Tariff, whole process takes 2.3 years on average (2010 data)
• Renewable Energy New England (RENEW) working with ISO to improve wind interconnection process. To learn more: http://renew-ne.org/?page_id=306
What Do Interconnection Studies Tell You?

• Minimum cost, upgrades to connect
• Whether a planned reliability upgrade will reduce interconnection costs
• After interconnecting you will be able to compete in the energy markets to sell power
What Don’t Interconnection Studies Tell You?

- All system conditions under which you will or won’t be able to operate
- How much competition you may face for existing transmission capacity
- How much curtailment you might expect
What About the FCM Overlapping Impact Study?

• To sell capacity in the Forward Capacity Market, must pass the overlapping impact test
• Can request a preliminary analysis of potential upgrade requirements to pass the overlapping impact test during Feasibility Study
• Assumes all wind plants producing at summer capacity values (about 22% of nameplate)
• Does not ensure concurrent deliverability at higher wind output, low loads, or while non-FCM resources are operating
What Other Options Are There?

- With system knowledge, can sometimes identify deliverability challenges and solutions before beginning studies
- With detailed simulations of the system under varying conditions, can identify more precisely
- ISO Elective Transmission Upgrade
  - Can specify operating assumptions, deliverability goal
  - Study should identify upgrades required
  - Upgrades are customer-funded
  - No priority access to use transmission once built
How the Markets Enable or Constrain Wind Deliverability

- Under constrained conditions, generators with Day Ahead Market positions have priority
  - Intermittents with FCM obligation are the only resources not required to offer in the DAM

- Centralized Wind Forecasting
  - Will launch in Q1 2013

- Wind Real Time Dispatch, Negative Energy Pricing
  - Under development, expected 2014 or 2015
How Regional Transmission Upgrades Get Planned and Funded

- **Reliability Upgrades**
  - Planned to meet reliability criteria for bulk electric system (BES)
  - $5 billion built since 2002

- **Market Efficiency Transmission Upgrades**
  - Designed to reduce total production cost for supplying load
  - Not used to date

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**Cost Allocation**
(Based on 2011 Load Share)

- MA
- CT
- NH
- ME
- VT
- RI
How Regional Transmission Upgrades Get Planned and Funded

• Order 1000 Public Policy Upgrades
  – Planning process must consider transmission needs driven by public policy requirements
  – Cost allocation methodology still under consideration (state opt-in?)
  – Compliance filings due in October
Questions?

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