

firstwind®

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# NECPUC SYMPOSIUM

Value of the Integrated Grid  
June 17, 2014

## DISCLAIMER

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Comments are my own and do not necessarily represent the views of First Wind, its management or ownership.



# INTRODUCTION TO FIRST WIND

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# First Wind Introduction

## What We Do: *Clean Energy. Made Here.*

First Wind develops renewable energy projects and delivers clean energy throughout the U.S.

First Wind's customers include large energy utilities, municipal electric companies, and institutional off-takers. First Wind is committed to environmental stewardship and community outreach at every stage of project development and facility operations.

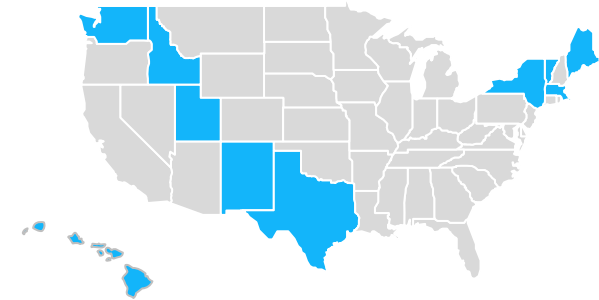
### Quick Facts<sup>1</sup>

- **200+** employees
- Operations in **10** U.S. states
- **1 GW** developed, built and operating
- **2,000+ GWh** delivered to customers in 2013
- **1.3 million** tons of CO<sub>2</sub> emissions avoided by 2013 generation<sup>2</sup>
- **\$523k** provided in community and charitable funding in 2013

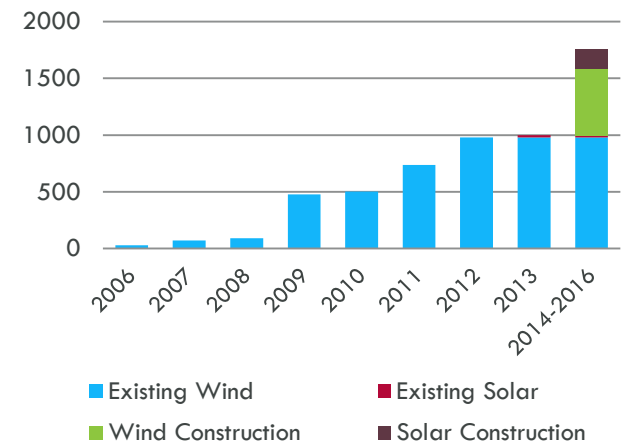
<sup>1</sup>Through 2Q 2014

<sup>2</sup>U.S. average of 1,293 lbs CO<sub>2</sub> emission per MWh, EPA EGRID 2010

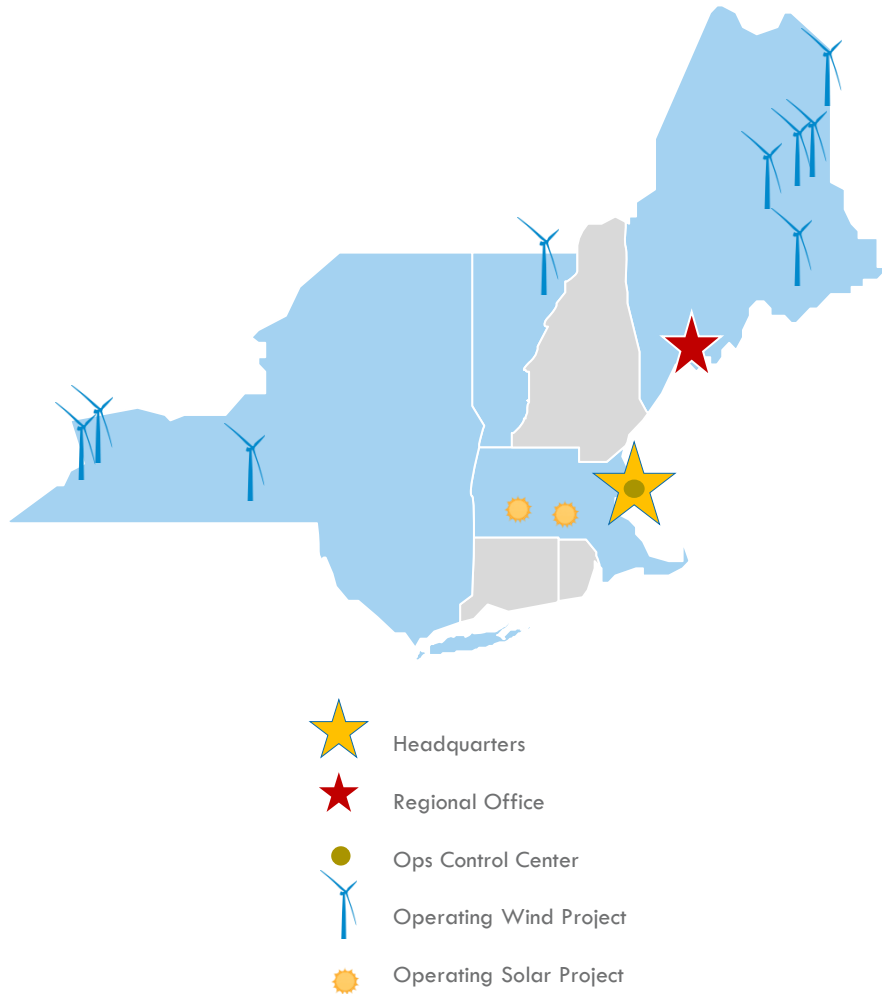
### Facility Locations



### Portfolio and Pipeline (MWs)



# First Wind: Anchored in New England



## A Local Partner

- Headquartered in Boston with regional office in Portland, ME and ~100 New England employees
- Developed first modern utility scale wind project in New England: Mars Hill
- 6 wind (259 MW) and 2 solar projects (17 MW ac) operating in New England, plus 3 wind projects in NY
- Emera Energy owns a 49% interest in the operating wind facilities in ME, VT, and NY.
- 148 MW of wind currently under construction in Oakfield, ME
- >1,500 MW in NE development pipeline, including projects that are construction-ready or in the permitting process



# CHALLENGES TO INTEGRATING RENEWABLE RESOURCES A DEVELOPER'S PERSPECTIVE

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# Challenges to Integration : A Developer's Perspective

The Grid is evolving:

- Generation becoming more remote and more distributed
- Demand becoming more responsive.

Market Rules and Processes for System Planning & Interconnection need to evolve to match needs of evolving Grid, but often not keeping pace . . .

## Not keeping pace has Consequences

Not keeping pace has adverse consequences for consumers, for generators and generation developers, and for achieving public policy goals.

Two Examples:

- Renewable Energy Curtailments
- Variable Resources still not integrated into wholesale economic dispatch

# Challenges to Integration : Examples

Two Examples:

- Renewable Energy Curtailments
  - Current Transmission Planning for system reliability does not offer solutions –
    - Largely not replacing benefits provided by aging and retiring generation, e.g., inertia
    - Does not assess economic and public policy benefits at a practical level
    - Imposes costs of emerging system deficiencies on generation developers
  - Generator & Elective Transmission Interconnection Processes
    - Long and Expensive
    - Does not identify Curtailment risks
    - Not designed to identify optimal or “right size” solutions (bring me a rock analogy)
- Variable Resources NOT integrated into wholesale economic dispatch
  - Cannot submit price based offers
  - Gives competitive advantage to other resources



# Ratepayer Cost of Keene Road Curtailment

- Recent ISO-NE economic studies have shown that wind and hydro provide large ratepayer savings across ISO-NE through energy price suppression
  - Effects of wind and hydro are analyzed in 2011 and 2013 Economic Studies
  - Curtailment reduces price suppression, resulting in increased ratepayer cost
- An extrapolation from the ISO-NE Economic Study\* suggests that wind curtailment at Keene Rd alone may have cost New England ratepayers more than \$17 million over a 16 month time period.

	FCA5	Active Queue		Report
	Case	Case	Change	Page #
New England Wind Generation, GWh	2,510	11,565	9,055	79
New England Ratepayer Energy Cost, \$M	\$7,955	\$6,881	-\$1,074	78
"Production Cost", \$M	\$3,800	\$3,354	-\$446	78
Keene Rd Wind Curtailment Jan 2012 - Apr 2014, GWh			150	
Estimated Ratepayer Cost, \$M			<b>\$17.8</b>	
Estimated Increase in "Production Cost", \$M			\$7.4	

- Assuming pro-rata treatment, hydro curtailment at Keene Rd is likely to have a similar additional effect

Curtailment Adversely Impacts Ratepayers Across ISO-NE

\* ISO-NE 2011 Economic Study Final Report, 3/31/2014

# Solving Challenges – Hope on the Horizon

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## ➤ Markets

- Wind Integration coming – 2015?
- Overlapping Impacts – more problematic – may require regulatory action

## ➤ Transmission Constraints

- ISO opening stakeholder discussions on Generator Interconnection and Elective Transmission Upgrade processes
- FERC Order 1000 incorporates “public policy” in transmission planning

## ➤ But . . . a lot more work to be done. Need to start now!



QUESTIONS?

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