

# Connecticut IRP



## Regional Renewable Resource Development Efforts

New England States Committee on Electricity  
September 2011

# OVERVIEW

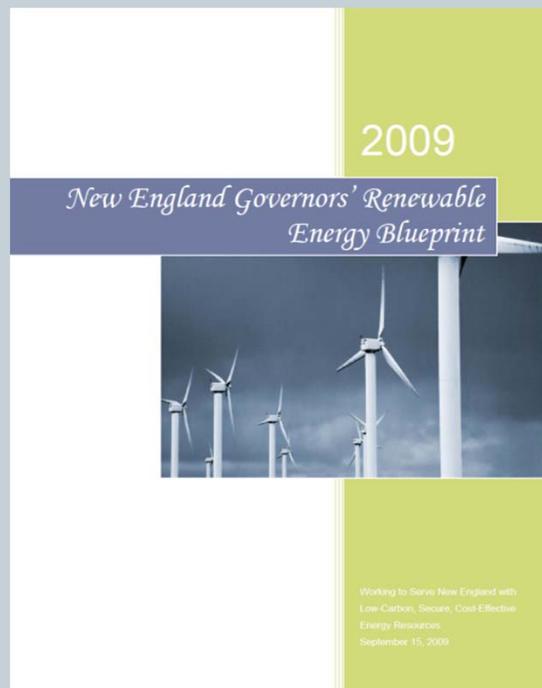
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- **The Point:** Exploring means to help meet renewable energy goals at **lowest ‘all-in’ delivered cost**
- **Quick Look Back:** 2009 *New England Governors’ Renewable Blueprint*, 2010 *Report on Coordinated Procurement*, 2011 *RFI*
- **Current:** Supply Curve Analysis

# 2009: Governors' Renewable Energy Blueprint

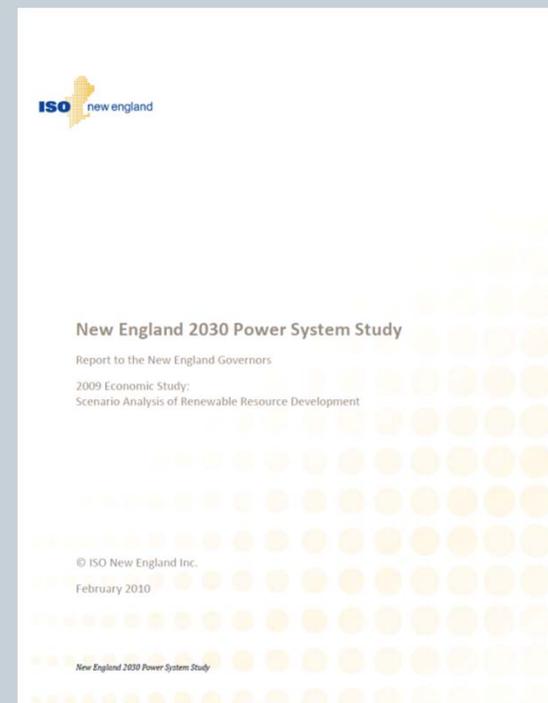
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## Policy



**Governors' Renewable Energy Blueprint**

## Technical Analysis



**ISO-NE Renewable Development Scenario Analysis**

# Connecting Wind Energy to Load Centers

Slide Courtesy ISO-NE

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- Population & electricity demand concentrated along coast
- ISO identified 12,000 MW of on & off-shore wind potential

Preliminary screening eliminated wind sites near urban & sensitive geographic locations

(renewables in queue at the time of the study was approximately 3,700 MW)

- Transmission required to connect potential wind resources to load centers in New England



# Scenario Examples

Slide, Courtesy ISO-NE

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<b>Description</b> <i>Partial list of scenarios</i>	<b>New Capacity</b> (Megawatts)	<b>Percent of New England Energy (%)</b>	<b>Preliminary Transmission Cost Estimates</b>
<b><i>From New England:</i></b>			
4,000 MW of offshore wind <i>plus</i> 1,500 MW of inland wind	5,500 MW	12%	\$6 B
12,000 MW of wind	12,000 MW	23%	\$19 B to \$25 B
<b><i>From New England and Eastern Canada:</i></b>			
5,500 MW of wind (from above) <i>plus</i> 3,000 MW of additional imports from Québec and New Brunswick*	8,500 MW	15%	\$10 B
12,000 MW of New England wind <i>plus</i> 3,000 MW of additional imports from Québec and New Brunswick*	15,000 MW	26%	\$23 B to \$29 B

\*Estimate does not include facilities in Québec and New Brunswick; only includes cost of potential transmission in New England.

# Blueprint *Technical* Conclusions: Ample Resources, Choices

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## The New England Region has ...

- **vast** quantity of **untapped renewable resources**: more than 10,000 MW on & off-shore wind power potential

## If developed conservatively...

- there are **ample** renewable resources to enable New England **to meet renewable energy goals**

## If developed aggressively...

- **New England could export** renewable power to neighboring regions

# Blueprint *Policy* Conclusions: Facilitation Opportunities

New England states have...



**Cooperative experience, inclination to do more**



**Siting processes that could accommodate some degree of coordination**



**Long-term contract approval mechanisms**

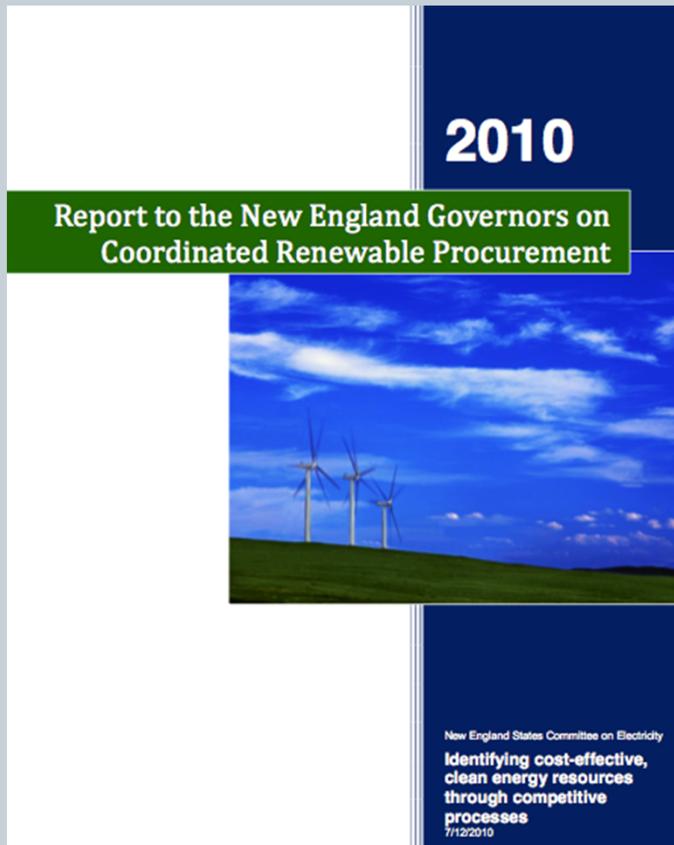


**Common Contract Themes:**

**Competitive Processes & Interest In Securing Low Cost, Cost-effective, Or Cost Stabilizing Power**

# 2010: Report to the New England Governors Coordinated Renewable Procurement

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- Assessed New England states' power procurement practices, processes, looked for coordination opportunities
- Preliminary information about potential mechanisms to coordinate competitive procurement of renewable resources
- Identifies some potential terms & conditions & possible regulatory approval process approaches concerning renewable procurement
- [http://www.nescoe.com/uploads/Report\\_to\\_the\\_Governors\\_July\\_2010.pdf](http://www.nescoe.com/uploads/Report_to_the_Governors_July_2010.pdf)

# Coordinated Procurement Could ...

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“... **aggregate demand** for renewable power and **enhance buying power**; **stimulate the market** for renewable resources; and, provide value to renewable project developers by **creating larger revenue streams** than might otherwise be possible. Using cooperative competitive processes may, therefore, facilitate development of cost-effective, low-carbon renewable electric generation in and around the region.” Report at 5.

*And yes... “Large-scale renewable power procurement is complex and coordinating across EDC territories and state lines increases the complexity substantially.” Report at 24.*

## 2011: Renewable *Request for Information*

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**RFI:** Market inquiry about resources with potential to help meet renewable energy goals at ***lowest 'all-in' delivered cost*** & for which a coordinated competitive procurement process could facilitate commercial development [http://www.nescoe.com/Coordinated\\_Procurement.html](http://www.nescoe.com/Coordinated_Procurement.html)

### **Criteria:**

- *New resources*
- *Deliverable to New England loads*
- *Operational by 2016 and*
- *Eligible for all 5 New England states' RPS and VT's renewable goals (wind, solar, landfill gas, small hydro & biomass)*
- *Other: sought information from transmission developers on transmission that could facilitate delivery*



# Renewable RFI: Generation Responses

## Highlights:

- 4,700 MW by 2016
- 90% wind on & off shore
- 50+% Maine on-shore wind

Technology	Within New England						Outside of New England	Total
	CT	MA	ME	NH	RI	VT		
Biomass	82.0	137.3	30.0				1.6	249.3
Landfill gas		1.6						3.2
Small Hydro			3.0					3.0
Solar	4.0	27.0						31.0
Wind - on-shore		4.0	2519.3	351.0			584.5	3458.8
Wind - off-shore			30.0		1000.0			1030.0
<b>Total</b>	<b>86.0</b>	<b>169.9</b>	<b>2582.3</b>	<b>351.0</b>	<b>1000.0</b>		<b>586.1</b>	<b>4775.2</b>

Technology	Year of initial commercial operation						Total
	2011	2012	2013	2014	2015	2016	
Biomass	46.4	0.9	77.0	30.0	55.0	40.0	249.3
Landfill gas	1.6		1.6				3.2
Small Hydro	3.0						3.0
Solar		17.0			14.0		31.0
Wind - on-shore	20.0	586.3	413.5	481.0	1643.0	315.0	3458.8
Wind - off-shore					1030.0		1030.0
<b>Total</b>	<b>71.0</b>	<b>604.2</b>	<b>492.1</b>	<b>511.0</b>	<b>2742.0</b>	<b>355.0</b>	<b>4775.2</b>

# Renewable RFI: Transmission Responses

## Highlights:

- 1 off-shore
- 1 NY-VT upgrade
- 5 Maine to load, generally consistent with generator submissions

Project Number	Description	Miles of New Transmission	Technology	Capacity (MWs)
1	Off-shore transmission system to deliver energy from off-shore wind turbines to loads in southern New England	Not specified	Not specified	Up to 4000 MW, in 1000 MW increments
2	Interconnection between upstate NY and northern VT	Not specified	230 or 345 kV interconnection points	600
3	Connection from Maine Public Service Company transmission system to CMP transmission system	~26	345 kV AC line within Maine	200+ (at least 200 MW of wind projects have been identified)
4	HVDC link between northern Maine and downtown Boston	~300	HVDC overhead line and submarine cable	800
5	Transmission upgrades in western Maine	Not specified	115 and/or 345 kV AC lines	Up to 1100
6	HVDC link between central Maine and northern Massachusetts	230	HVDC underground line	1100 (with potential for some additional increase on existing lines)
7	AC transmission upgrades between Maine and southern New England	Unknown	Unknown	1000-2000

# Most Recently

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In July 2011, New England Governors, by Resolution, expressed continued interest in exploring coordinated procurement

**States interested in understanding broadly indicative costs for:**

- ✦ **Resources that could supply renewable energy to New England**  
*Plus*
- ✦ **Transmission projects that could integrate those projects**

**indicative cost information  $\neq$  resource plan**

# Today, Developing *Broadly Indicative* Cost Information

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## **Generation (Sustainable Energy Advantages)**

- ✦ Developing **cost estimates for renewable resources – on & off shore wind** - that could supply energy to New England
- ✦ Independently estimate resource potential to yield “renewable supply curve” for 2 study years - **2016 & 2020**
- ✦ Initial focus on wind potential in **New England & NY**

## **Transmission (RLC Engineering)**

- ✦ Developing **cost estimates for transmission** that could help integrate energy from such projects
- ✦ Initial focus on transmission options in **northern New England**

# This Is Not A Plan

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## What analysis will **not** indicate:

- ✦ A best or preferred set of generation or transmission projects

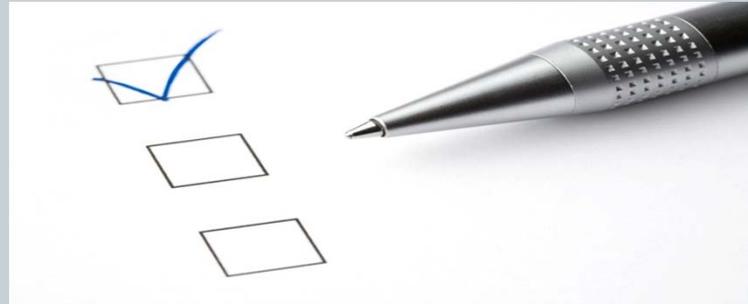


## What analysis will indicate:

- ✦ Relative costs of various wind resources in New England, NY – on & off shore
- ✦ Cost of transmission to interconnect on-shore wind in northern New England

# NEXT STEP

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- ✦ Evaluate SEA, RLC analysis
- ✦ Post final analysis – expect Q4 2011; welcome comment
- ✦ Consider Next Steps

# Interstate Siting Collaborative

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**New England does not have a siting problem to solve – we’ve sited \$4 B since 2002, with more than that on horizon**

However, the Blueprint identified that coordinating siting could help facilitate development of renewable & other resources

Looking at coordination opportunities possible under **current law**

1<sup>st</sup> Step: **Listening** to New England’s transmission owners & developers to identify **what the states could do better in the short & long term**



# Thanks.

More Information:  
[www.nescoe.com](http://www.nescoe.com)

Follow us on Facebook: <https://www.facebook.com/pages/New-England-States-Committee-on-Electricity/100576639985710>