Perspectives on Transmission Needs

Philip Giudice
Commissioner
Department of Energy Resources

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Transmission Perspectives

- The grid that powers the tools of modern life -- computers, appliances, even BlackBerrys -- looks largely the same as it did half a century ago.”

President Barack Obama
(DOE Secretary Chu quoted 9-21-2009)

- “We need an interstate transmission superhighway system,”

Suedeen G. Kelly, FERC (NYT 8-27-2008)

- “We are a major superpower with a third-world electrical grid," “Our grid is antiquated. It needs serious modernization."

Gov. Bill Richardson, New Mexico, former DOE Secretary
(NYT 8 14-2003)
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Transmission Capital Spend

Source: EEI 2009; 2005
Utility of Transmission

Desired Outcomes
1. Improve reliability
2. Reduce electricity customers costs
3. Reduce carbon emissions

→ transmission: no unique ability to provide any desired outcome; only a portion of value chain

Formidable Challenges
1. Who pays? cost and disruption
2. Who benefits?
3. Who’s in charge?

Search for simple solutions → new new things
Blue - high wind potential, Red - large demand centers, and Green - little wind and smaller demand centers.
Does the U.S. require an Extra High Voltage Grid?
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Figure 1-10. Conceptual transmission plan to accommodate 400 GW of wind energy (AEP 2007)

Wind Power Classification

<table>
<thead>
<tr>
<th>Wind Power Class</th>
<th>Resource Potential</th>
<th>Wind Power Density at 50 m</th>
<th>Wind Speed at 50 m</th>
<th>Wind Speed at 100 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Poor</td>
<td>100 - 200</td>
<td>5.0 - 6.0</td>
<td>12.0 - 14.0</td>
</tr>
<tr>
<td>4</td>
<td>Good</td>
<td>200 - 400</td>
<td>6.0 - 7.0</td>
<td>14.0 - 16.0</td>
</tr>
<tr>
<td>5</td>
<td>Excellent</td>
<td>400 - 600</td>
<td>7.0 - 8.0</td>
<td>16.0 - 18.0</td>
</tr>
<tr>
<td>6</td>
<td>Outstanding</td>
<td>600 - 800</td>
<td>8.0 - 9.0</td>
<td>18.0 - 20.0</td>
</tr>
<tr>
<td>7</td>
<td>Superb</td>
<td>800 - 1600</td>
<td>9.0 - 11.0</td>
<td>20.0 - 22.0</td>
</tr>
</tbody>
</table>

* Wind speeds are based on a wind vane value of 1.2.
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RPS meeting targets

Source: DOER
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New England RPS Projections

*R% of cumulative energy from queue additions
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Meeting Peak Demand

15% of Capacity for 1% of Hours

Source: ISO NE 2007 NEMA load zone
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DR Significant Resource

 demand-resource enrollments

ISO NE 2009
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Increasingly Peaked

Annual Load Factor

Year

Percent


68 64 62 60 58 56 54 52
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Few High Priced Hours

$ per MWh

Source: ISO NE
MA DOER Mission

Creating a Greener Energy Future
-- economically and environmentally, including:
  - Achieving all cost-effective energy efficiencies,
  - Maximizing development of greener energy resources,
  - Creating and leading implementation of energy strategies to assure reliable supplies and improve relative cost, and
  - Supporting clean tech companies and spurring clean energy employment.
Many Policy Levers

Executive
- LBE
- Decoupling
- RGGI
- Renewables
  - PV: 250 MW 2017
  - Wind: 2000 MW 2020
- ZNEB
- Governor’s Energy Challenge
- MEPA

Legislation
- Green Jobs
- Ocean Management
- Clean Energy Biofuel
- Global Warming
- Green Communities
  - Building Codes
  - Smart Grid Pilot
  - Least cost Procurement
  - Communities
  - Renewables
  - Stimulus
Very high electric prices

2007 Retail Electric Price
(Cents per kWh)

Source: EIA Form 826
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High Energy Productivity

Source: EIA/Census 2005
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Reducing Energy Waste

- Energy Efficiency Delivered
- Generation delivered by Investor-Owned Utilities

Graph showing trends from 1991 to 2011.
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Closing thoughts

- Our greener energy future:
  - Getting this right matters
  - Getting it done soon matters
  - Getting it done big matters

- Lots of policy levers need to be pulled in coordination – no simple solutions

- One size does not fit all parts of the country

- States’ roles are critical to creating solutions that work - not road block to overcome

- Regions can work collaboratively

- Market solutions are delivering success