“The Nation’s infrastructure crisis is no less serious for being silent. [Fixing it] will improve our quality of life, our standard of living and our competitiveness.” (Warren Rudman and Felix Rohatyn, 2005)

• “FERC Commissioner: Transmission is the ultimate enabler,” 2/13
• “Investment in transmission still hinges on sector stability,” 3/13
• “Creativity key as grid planners confront changing technologies, politics,” 10/13
• “Pepco exec: Industry dealing with ‘unintended consequences’ from Order 1000,” 11/13
• “PSEG earnings growth driven by transmission investment – CEO,” 10/13
• “Companies unplug from the grid, delivering a jolt to utilities,” 10/13
“Too Soon Old and Too Late Smart”

- Aging and deteriorating transmission infrastructure
- More dispersed sources of generation
- Complex bulk power markets; Congestion
- Wholesale competition among generators
- Arrival of digital technologies
- Electricity demand will grow 30+% by 2035
- Challenges to reliability
Investment: Better Late than Never

[1]: Circuit miles of overhead electric lines from EEI's Historical Statistical Yearbook. Data excludes REA cooperatives.
[2]: Courtesy of the North American Electric Reliability Corporation. NERC data is only available for lines 200kV and above. Note: transmission line additions are calculated as the difference in existing transmission between the current and prior year (i.e. 2003 additions = 2003 miles - 2002 miles).
[3]: Ventyx Suite.
Projected CapEx By Function

<table>
<thead>
<tr>
<th>Year</th>
<th>Total CapEx</th>
<th>Generation</th>
<th>Distribution</th>
<th>Transmission</th>
<th>Gas-Related</th>
<th>Environment</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012P</td>
<td>$94.4 B</td>
<td>41%</td>
<td></td>
<td></td>
<td>22%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>2013P</td>
<td>$95.2 B</td>
<td>37%</td>
<td></td>
<td></td>
<td>21%</td>
<td>17%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Notes: Total company functional spending of U.S. Shareholder-Owned Electric Utilities. Projections based on publicly available information and extrapolated for companies not reporting functional detail (1.6%).

Source: EEI Finance Department, company reports (October 2013)
Principal Drivers of New Transmission

Reported Drivers of Projected Circuit-Miles of Transmission Additions
(2011-2015 as reported voluntarily to NERC and in EIA Form 411 by IOUs, coop/munis, state/federal power agencies, ISOs/RTOs, and merchant developers)

By Driver
- Renewable Integration: 26%
- Economics: 13%
- Generation Interconnection: 3%
- Reliability: 48%
- Other: 10%

By Voltage
- 100-199 kV: 16%
- ≥400 kV: 33%
- 200-299 kV: 17%
- 300-399 kV: 34%

Total 2011-2015: 22,669 circuit-miles

Sources and notes:
Based on drivers as report in EIA Form 411. No adjustments have been made to projects in one category (e.g., reliability) which may ultimately be built to satisfy more than one driver (e.g., renewable integration).
Barriers to Transmission – Infrastructure Development

• Lack of established regional and inter-regional transmission planning processes
• Unresolved cost allocation and recovery for multi-state and inter-regional projects
• Largely uncoordinated and uncertain state-by-state permitting & state public policy requirements
• Uncertainty surrounding returns on investment
• Transmission gets pitted against DG, DR, EE
• Lack of coherent national infrastructure policy
FERC’s Order No. 1000

- **What The Order Is And Is Not**
  - A Revolution? A Tempest in a Teapot?
  - FERC Approach: Invite Lots of Cooks Into the Kitchen
  - Compliance Will Be a Slow, Multi-Layered Process
  - The Law of Planning and Cost Allocation Will Evolve Regionally; Interregional planning Will Be Toughest
  - FERC’s Initiative Is a Logical Next Step in a 20 Year Restructuring Process (So Far)
  - Notable Innovations: Public Policy Projects; Eliminating federal ROFRs; Consideration of NTAs

- **Where Does Implementation Stand Today?**
Transmission Cost Allocation

• How should projects be categorized for purposes of cost allocation and recovery?
• What factors, including “public policy,” should drive allocation of costs?
• How deferential to regional stakeholder preferences and cost allocation methodologies should FERC be?
• If Transmission costs are incurred by incumbent utilities versus independent developers, should the costs be allocated differently?
Benefits of New Transmission Investment

• Enhanced Reliability & Resilience
• Fuel Diversity; access to cheaper power
• Implementation of 30+ state renewable portfolio standards
• Reduced transmission congestion and generation costs
• Increased system reliability; operational benefits; “insurance” benefits
• Reduced system-wide production costs
• Increased electricity market competition and liquidity
• Reduced emissions and fossil fuel consumption
• Tax benefits to states and local jurisdictions
• Jobs and Economic Stimulus
Prognosis

• Amer. Society of Civil Engineers -- D+ for infrastructure
• Transmission investments still ‘lumpy.’ Tied to regional preferences, changing generation mix, regulatory risk, and smart technologies, not demand growth
• Hot topics -- ROEs, extreme weather, non-transmission alternatives; siting across federal lands, state ROFRs
• Coakley v. Bangor Hydro decision and a policy clarification expected 2014
• Order No. 1000: a long and difficult road to uncertain (potentially positive) results
• Regulatory harmonization not on horizon; state regulation is both as a barrier and an opportunity
• Electricity no longer flows ‘downhill’; challenges to utility business model threatens 30-year capital investments; rate base may grow faster than demand, increasing pressure on rates, earnings volatility, and cost recovery risks
• Incumbency remains powerful in transmission; emerging transcos and joint ventures provide development capital, regional presence, expertise
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