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Transmission Development – Key Issues to Watch

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Introduction

- **Recent data suggest that spending on transmission infrastructure will be strong over the next decade. Anticipated investment for transmission projects scheduled to be completed by the end of 2023 is $74B**
- **While the numbers suggest continued growth in transmission, there are various factors that will impact whether those projections come to fruition. Broadly, these trends can be placed into three categories:**
  - Driving forces, including:
    - Changing generation mix
    - Aging infrastructure
  - Restraining forces, including:
    - Declining demand growth
    - Challenges to the transmission ROEs
  - Complicating factors, including
    - Demand response and energy efficiency
    - Distributed generation
    - Electric and gas convergence

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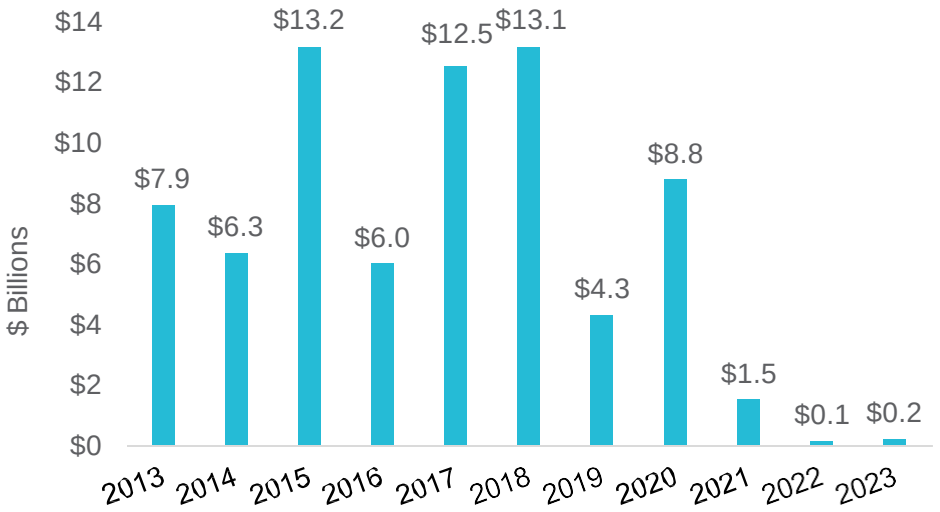
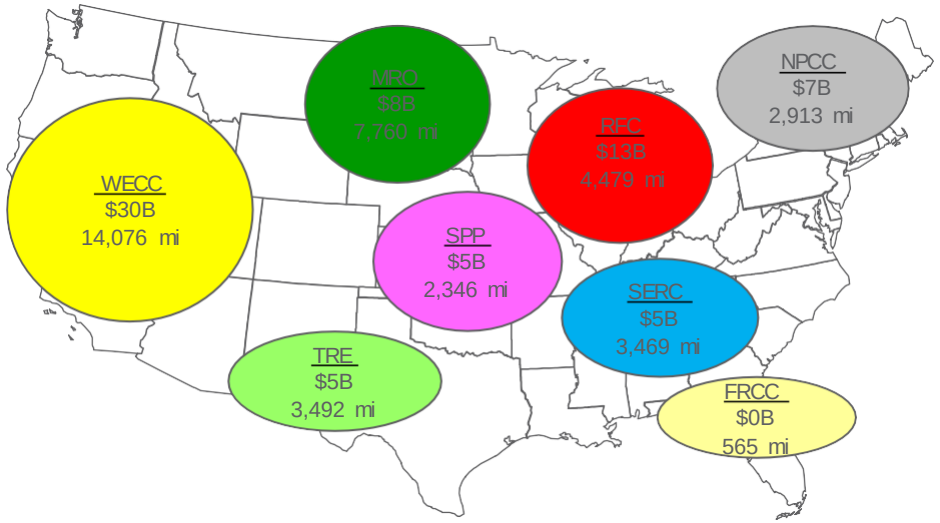
Investments in U.S. Transmission, 2013–2023

- According to recent SNL data, total in-service costs for transmission projects to be completed in the United States by 2023 are projected to be $74B
- These investments are projected to result in 39,100 new transmission line miles
  - More than 28,000 of these line miles are scheduled to be in service by 2018
- The amount of transmission planned varies significantly across the regions of the United States, as do the drivers of that investment

Total In-Service Cost of U.S. Transmission Projects



Total In-Service Cost of U.S. Transmission Projects by NERC Region, 2013–2023



Sources: SNL data; ScottMadden analysis

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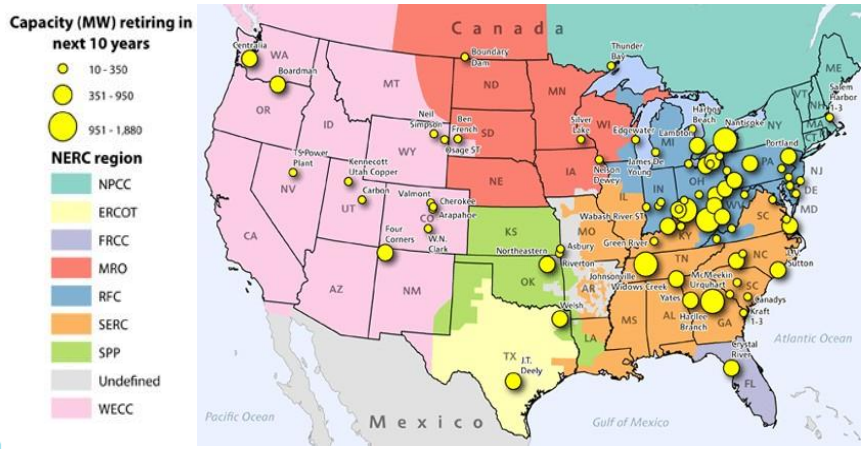
Changing Generation Mix

Coal Retirements/Shift to Gas

- **Approximately 71 GW of fossil-fired generation is projected to retire by 2022 (with more than 90% retiring by 2017) due to federal environmental regulations, low natural gas prices, and economics**
- **Several ISO/RTOs have identified transmission projects and/or expenditures specifically related to the transition away from coal**
  - In 2012, PJM authorized over $5B for more than 750 transmission improvement projects to ensure reliability as coal plants retire

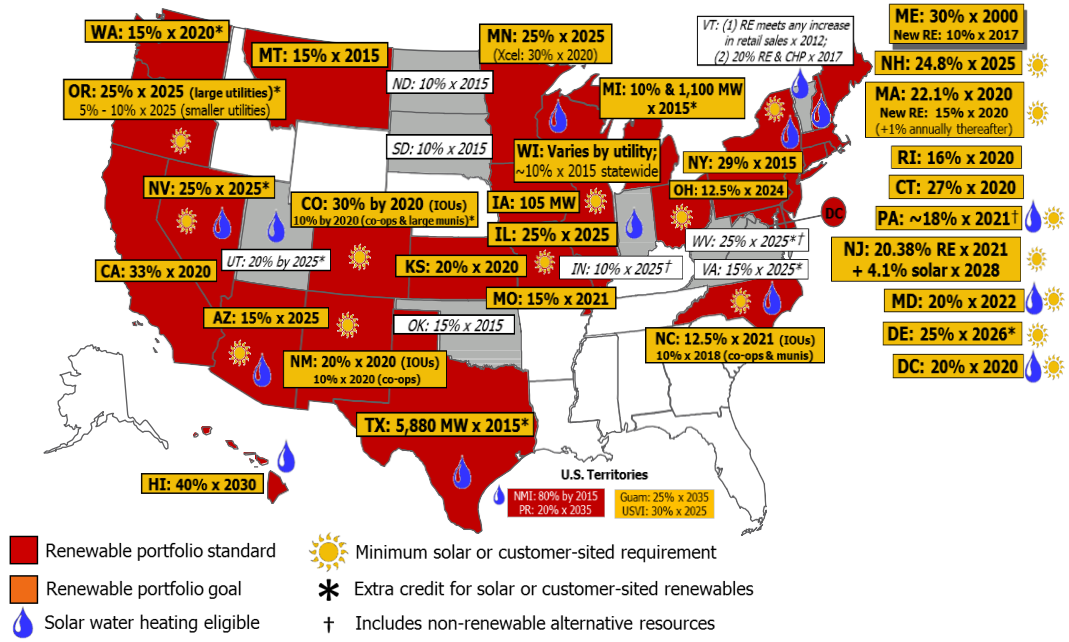
Planned Coal Capacity Retirements, 2013–2022



Renewables Integration

- **State RPS and federal incentives remain important drivers of transmission development**
- **In EEI's annual *Transmission Projects at a Glance*, of $51.1B in planned investment, 76% or $38.6B are related to the integration of renewables**

Renewable Portfolio Standard Policies (as of March 2013)



Sources: Platts; EE News; MISO EPA Impact Analysis; SNL Financial; Database of State Incentives for Renewables & Efficiency

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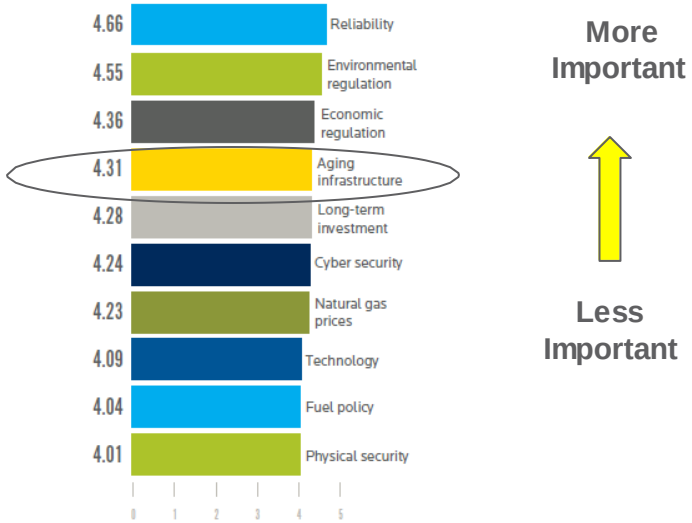
Aging Infrastructure and System Hardening

- Utilities are investing heavily to replace aging infrastructure and bolster existing infrastructure against the damaging effects of increasingly frequent extreme weather events
- In Black & Veatch's 2012 report, aging infrastructure was the most important issue for respondents
- In response to recent extreme weather events, utilities are investing in system hardening, and these investments are expected to be greatest in areas that have been hit particularly hard by recent events
- Aging infrastructure will not be addressed in isolation. Asset management programs and Smart Grid implementations will be part of the investment to address both reliability and resiliency challenges

Top Ten Industry Issues Facing Utilities in 2013



2011–2012 Extreme Events and Reported Customers Affected by Power Outages

Event	Date	Region, Division, or State	Customers Affected (in millions)
Superstorm Sandy	Oct 2012	Northeast	8.1
Derecho	July 2012	Middle Atlantic	4.2
Early season snow	Oct 2011	New England	3.0
Tropical Storm Irene	Aug 2011	Middle Atlantic	3.2
Wildfires	July 2012	California, Colorado	2.0
Windstorm	Nov 2011	Southern California	0.4

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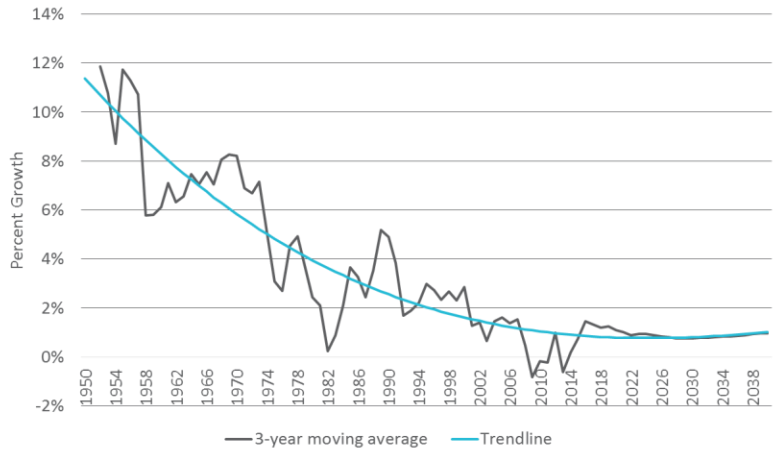
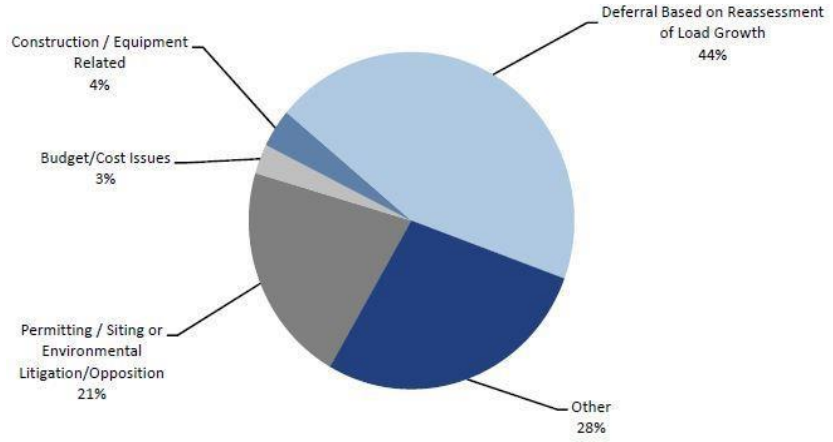
Declining Demand Growth

U.S. Demand Growth, 1950–2040



Reasons for Transmission Project Delays or Deferrals



- The Energy Information Administration (EIA) projects growth in demand in the United States to remain below 1% for the foreseeable future
- According to NERC's 2012 Long-Term Reliability Assessment, demand growth for the summer season was at its lowest level since 1967 when NERC began reporting data
- Reduced load-growth projections contribute to the postponement or cancellation of large transmission projects (i.e., MAPP and PATH in PJM)
- The proliferation of DSM and EE initiatives, coupled with expanding customer-side supply alternatives, will likely suppress demand growth for the foreseeable future

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Sources: EIA; NERC 2012 Long-Term Reliability Assessment

Challenges to ROEs

- In November of 2012, FERC reaffirmed and clarified its commitment to incentives in transmission and provided guidelines under which these would be considered
- In addition, scrutiny of ROEs has recently increased
- Intervenors have filed numerous Section 206 complaints with FERC requesting that authorized ROEs be reduced because the current rates are unjust and unreasonable
- Many intervenors believe transmission investment opportunities should reflect a "new normal" economy with lower interest rates and lower costs of capital. The Commission's decisions are pending
- We would expect this trend to continue as pressure on electric rates in general increases

Outstanding FERC Complaints		
Utilities	**Current (Proposed) ROE**	**Requested ROE**
Bangor Hydro-Electric, Central Maine Power, National Grid, NextEra, NSTAR, NE Utilities, CL&P, WMECO, PSC of NH, United Illuminating, Unitil, Vermont Transco	11.14%	9.20%
Florida Power (Progress Energy Florida)	10.80%	9.02%
Southwestern PSC	11.27%	9.65%
Cleco Power	10.50%	8.55%
PSC of Colorado	10.25%	9.15%
Maine PSC	10.50%	8.83%
Niagara Mohawk Power (National Grid)	11.50%[2]	9.49%[2]
Niagara Mohawk Power (NYISO)	11.50%[2]	9.25%[2]
Bangor Hydro-Electric, Central Maine Power, National Grid, NextEra, NSTAR, NE Utilities, CL&P, WMECO, PSC of NH, United Illuminating, Unitil, Vermont Transco	11.14%	8.7%
Baltimore Gas & Electric Company, Pepco Holdings, Delmarva Power & Light Company, Atlantic City Electric Company, Potomac Electric Power Company	10.8%[3] 11.3%[4]	8.7%
Pacific Gas and Electric Company	11.5%[2]	9.1%[1,2]
Southern California Edison Company	12.6%[5]	11.03%[1,5]

[1]Complaint filed during utility-initiated rate case proceeding
[2]Rate inclusive of 50bps adder
[3]Rate for projects before 2006
[4]Rate for projects after 2006
[5]Rate inclusive of 110bps adder

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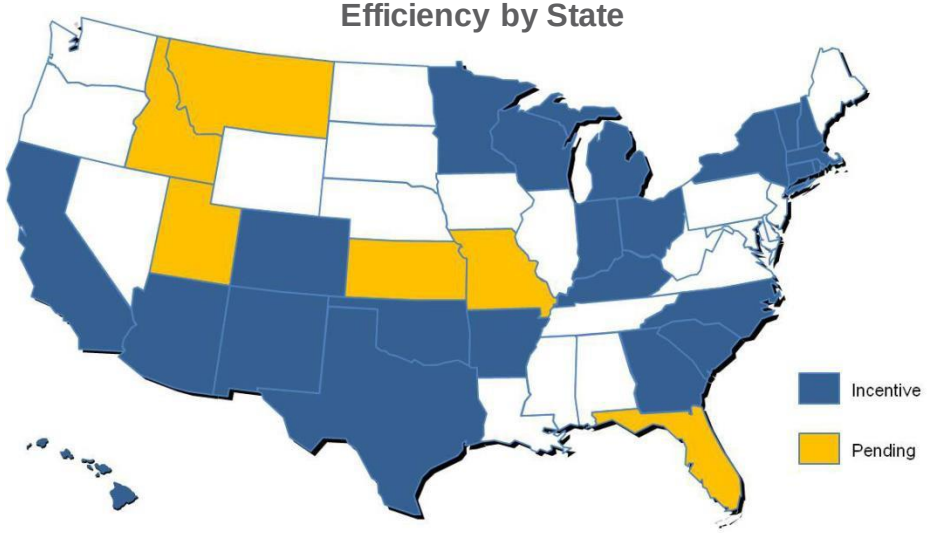
Complications…

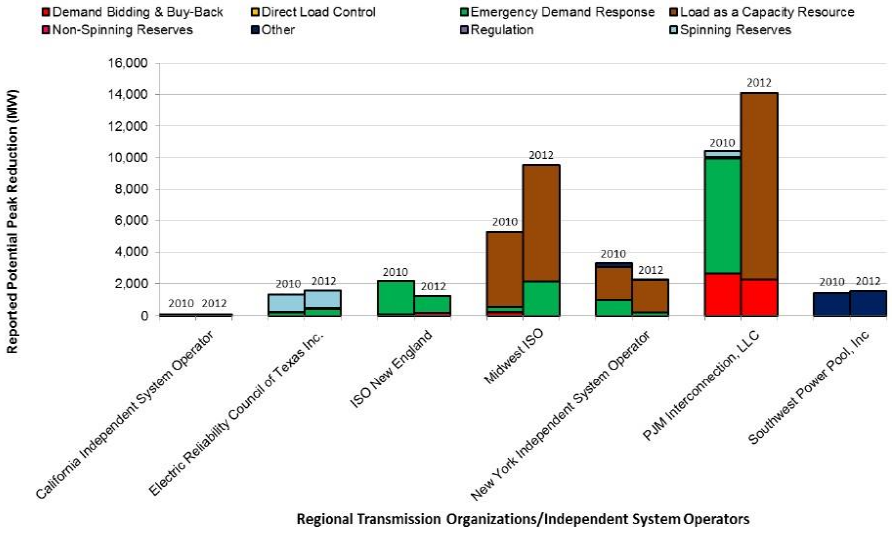
- Energy efficiency and demand response programs are reducing load and specifically peak load; more and more these are being relied upon as capacity resources
- Distributed generation and other customer self-supply options are reducing utility loads and making them less predictable
- These make planning and operating the transmission system more difficult

Performance Incentives for Electric Efficiency by State

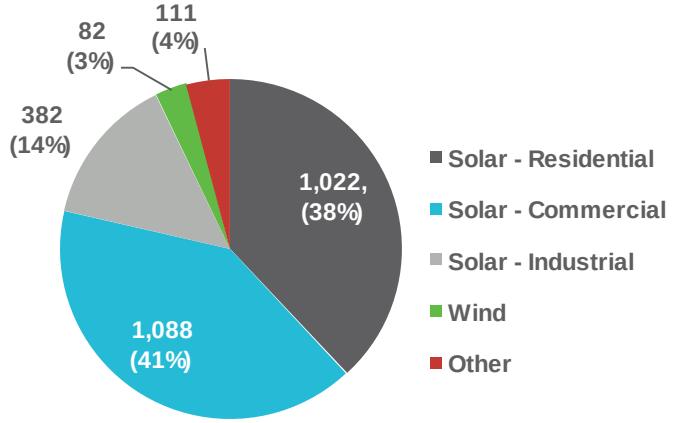


Source: IEE, State Electric Efficiency Regulatory Frameworks, 2012

Reported Potential Peak Reduction by ISOs and RTOs in 2010 and 2012



Net Metered Capacity (MW)



Sources: FERC, Assessment of Demand Response & Advanced Metering, December 2012; EIA, GTM Research, ScottMadden analysis

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Driving, Restraining, and Complicating Factors

The industry is in a unique position with certain factors favoring significant transmission development and others working against it. At a minimum, transmission planning, development, and operations will become even more complex in the years to come.

- Renewables integration
- Generation retirements
- Shift to gas-fired generation
- Aging infrastructure

- Economic malaise
- Declining demand growth
- Uncertainty about ROEs
- Rate pressure
- Siting and permitting

Complicating Factors

- Distributed generation
- Demand response
- Electric and gas convergence

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