Panel Discussion:

Opening Remarks

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Transmission expansion under way for utility-specific and regional reliability investments:

- $2b/year in 1990s
- $8b/year in 2008-09

NERC predicts investment (in mostly reliability and generation interconnection projects) to **triple** from about 1,000 miles/yr in 2000-08 to 3,000 miles/yr for 2009-2017

**Additional regional upgrades now driven by state renewables requirements**

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**Source:** The Brattle Group based on FERC Form 1 data compiled by Global Energy Decisions, Inc., The Velocity Suite.
We identified approx. 130 mostly conceptual and often overlapping projects (> $100 million each) for a total of over $180 billion. Many of these regional projects will not get realized due to:

- Overlaps with competing projects
- Planning and cost allocation challenge
- High costs

Large portion of these proposed projects are driven by large-scale renewables integration.

Source: Map from FERC. Project data collected by The Brattle Group from multiple sources and aggregated to the regional level.
State Renewable Portfolio Standards and Goals

29 states and D.C. have an RPS; 7 States and 3 Power Authorities have Goals

- WA: 15% by 2020
- OR: 25% by 2025
- NE Public Power Districts: 10% by 2020
- IA: 105 MW; 1 GW wind goal by 2010
- KS: 20% by 2020
- OK: 15% by 2015
- MN: 25% by 2025; 30% by 2020 — Xcel
- WI: 10% by 2015
- IL: 25% by 2025; wind 75% of RPS
- MO: 15% by 2021
- LA: 350 MW by 2012-13
- OH: 12.5% by 2025
- WV: 25% by 2025
- ME: 30% by 2010; 10% new by 2017; 8 GW wind goal by 2030
- NH: 23.8% by 2025
- VT: 20% by 2017; all growth to 2012 from RE and EE
- RI: 16% by end 2019
- CT: 27% by 2020
- NY: 30% by 2015
- NJ: 22.5% by 2020
- PA: 18% by 2020
- DE: 25% by 2025
- DC: 20% by 2020
- MD: 20% by 2022
- VA: 15% by 2025; goal with production incentives
- NC: 12.5% by 2021 — IOUs
- 10% by 2018 — co-ops, munis
- TVA: 50% by 2020

Note: nature of RPS requirements, baselines, and qualifying resources differ substantially across states (e.g., some may include nuclear and clean coal or large hydro, others give preference to in-state or off-shore resources, etc.)

NERC-identified planned/proposed projects through 2018:

$50 billion ... estimated based on NERC circuit miles
(1/3 each for reliability, conventional generation, and renewables)

Of the $180 billion of individual projects identified earlier:

$30 billion ... in RTO-approved plans
$80 billion ... additionally proposed (non-overlapping)

Estimated US-wide incremental transmission needed to integrate renewables through 2025:

♦ To satisfy existing state-level RPS requirements
  $40-70 billion

♦ For higher of existing state and 20% federal RPS
  $80-130 billion
The benefits of regional transmission projects are:

| Broad in scope                                               | Renewables integration and environmental benefits |
|                                                            | Economic development from G&T investments          |
|                                                            | Increased reliability and operational flexibility   |
|                                                            | Reduced congestion, dispatch costs, and losses      |
|                                                            | Lower capacity needs and generation costs           |
|                                                            | Increased competition and market liquidity          |
|                                                            | Insurance and risk mitigation benefits              |
|                                                            | Fuel diversification and fuel market benefits       |
| Wide-spread geographically                                 | Multiple transmissions service areas                |
|                                                            | **Multiple states** or regions                       |
| Diverse in their effects on market participants             | **Customers, generators, transmission owners** in regulated and/or deregulated markets |
|                                                            | Individual market participants may capture one set of benefits but not others |
| Occur and change over long periods of time                  | Several decades                                     |
|                                                            | Changing with system conditions and future generation and transmission additions |
|                                                            | Individual market participants may capture different types of benefits at different times |
Additional Reading

“Comments of Johannes Pfeifenberger, Peter Fox-Penner and Delphine Hou,” in response to FERC’s Notice of Proposed Rulemaking on Transmission Planning and Cost Allocation (Docket RM10-23-000).


“Comments of Peter Fox-Penner, Johannes Pfeifenberger, and Delphine Hou,” in response to FERC’s Notice of Request for Comments on Transmission Planning and Cost Allocation (Docket AD09-8).


Pfeifenberger, Testimony on behalf of Southern California Edison Company re: economic impacts of the proposed Devers-Palo Verde No. 2 transmission line, before the Arizona Power Plant and Transmission Line Siting Committee, Docket No. L-00000A-06-0295-00130, Case No. 130, September and October, 2006.
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The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governmental agencies around the world.

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