THE ELECTRON SUPERHIGHWAY: NATIONAL POLICY AND PROSPECTS

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Overview

Nebraska is a resource- and ingenuity-rich state. Its current challenge is to monetize its advantage in wind power, biomass fuels and other energy assets. Like other states, it seeks reliable service and resource diversity for its domestic consumers as well as potential customers in other states and regions. Its public power credentials are all about the consumer. Unlike neighboring states, past reticence to enter the larger electricity market has allowed a first-mover advantage to migrate elsewhere. Nevertheless, recent developments suggest that Nebraska, acknowledging the growing economic and physical interdependence of Midwestern power markets, is preparing to seize upon new opportunities in those markets.

Nebraska's success will depend on the adequacy of energy delivery infrastructure in the state, in my view. To that extent, Nebraska's issues are the same issues facing the nation's electricity infrastructure generally, and the power markets that depend on it.

- What is the current need for, and obstacles to, electric transmission infrastructure investment in Nebraska and nationally? What are the benefits of a stronger grid?
- What role does the FERC seek to play in promoting transmission investment?
- What does the path forward look like?

The Grid Itself is Challenged to Keep Up

- Aging and deteriorating infrastructure
- More dispersed sources of generation, especially renewable energy
- Complex bulk power markets
- Wholesale competition among generators, and demand
- Arrival of the digital economy
- Electricity demand doubled between 1980 and 2007 – *and reliability problems kept pace*

Transmission challenges are part of a larger national infrastructure crisis, identified in 2009 by the American Society of Civil Engineers, involving roads, bridges, dams, levees, water supplies and other systems.

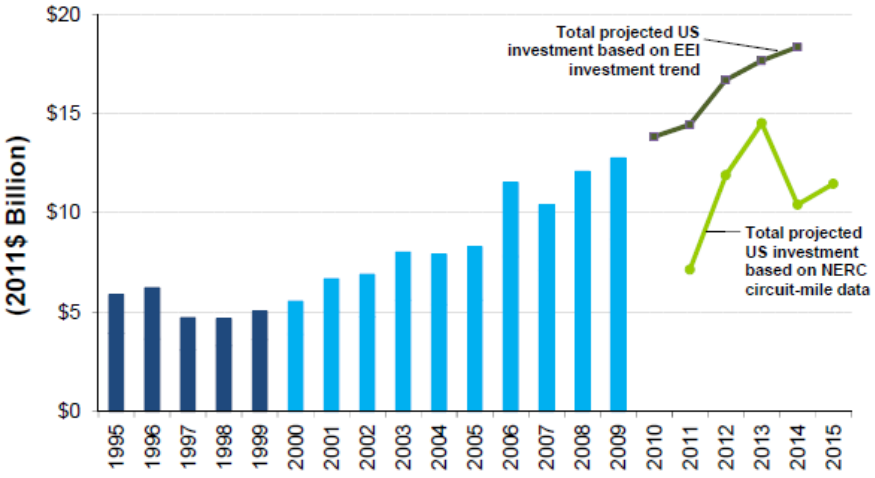
> *"The Nation's infrastructure crisis is no less serious for being silent. [Fixing it] will improve our quality of life, our standard of living and our competitiveness." (Warren Rudman and Felix Rohatyn, 2005)*

Barriers to Adequate Transmission Infrastructure Persist

- Lack of established regional and inter-regional transmission planning processes
- Unresolved cost allocation and recovery for multistate and inter-regional projects

- Largely uncoordinated and uncertain state-by-state permitting
- Uncoordinated state public policy requirement
- What is our national policy toward transmission infrastructure? We have yet to make some important deliberate choices:
    - Is transmission an enabler (e.g., of new resources and technologies) or a competitor and a threat to localized energy initiatives?
    - Do we want a grid that is strong and extensive like other networks (e.g., highways), or should it principally serve local needs?
    - Is the breadth of the grid and its capacity to balance multiple resources and loads an asset, or should we insulate load from grid-wide problems?
    - Is planning driven by generation investment, established business and regulatory assumptions, and public policy objectives like RPS, or the assumption that, if "we build it, they will come?"

Meeting the Challenge



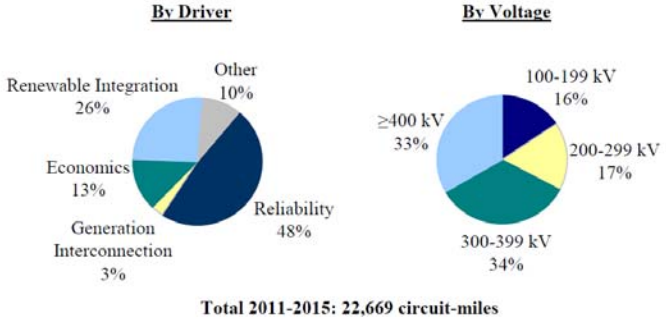
Source:
The Brattle Group, Employment and Economic Benefits of Transmission Infrastructure Investment in the U.S. and Canada, prepared by J. Pfeifenberger and D. Hou for WIRES, May 2010.

- Projected transmission investment – $300+ billion by 2030
- Transmission expenditures have ramped up from $5 billion/year (1999). Up to $12 billion-$16 billion/year is expected 2011-2030 to address lingering problems and reach new resources.

Principal Drivers of Transmission Development

Of the 39,000 circuit miles of transmission needed near-term, about one-third is needed to connect renewables. The majority of facilities are reliability-driven.

Figure 3
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)



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).

Benefits of More Transmission Investment

- NREL: 20% wind by 2030 or roughly 300 GW – 2/3 of which require new transmission; reduced integration costs from larger balancing areas
- Implementation of 30+ state renewable portfolio standards
- Reduced transmission congestion and generation costs
- Increased system reliability; operational benefits; "insurance" benefits
- Reduced systemwide 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:
    - 150,000-200,000 full-time jobs each year as construction proceeds
    - $30 billion-$40 billion in annual economic activity (direct, indirect and induced impacts of manufacturing and construction)
    - Transmission-enabled wind would produce another 250,000+ jobs annually (WIRES/Brattle Group study at www.wiresgroup.com)
    - 20% wind would support 500,000 jobs annually (NREL)

The Role of FERC in Advancing Transmission Investment

Under the Federal Power Act, the agency has historically ensured just and reasonable rates and non-discrimination in wholesale power markets. The "new" FERC of the past 20 years is focused on the operation of competitive markets and enforcement of market rules. It has broad regulatory power over rates for, access to, and operation of transmission and the

wholesale power transactions the grid supports. BUT it cannot authorize or site actual transmission facilities that form the basis for interstate commerce in electricity – that is the job of a changing collection of state and federal agencies and local boards and cooperative members.

Order No. 1000

This Order could have been written for Nebraska. It is open-ended, flexible and deferential to regional stakeholders. While I would have preferred more guidance from FERC, the framework it establishes for planning and paying for new transmission permits distinctive regional outcomes to be crafted to suit the institutional and market realities around the country.

However, FERC can be expected to reject proposals that do not promote efficient and non-discriminatory market outcomes.

- Planning – What lines do we need?
    - "Who decides" is totally unclear in today's environment
    - Requires regional planning processes
    - Requires regions to coordinate on mutual solutions
- Cost allocation – Who pays for new lines or upgrades?
    - To be decided within the planning process
    - Regional and inter-regional methodologies
    - “Beneficiaries pay” commensurate with benefits received
- Utility rights of first refusal to build transmission (ROFR)
    - Eliminated as anti-competitive
    - Incumbents still responsible for reliability
    - Does not affect local or state laws
- Incentives (under EPAct 2005) – a source of controversy
- Reliability standard enforcement – a source of controversy
- Backstop siting (FPA sec. 216) – a source of a lot of controversy. While states will retain primary (practically speaking, exclusive) jurisdiction over siting, it remains a challenge to site facilities on private, state or federal lands. There is no electric transmission counterpart to federal oversight of natural gas pipeline certification and siting, and Congress’ effort to encourage better state siting is based on the implausible assumption that some parts of the grid (“national interest corridors”) are more vital for interstate commerce than others and therefore justify potential federal intervention.

Other Factors Affecting Electronic Transmission Policy

Misaligned Regional Goals: The More Things Change ….

- California’s governor warns that the state’s RPS can be met with only instate resources and the state cannot be relied on as a market for other Western renewable resources.
- Northeastern governors have rejected large-scale imports of Midwestern renewable resources in favor of local job-producing offshore development and foreign imports, without evidence of potential ratepayer costs and benefits.

- State regulators, traditionally protective of their jurisdictions and focused on keeping rates for consumers low, create uncertainty about the direction of national policy.

Federal Administration Actions: Better Than Nothing

- President Obama's "Rapid Response Team" focused on reforming siting on federal lands.
- EPA's new Clean Air Act regulations (e.g., Cross-State Air Pollution Rule) will lead to retirement of coal-based generation and billions of dollars in retrofits, complicating transmission planning and creating reliability concerns but accelerating the need for renewables integration.
- Eastern Interconnection Planning Collaborative – interconnection-wide scenario planning funded by the stimulus legislation. In the absence of clear national policy goals, it remains difficult to know what to plan for.

Legislation in the 112th: Good, and Not So Good, but Not Much

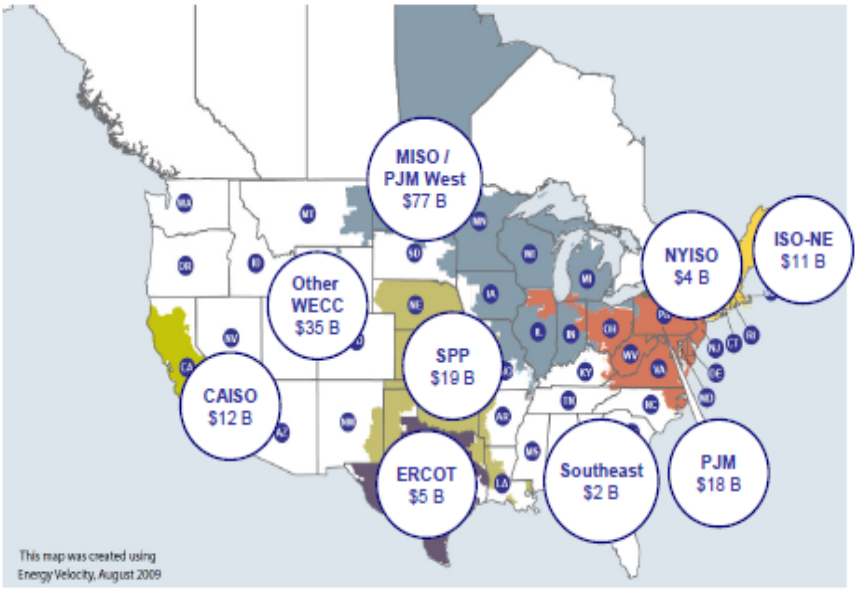
- HR 3280 would give FERC authority to make determinations that transmission projects are "needed" based on regional plans.
- S. 400 (Sens. Corker & Wyden) would restrict FERC's authority to spread costs regionally to all beneficiaries, with probable impacts on transmission for renewables; would reverse the cost allocations adopted by SPP and MISO using broad stakeholder processes.
- Proposals for an Infrastructure Bank - public/private institutional partnership to attract infrastructure investors.

Electricity Policy Formulation is Not for Sissies; The Politics of Infrastructure Remain Tough

(Source: NREL)

Although there are plenty of proposed transmission lines being drawn on the map in recognition of a variety needs, the question remains ….

Figure 4
$180 Billion of Planned and Conceptual U.S. Transmission Projects



Source: Map from FERC. Project data collected by *The Brattle Group* from multiple sources and aggregated to the regional level. Updated as of April 17, 2011.

	$ Billion	*Share of Total*
[1] **Total Projects Shown**	**$182**	*100%*
[2] *Projects Approved in RTO Plans*	*$26*	*14%*
[3] *Projects Not Yet Approved by RTOs*	*$156*	*86%*
[4] **Adjustment for Overlapping Projects Not Yet Approved by RTOs**	**($73)**	
[5] **Total Net of Overlapping Projects**	**$109**	*60%*

Sources and Notes:

[1]: Project data collected by *The Brattle Group* from multiple public sources and aggregated to the regional level.

[2]: Projects approved in RTO plans are a subset of [1]. Percentage is of total in [1].

[3]: Projects not yet approved in RTO plans are a subset of [1]. Percentage is of total in [1].

[4]: Based on analysis by *The Brattle Group*, the total costs of overlapping projects not yet approved by RTOs was divided by the number of such projects. No analysis was performed on the likelihood of succes for each project.

[5]: [1] + [4]

Will Actual Investment Dollars Show Up, and Will These Proposed Projects Be Built?

If we continue to lack an energy delivery policy that favors a national market for power in which all resources can compete, the outlook is clouded. An interstate highway for electrons requires interstate – at least regional – solutions. Unless Nebraska's resources can reach load for the benefit of consumers (and the environment), they will be trapped.
We now have the ingredients for potential solutions:

- A focus on the nation’s infrastructure, energy independence and job creation;
- Technologies that are bringing the cost of all forms of energy down, including natural gas that can help integrate variable renewable resources;
- Federal and (somewhat hesitant) state agencies that are forcing development of regional and inter-regional planning solutions;
- Capital markets that are prepared to participate if regulatory certainty is ensured;
- Grid entrepreneurs who take development risks with no guaranteed return; and
- State governors and other policymakers who are actively engaged in the issue of energy.

A Few Final Observations

1. Don't wait for Washington. Comprehensive energy policy is all but off the table for the next 18-24 months. You have to work with national leaders and issues, but you don't need to be driven by them. Regional solutions are a great start and SPP is an important forum within which to push for better markets for renewable energy. Order No. 1000 sets forth critical procedural goals, but in many ways it is a blank slate. Use it to begin to write the state's clean energy destiny.
2. Despite this period of recession and retrenchment, marshalling capital - both financial and political - in support of the grid is an investment in America's future.
3. Wind resources are some of Nebraska' greatest patrimony. Developing them requires practical and intelligent planning and advocacy. That does not mean waiting for other states to take the lead, however, for this is truly a competition in the race for new markets and more coherent policies.