Expanding Transmission Capacity: Options and Implications

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Policy Matters

• The level of uncertainty that exists around future policy decisions creates difficulty for those involved in the planning function and causes hesitancy for those with the resources to undertake transmission expansion projects.

• To minimize the risk involved with planning a system under such conditions, the process must consider projects in the context of all potential outcomes.

• Identifying transmission plans that result in the least regrets regardless of policy decisions will help to alleviate the impacts of those future outcomes.
Transmission Design Challenge

• General Problem Statement for Transmission Study
  – Minimize transmission capital costs, generation capital costs and system energy costs while maintaining system reliability

• Problem solution subject to sometimes competing constraints or goals:
  – Minimize investment risk (seek shorter payback horizon)
  – Maximize carbon reduction (replace coal production)
  – Maximize local economic development (install wind directly within RPS State)
  – Maximize economic value (seek lowest cost to customer)
Transmission Planning Approach is Evolving

In order to achieve its planning objectives, the Midwest ISO has transformed its transmission expansion planning model; this process will continue to mature as experience is gained.

**Reliability-Based Model**
- Focused primarily on grid reliability
- Typically considers a short time horizon
- Seeks to minimize transmission build

**Value-Based Model**
- Focused on value while maintaining reliability
- Reflects appropriate project time scales
- Seeks to identify transmission infrastructure that maximizes value
- Identification of the comprehensive value of projects
MISO Renewable Planning Efforts

**RGOS Phase I**
- **Scope:** Develop transmission for mandates in IA, IL, MN, WI; 11-13 GW, completion 3rd Q 09
- **Participants:** MISO, States, Regulators, Governors, PJM
- **Lead:** MISO for MTEP, UMTD, MGA
- **Who's Watching:** State Regulators, Governors Offices (UMTD, MGA), FERC, State Transmission Authorities

**RGOS Phase II**
- **Scope:** Develop transmission for mandates in IL, IN, MI, MO, OH; ~23 GW, completion 4th Q 09
- **Participants:** MISO, Stakeholders, Regulators, Governors, PJM
- **Lead:** MISO and MGA
- **Who's Watching:** State Regulators, Governors Offices (UMTD, MGA), FERC, State Transmission Authorities

**MTEP Renewable Scenario**
- **Scope:** Develop MISO transmission; 15-50 GW (20% scenario); on-going
- **Participants:** MISO, Stakeholders
- **Lead:** MISO
- **Who's Watching:** MISO Stakeholders

**JCSP**
- **Scope:** Develop East Int transmission; 50-91 GW (20% scenario)
- **Participants:** MISO, PJM, SPP, TVA, MAPP, Utilities
- **Lead:** MISO for Dept of Energy
- **Who's Watching:** Utilities, ISO's/RTO's

**EWITS Integration Study**
- **Scope:** Operating impacts of JCSP; End of Aug 2009; 50-91 GW (20% scenario)
- **Participants:** MISO, PJM, SPP, TVA, MAPP, Utilities, EnerNex, Ventyx
- **Lead:** EnerNex for Dept of Energy
- **Who's Watching:** Utilities, ISO's/RTO's
Renewable Portfolio Standard Impacts on Generation Requirements

- Renewable case reflects 20% Midwest ISO Renewable Portfolio Standard (RPS)
- 20% national RPS would result in increased levels of wind generation in Midwest ISO to meet Eastern Interconnect Goals

* Reference case reflects RPS as of October 2007 for the Midwest ISO footprint; current RPS is 22,000 MW
** Requests under evaluation in queue as of March 11, 2009; wind includes 165 MW of other renewables
Different policy assumptions result in very different siting outcomes with different transmission system requirements.
Existing Generation Also Impacts the Outcome

Data Source: 2007 – EIA-860 – Annual Electric Generator Report
The transmission overlay for the Reference Case (Status Quo) establishes the need for some backbone development...
…While the 20% Wind Energy Case highlights the need for substantial transmission backbone development.
Conceptual Progression of Plans
Planning Horizons

1 year
Queue
RGOS
JCSP
20 year
Interregional plan provides a longer term view...

Planning Horizons

1 year

20 year

JCSP
... which supports RGOS Aggregate Plans that better inform ...

Planning Horizons

RGOS
Queue Development of near term upgrades

Planning Horizons

1 year

Queue

20 year
State Regulatory Initiatives

- State regulators are increasingly working on a regional or subregional basis to address cost allocation questions within the context of regional plans
- UMTDI:
  - Upper Midwest Transmission Development Initiative
  - 5 State initiative (ND, SD, IA, MN, WI)
  - 2 goals by year end 2009
    - Regional Generation Outlet Plans to meet RPS'
    - Cost Allocation for those plans
- CARP:
  - MISO-wide state initiative to review Cost Allocation and Regional Planning principles
  - Eye towards impact of existing and possible state and federal renewable standards, and carbon reduction legislation
Conditions Precedent to Increased Transmission Build

• A robust business case for the plan
• Increased consensus around regional energy policy
• A regional tariff that matches who benefits with who pays over time
• Cost recovery mechanisms that reduce financial risk