CapX 2020 Transmission Projects & Planning

Ensuring Reliability

U of MN Renewable Energy Workshop
October 12, 2006
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Today’s topics

- Background & the Initial Projects
- Implementing the Projects
- Planning for Future
CapX 2020: Capacity Expansion Needed by 2020

- Formed Spring 2004
- An alliance of 11 electric cooperatives & municipal and investor-owned utilities

Participating utilities
- Dairyland Power Cooperative
- Great River Energy
- Midwest Municipal Transmission Group
- Minnesota Power
- Minnkota Power Cooperative
- Missouri River Energy Services
- Otter Tail Power Company
- Rochester Public Utilities
- Southern Minnesota Municipal Power Agency
- Wisconsin Public Power Incorporated
- Xcel Energy
Customer Use Is Growing

- Historical growth from 2000-2004: 2.64%
- CapX growth 2009-2020: 2.49%

![Graph showing MW demand trends from 1980 to 2000](image-url)
6300 megawatts of load growth in the region through 2020 will require 8000 megawatts of additional generation.
Process

- Modeled three scenarios of where generation facilities might be developed
- Assessed transmission required under each scenario
- Many facilities were common to all three scenarios
- Established best sequence for project groups
- Total capital cost for transmission estimated - ~ $3 billion
Initial Vision Study - Need for 345-kV Backbone System by 2020
<table>
<thead>
<tr>
<th>Project Group</th>
<th>Desired In-Service</th>
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<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td></td>
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<tr>
<td>SE Twin Cities-Rochester-LaCrosse / 345kV</td>
<td>2011</td>
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<tr>
<td>Bemidji-Grand Rapids/ 230 kV</td>
<td>2011</td>
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<tr>
<td>Fargo-St. Cloud/Monticello area / 345kV</td>
<td>2012</td>
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<tr>
<td>Brookings, SD-SE Twin Cities / 345 kV</td>
<td>2012</td>
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<td><strong>Group 2 – Around the Twin Cities</strong></td>
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<td>New 345 KV transmission loop around the Twin Cities</td>
<td>2014 to 2020</td>
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<td><strong>Group 3 – Remote Generation Outlet</strong></td>
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<td>As needed and generation projects developed</td>
<td>2014 to 2020</td>
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Group 1 Projects

- Four lines work together to ensure reliability for the region
- Lines meet most urgent need
- Lines will serve as outlet for whatever generation resources are built

(These corridors are preliminary)
Improves reliability for south metro Twin Cities, Rochester and LaCrosse areas; improves access to generation in south and east

Scope: approx. 110 miles, 345 kilovolt

Desired in-service: 2011
Group 1 Project

CapX Bemidji – Grand Rapids

- Improves reliability for Red River Valley, Bemidji and North Central Minnesota
- Scope: approx. 70 miles, 230 kilovolt
- Desired in-service: 2011
CapX Fargo – St. Cloud/Monticello Area

- Improves reliability in Red River Valley, North Central Minnesota and St. Cloud area, provides some access to new generation
- Scope: approx. 210 miles, 345 kilovolt
- Desired in-service: 2012
Group 1 Project

CapX Brookings, SD – SE Twin Cities

- Improves reliability in West Central Minnesota and Twin Cities; access to new generation, including wind
- Scope: approx. 250 miles, 345 kilovolt
- Desired in-service: 2012
Moving Into Implementation – Group 1 Permitting

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<tbody>
<tr>
<td>File MN CON</td>
<td>Review &amp; Hearing</td>
<td>CON Issued</td>
<td>Preliminary routing</td>
<td>Routing Analysis</td>
<td>Final Routes</td>
<td>Public Meetings</td>
<td>River Crossing Assessment</td>
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<td>Agency/Municipality Meetings</td>
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<td>Wisconsin CPCN/DNR Permits Process</td>
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<td>Minnesota Route Permit Process</td>
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<td>Federal Review (RUS, USFWS, Corps) Process</td>
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Moving Into Implementation – Certificate of Need

Brookings, SD – SE Twin Cities project – proposed notice area
Define best practices and consistently follow them

- Permitting Activities
- Public Affairs Plan
- General Communications
- Contractual Agreements
- Design & Construction
- Procurement
Implementation – Integrating Multiple Projects

For a long, complex, multi-party effort, clearly defining accountability & authority is important

Project Team Leadership While Acquiring Need Permits

Project Team Leadership After Acquiring Need Permits
Implementation – Issues for the “Build” Phase

- Beginning investigation of an optimal model for detailed engineering, procurement, construction management
- Need to analyze availability of skilled trades labor
- Develop plan for sequencing construction of individual facilities
## Planning for the Future

### Planning Tasks

<table>
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<tr>
<th>August</th>
<th>September</th>
<th>October</th>
<th>November</th>
<th>December</th>
<th>Q1 2007</th>
<th>Q2 2007</th>
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<td>Joint Group I Study</td>
<td>Group II Study</td>
<td>CBED Study</td>
<td>MISO Cost Allocation (RECB) Analysis</td>
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- **Joint Group I Study**
- **Group II Study**
- **CBED Study**
- **MISO Cost Allocation (RECB) Analysis**
- **SPG/MISO/Non-MISO TP Study Coordination**
- **Group I CON Support**
- **MN Biennial Plan Coordination**
- **Vision Study II**

*CapX 2020 2006*
Ensuring Electric Reliability in Minnesota and the Surrounding Region

CapX 2020 represents an innovative joint initiative to ensure long term electric reliability for Minnesota and the surrounding region in the future. It began as a collaborative planning effort by the state's largest transmission owners (including cooperatives, municipals and investor-owned utilities) to assess the current system and project the growth in customer demand for electricity through 2020.

Studies show that customer demand for electricity will grow by 5,200 megawatts by 2020, resulting in the need to build 3,000 megawatts of new generation to account for required reserves and energy lost during transmission. To accommodate this growth in customer demand for new power, the transmission backbone will require major upgrades and expansion to ensure reliability.

An expanded CapX 2020 group has now entered the project phase to meet this demand. In 2006, the CapX utilities will begin seeking regulatory approval for approximately 600 miles of 345 kilovolt lines in Minnesota with short segments in North Dakota, South Dakota and Wisconsin. Regulatory filings for a smaller, 230 kilovolt line in north-central Minnesota also are planned.

CapX 2020, which originally stood for "Capital Expenditures by the Year 2020" -- to make sure the capital would be available to meet the need -- has now become "Capacity Expansion by the Year 2020" -- as the group moves
Thank you!

Questions, comments, suggestions