Transmission Planning Necessary But Not Sufficient

- Need to integrate:
  - Reliability and generation planning with transmission planning
  - DSM and DG with generation and transmission planning
  - Environmental concerns and exclusions
  - Siting, routing, and local land use concerns and interests
  - Political and policy leadership
  - Public, private and non-profit interests

Not fair to load all this on transmission planners.

Fortunately, there is a model from which we can learn...

CAPX 2020

- Minnesota Xcel Energy has led comprehensive, long-term, state-wide transmission planning
- Minnesota Xcel's CAPX 2020 plan includes attention to imports and exports
- Minnesota Xcel's CAPX 2020 plan involves significant outreach to affected local interests and areas

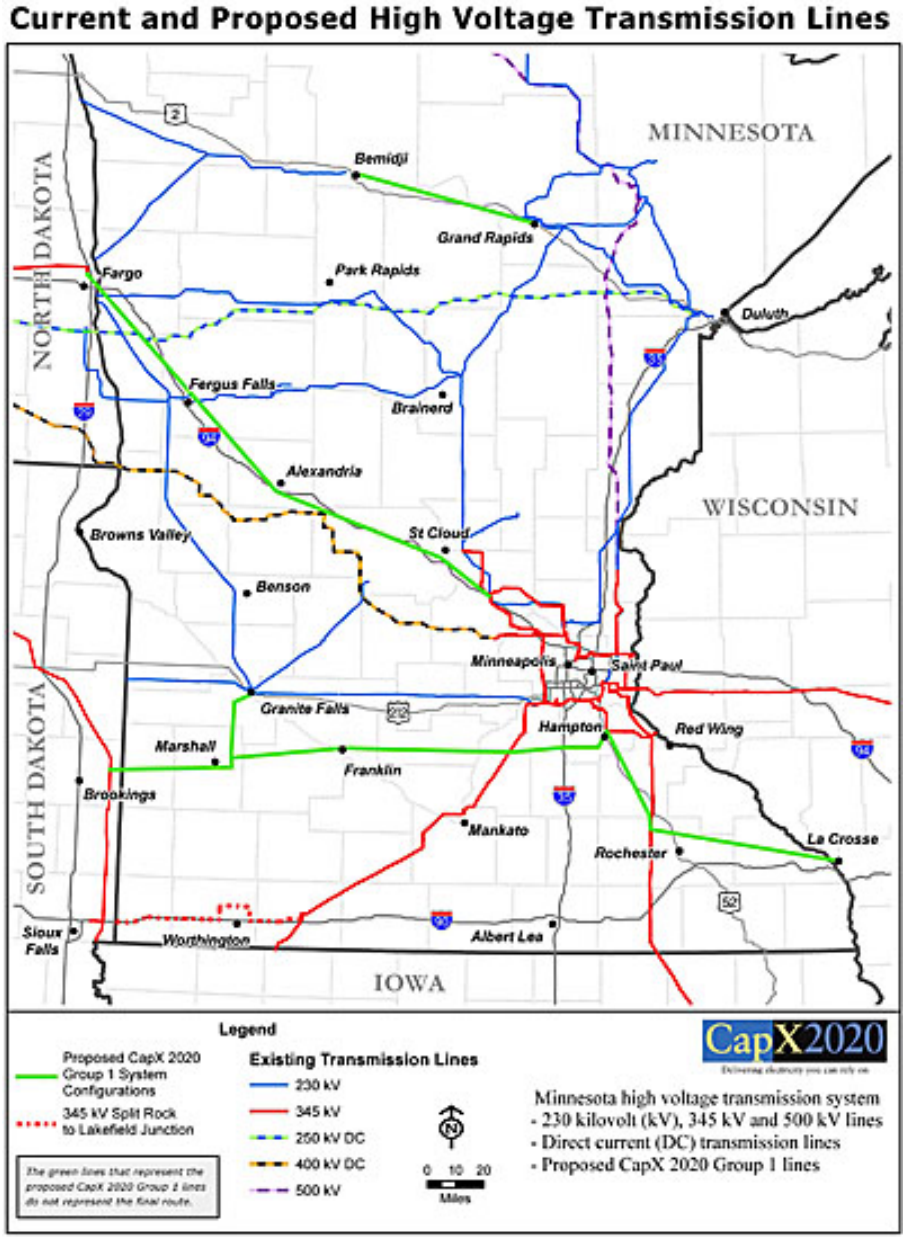
CAPX 2020 web site

- http://www.capx2020.com/index.html
  - "Ensuring Reliability In Minnesota and the Surrounding Region"
  - Reliability Needs Areas
  - Proposed Route Maps
  - Public Interactions
  - High Voltage Transmission and Wind Photos

CAPX Reliability Areas

CapX 2020 Proposed 345 kV Transmission Line Projects
Electric Reliability Benefit Areas

CAPX 2020


Current and Proposed High Voltage Transmission Lines
MINNESOTA
NORTH DAKOTA
SOUTH DAKOTA
WISCONSIN
IOWA
Bemidji
Grand Rapids
Fargo
Park Rapids
Duluth
Fergus Falls
Brainerd
Alexandria
Browns Valley
St Cloud
Benson
Minneapolis
Saint Paul
Granite Falls
Hampton
Red Wing
Marshall
Franklin
Brookings
Mankato
La Crosse
Rochester
Sioux Falls
Worthington
Albert Lea
Legend
Proposed CapX 2020 Group 1 System Configurations
345 kV Split Rock to Lakefield Junction
The green lines that represent the proposed CapX 2020 Group 1 lines do not represent the final route.
Existing Transmission Lines
230 kV
345 kV
250 kV DC
400 kV DC
500 kV
0 10 20
Miles
CapX2020
Minnesota high voltage transmission system
- 230 kilovolt (kV), 345 kV and 500 kV lines
- Direct current (DC) transmission lines
- Proposed CapX 2020 Group 1 lines

CAPX2020 Regulatory Filings

- “The role of the Minnesota Public Utilities Commission” explained on the website
- Minnesota regulatory filings
- Minnesota regulatory process fact sheet explains process for high voltage transmission lines.
- Applications for Certificate of Need:
  - three CapX2020 345-kV projects filed with the Minnesota Public Utilities Commission August 16, 2007
  - A 230-kV transmission line and associated system connections from Bemidji to Grand Rapids was filed with the Minnesota Public Utilities Commission on March 17, 2008.

CAPX 2020 “Learn More”

Fact sheets (PDF format)

- Minnesota regulatory process for high voltage transmission lines
- North Dakota regulatory process for high voltage transmission lines
- South Dakota regulatory process for high voltage transmission lines
- Wisconsin regulatory process for high voltage transmission lines
- CapX2020 proposed transmission line projects
- Electric and magnetic fields (EMF): the basics
- CapX2020 utilities: A commitment to conservation
- Birds and power lines
- Need for reliable electricity rises with demands
- CapX2020 proposed transmission line infrastructure
- Upper Midwest high voltage transmission projects 1967-2007
- Understanding easements and rights-of-way
- Transmission planning through construction: A decade-long process
- Bemidji-Grand Rapids project
- SE Twin Cities-Rochester-La Crosse project update
- Brookings County-Hampton project
- CapX2020 routing process: Brookings County-Hampton project
- Fargo-St. Cloud-Monticello project

CAPX2020 “Learn More”

- **Glossary**
- **FAQs**
  - Frequently asked questions about CapX2020, improved infrastructure benefits, transmission options, safety, property easements and public participation
- **Dependable electricity**
- **Newsletters**

CAPX 2020 Calendar

- Public Meetings
- Public Comment Periods
- Public Hearings
- Open Houses

CAPX 2020 Lessons for Colorado

- The Colorado Commission and stakeholders should compare the Xcel SB07-100 Report with what is in either Minnesota regulatory filings or in the public outreach materials
- A long-range system plan to address reliability should be an important priority
- Where the system plan for reliable long term service can also serve new generation areas, it should do it
- Where additional investment is needed beyond the system plan, then different approaches may be needed
- Xcel led progress in Minnesota
- Xcel should lead progress in Colorado

Scenario Planning

- Peter Schwartz, planner for Shell
  - Chart current trends
  - Anticipate disruptive changes
  - Get a story line ready
- Global Business Networks
  - AWEA 1994 scenarios for Electric Industry

Contribution to Colorado's transmission planning: set up expectations for "off ramps" from current trends

We should get a story together for when conditions change

“Ecoquake”

- Worsening ecological events
- Climate erratic
- Wind patterns change
- Ocean current shifts
- Major policy support for eco-tech
- Carbon tax
- Long term orientation
- Green accounting FASB changes
- IRP
- Tax incentives
- Renewables favored, financing and siting easy
- Economy mixed, restructuring challenging

“Technostrike”

- Micro gen
- Tech surprises: cold fusion, packaged fuel cells
- Distributed utility, customer service approach
- Gas grid, storage on site
- EMF concerns, dismantle existing grid
- Push for high efficiency (1/48 of current national resource use)
- Houses, autos, appliances are smart
- Local storage (flywheel, etc.)
- Hydrogen in the mix

[ADD: Branson Prize Winner?]

“Market Machismo”

- Price dominates
- Gas plentiful, cheap
- CCGTs
- Short term orientation
- Decarbonizing effect
- Chronic environmental conditions
- Utility industry restructuring
- Customer options, pro choice
- Strong international economy
- Avian avoidance innovations

“Frozen in the Headlights”

- Utilities stagnate, restructuring stalls
- Erratic politics
- Incoherent policies
- Chronic, not critical environmental problems
- Economy weak, fluctuating
- Wall Street warns against investments
- Delay-- strategy of the day
- Plant extensions, some new gas generation
- RTGs under discussion
- NIMBY worse
- No technology breakthroughs
- No long term commitments