



CapX 2020

*A Vision for Transmission
Infrastructure Investments for
Minnesota*

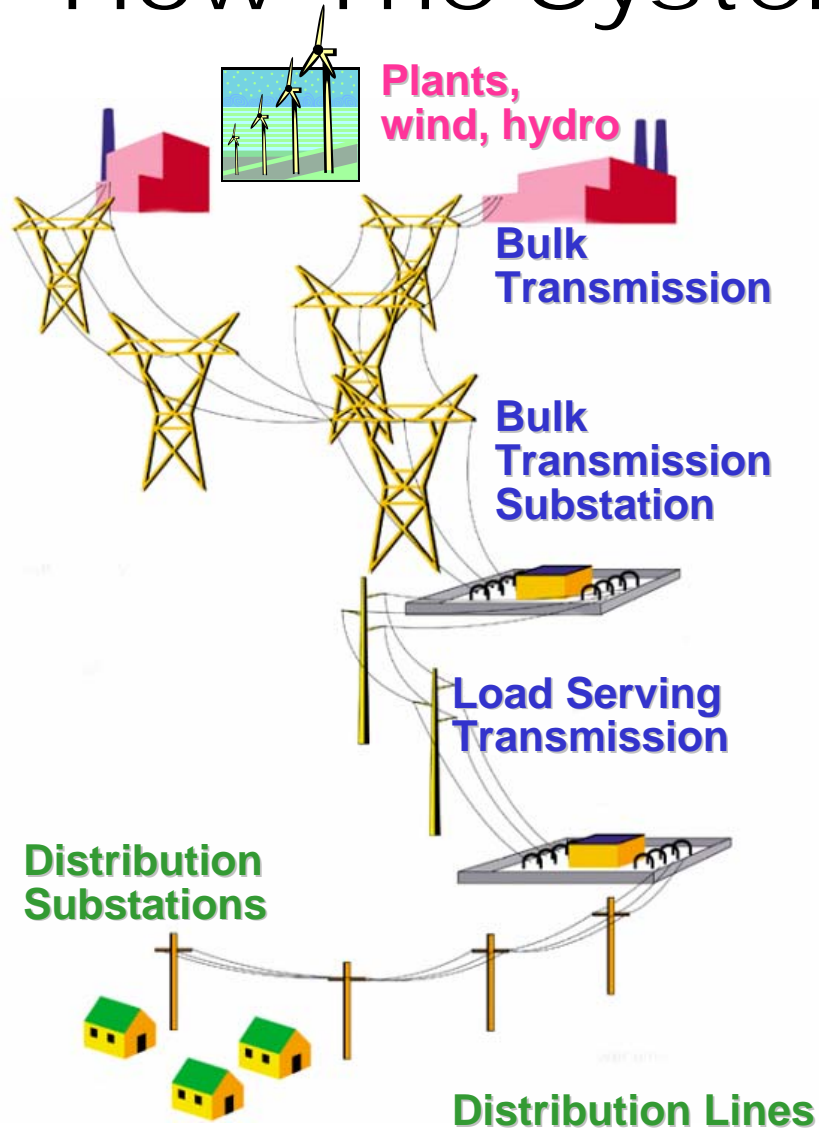


What Is CapX 2020

CapX 2020 is a joint effort by Minnesota transmission utilities to look at future transmission needs in a global, coordinated way



How The System Works



Power is generated or purchased

Bulk transmission (>115kv) moves the power to transmission substations

These substations drop the voltage down

Load serving transmission (<115kv) moves the power to the distribution substation

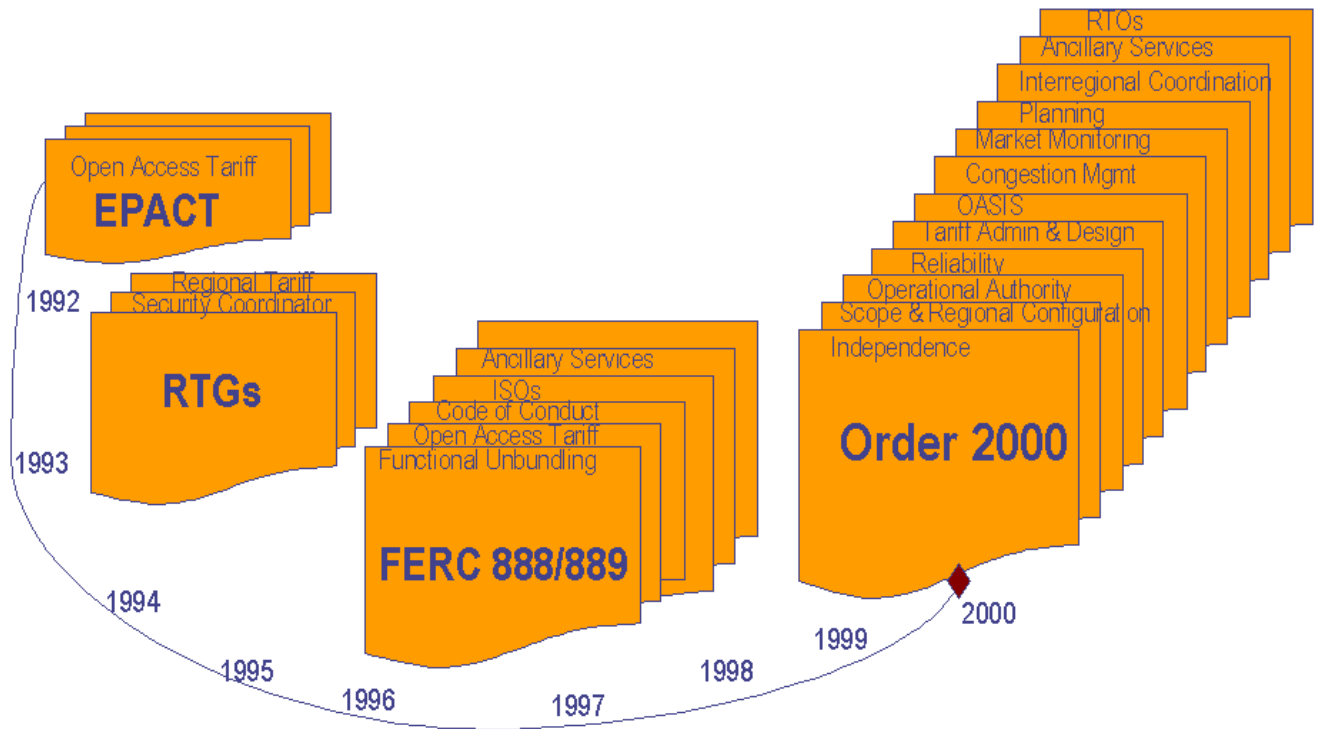
Distribution substations drop the voltage down

Distribution lines move the power to business, industrial and residential customers



Open Access Transmission

FERC regulates access to the transmission grid





The World Has Changed

Before Open Access (60s, 70s)	After Open Access (Now)
Each utility was more of an island: Utilities owned and controlled transmission, primarily for themselves	Competitive wholesale markets with transmission as the vehicle
Utilities conducted integrated planning for generation and transmission – no separation issues	Utility transmission planners must plan for all generation projects in a non-discriminatory manner – limits on integrated planning
Coordination was through MAPP for some functions	MAPP is replaced by MISO and MRO

MISO and Open Access

■ Functions

- Grid access
- Congestion management
- Reliability
- Planning
- Market





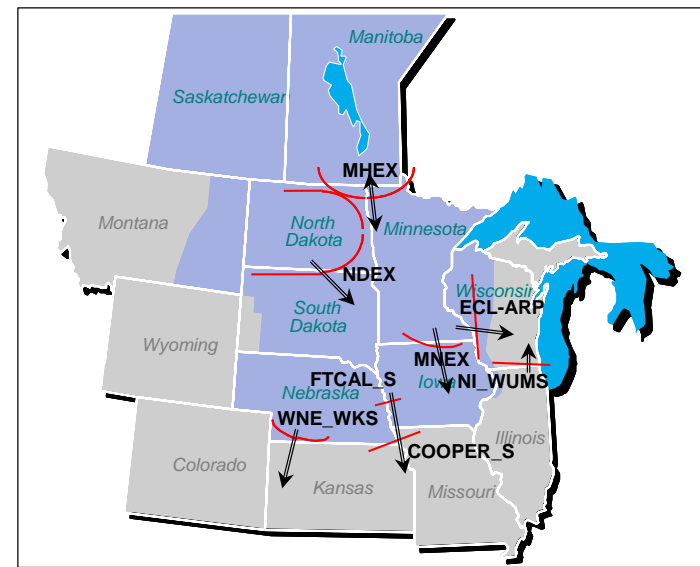
Transmission Congestion

Months	1998	2002
Jan-Mar	30	205
Apr-Jun	95	365
Jul-Sep	125	605
Oct-Dec	35	345

Source: ICF Consulting –
data from April 2003 report

Transmission reliability curtailments (Midwest Market)

Source: FERC presentation at
Midwest Energy Infrastructure
Conference, November 2002

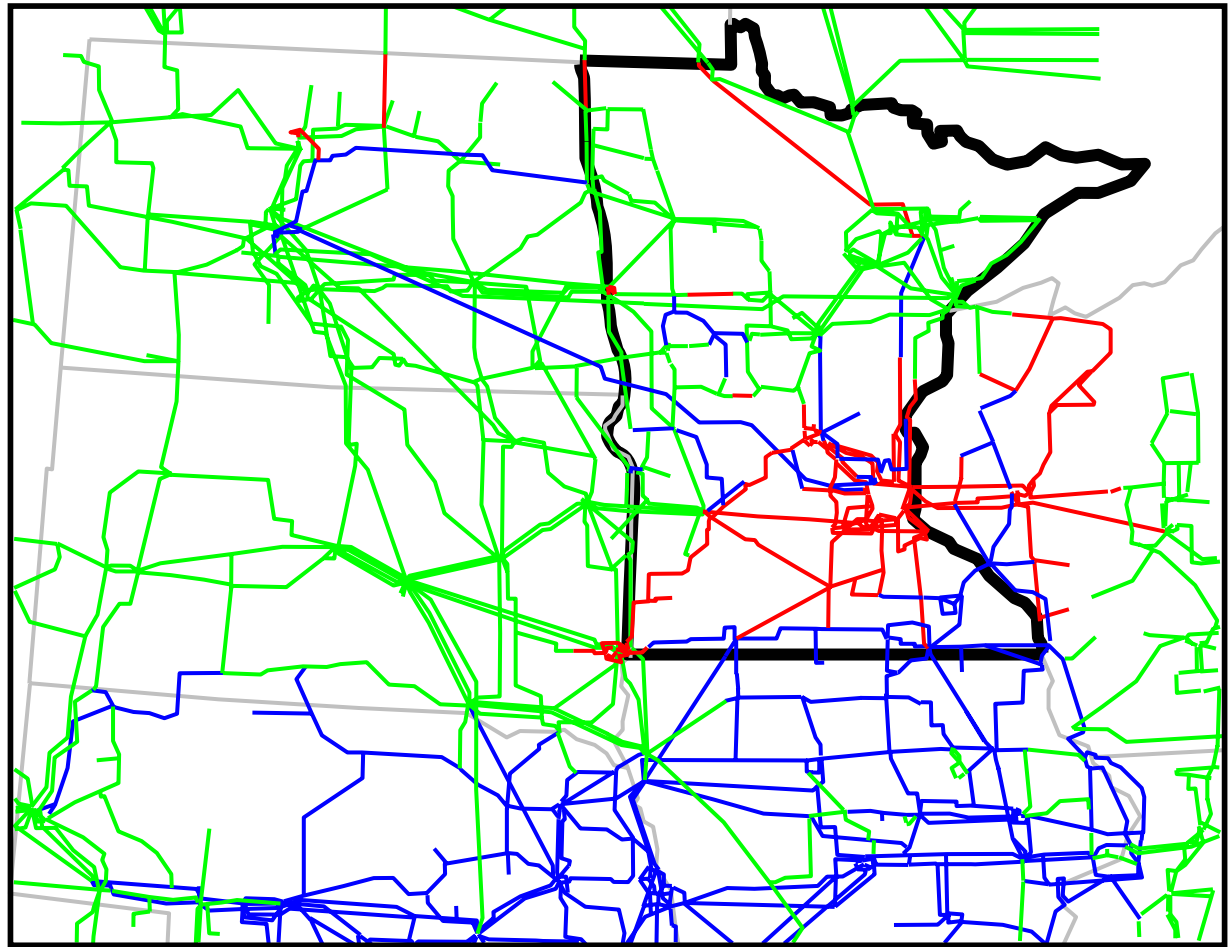




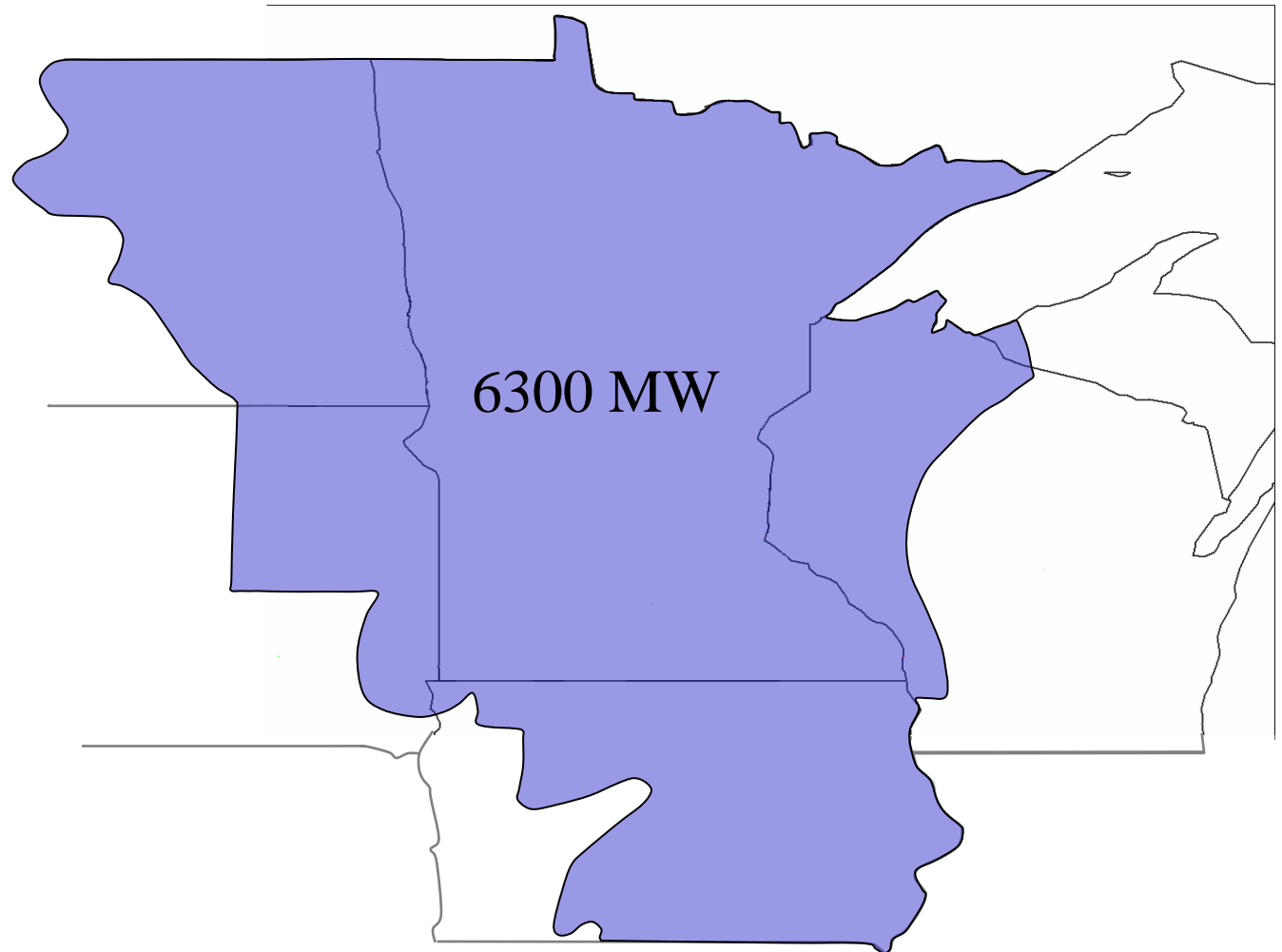
Why We Came Together

- To facilitate expansion of the transmission grid
 - To relieve congestion
 - To provide market access
 - To maintain reliability into the future
- What is at stake
 - Reliable power
 - Access to renewable energy
 - Low-cost energy and economic vitality in the state
- To request policy changes to help make this happen

Our Interconnectedness



Study Load Area





Load Zones

Control Area	2009 Load Level (MW)	Yearly growth rate (%)	Calculated 2020 Load Level (MW)
Alliant Energy (W)	3265.3	1.60	3888.2
Xcel Energy (N)	9632.6	2.68	12885.1
MN Power	1507.3	1.70	1814.4
SMMPA/RPU	330.0	2.70	442.4
Great River Energy	2833.5	3.05	3894.0
Otter Tail Power	1677.2	2.70	2248.3
Dairyland Power Coop	954.7	2.60	1266.2
Total	20,200.6	Ave.=2.49	26487.8



What We Are Finding

Scenario	System Intact Overloads	Prior Outage Overloads	Voltage Violations
North/ West	42	142	45
MN	42	187	14
East	42	197	33

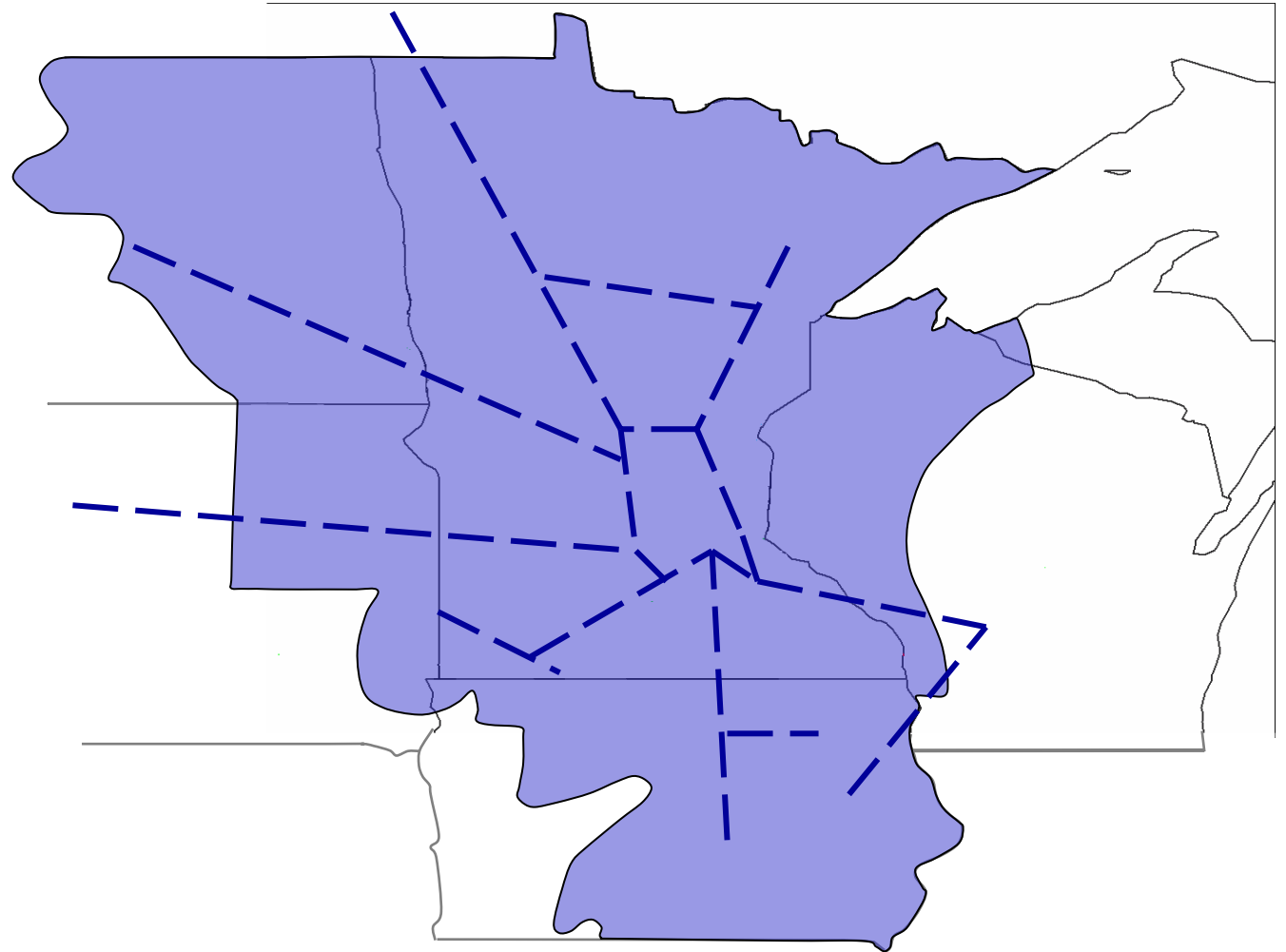


What We Were Able To Do

- Established a vision of transmission expansion needed over the next 15 years to serve the projected 4,500 to 6,300 MWs of increased customer demand
- Identified, through detailed studies, reliability issues
- Assessed and identified impediments to building needed infrastructure in a timely manner
- Informed and educated decision makers and stakeholders on the above
- NOW, we are able to gear up for a major grid expansion



Conceptual Transmission





What Minnesota Needed

- Timely, efficient and certain cost-recovery mechanism
 - Utilities cannot finance large capital expenses between rate cases
 - Utilities need to recover costs, CWIP and a higher ROE
 - PUC had the authority, but legislation made this clear
- Improved Certificate of Need criteria
 - Old standard was generation to load
 - Now, regional needs and reliability are equally important
- Focused siting and routing procedures
 - Process was bifurcated
 - Current process lead to delays, confusion and wasted time



At Stake: Reliability

- Our current transmission system is strong but reaching its limit, and it's at its limit more frequently as time goes on
- As the demand for electricity increases and the projected generation is built— including significant amounts of wind power — the robustness of the grid will deteriorate



At Stake: Renewables

- Renewable Energy Objective: 2400 MW of renewable generation
- No such thing as “green” transmission: Transmission is resource “neutral”



At Stake: Access

- Access to low-cost power serving future energy needs of the consumers of Minnesota
- Translates into the economic vitality of the state



Our Conclusions

- We needed to expand the grid to meet growing customer demand
- Future reliability, renewable energy and access to low-cost power were all at stake
- We had time to do this right – if we started now
- The world has changed and we need to change with it to address this critical need
- Legislation in 2005 allowed all this to become a reality