

High-Voltage Transmission in Kansas

Alan Myers/Michael White

ITC Great Plains

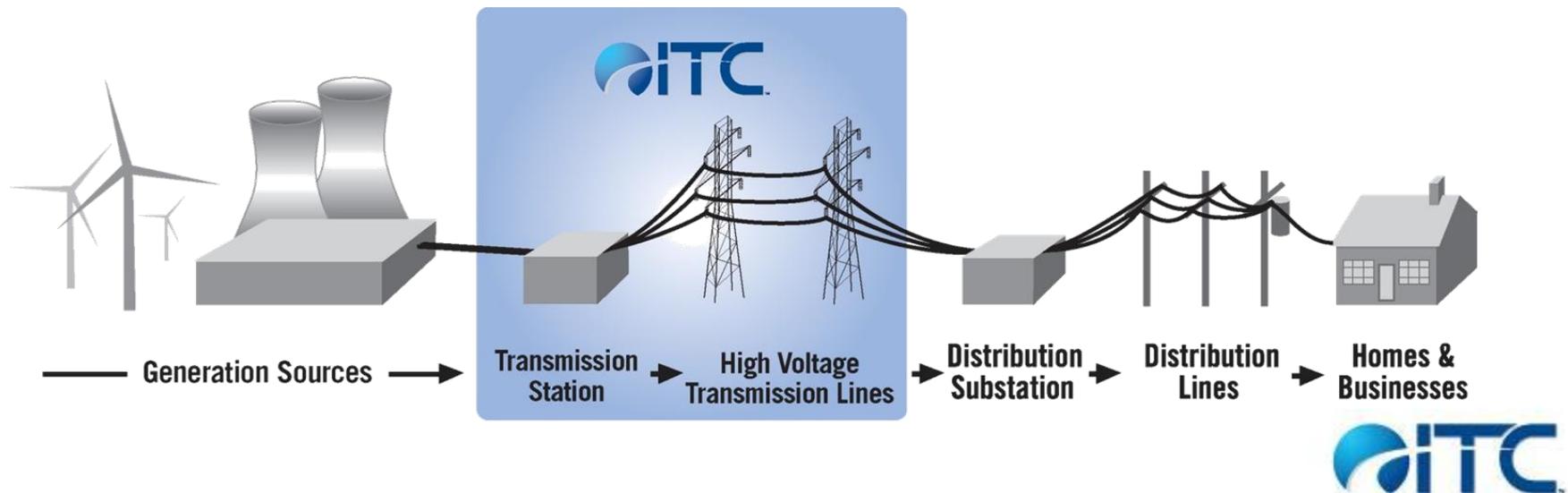
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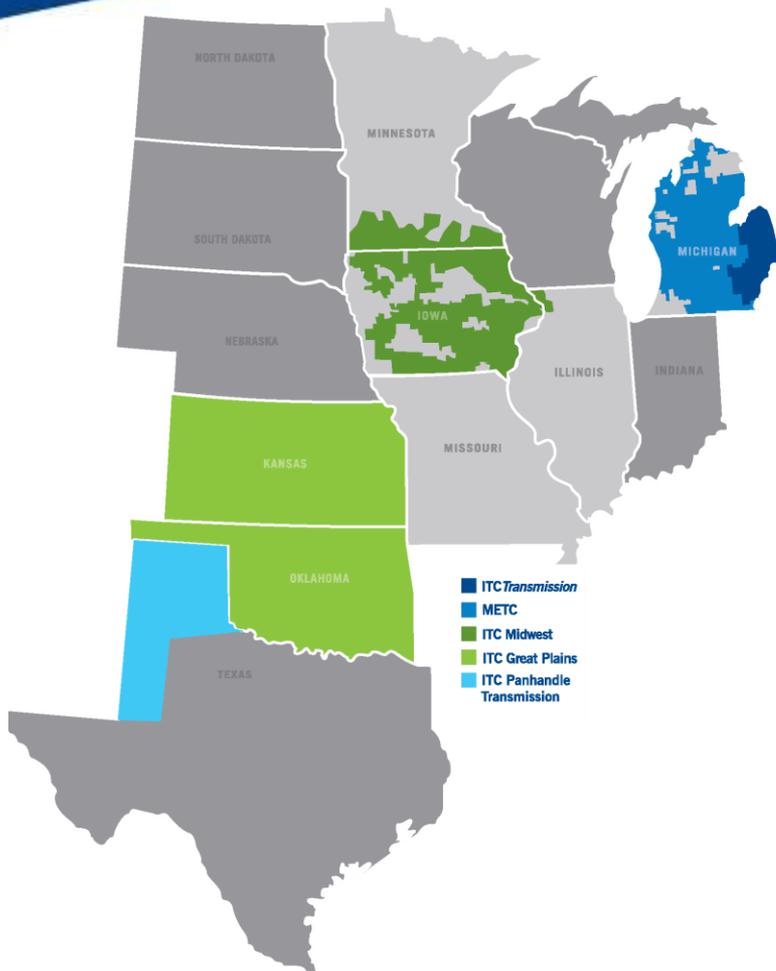
What is Transmission?

The electric transmission system is the network of high voltage lines and towers that transfer electric energy in bulk from power generating plants to substations serving communities and businesses.

ITC's role in the Power Flow Process



ITC: A Transmission-only Utility



- Largest fully independent, **transmission-only** utility in U.S.
- **Fully regulated**, independent transmission model creates a unique approach to infrastructure
 - Investing **solely** in necessary transmission infrastructure
 - **Singular focus** on transmission system performance, planning and operations
 - Aligns with national policy objectives to **facilitate investment** in regional and inter-regional transmission
- More than **15,000 miles of transmission facilities** in five states, serving over 25,000 MW of peak load
- **Actively developing transmission** for reliability needs and emerging long-term energy policy objectives



- Four operating companies in seven states
 - Michigan, Iowa, Illinois, Minnesota, Missouri, Kansas, Oklahoma
- Approximately 500 employees and 500 skilled labor contractors
- Capital investments of ~\$3.2 billion since inception
- Projected investments of ~\$4.2 billion 2012 through 2016
- Member of two Regional Transmission Organizations: MISO and SPP

ITC History



- **March 2003** - Established as ITC *Transmission* with the purchase of Detroit Edison transmission assets
- **July 2005** – ITC Holdings Corp. became first publicly traded independent transmission company
- **July 2006** - ITC Great Plains, headquartered in Topeka, KS, established to pursue new transmission development opportunities in SPP
- **October 2006** - Acquired Michigan Electric Transmission Company (METC)
- **December 2007** - Formed ITC Midwest by acquiring the transmission assets of Interstate Power and Light from Alliant
- **December 2011** - Announced proposed transaction with Entergy Corporation whereby Entergy will spin off its transmission business and merge it with ITC



ITC System Statistics

				
Service Area	<i>ITC Transmission</i>	METC	ITC Midwest	ITC Great Plains
Approx. Total System Peak Load	12,700 MW	9,700 MW	3,700 MW	N/A
Approx. Total Transmission Miles	2,800	5,500	6,600	344*
RTO Membership	Midwest ISO	Midwest ISO	Midwest ISO	SPP
Assets Acquired	March 1, 2003	Oct. 10, 2006	Dec. 20, 2007	Aug. 18, 2009

* 192 miles in service



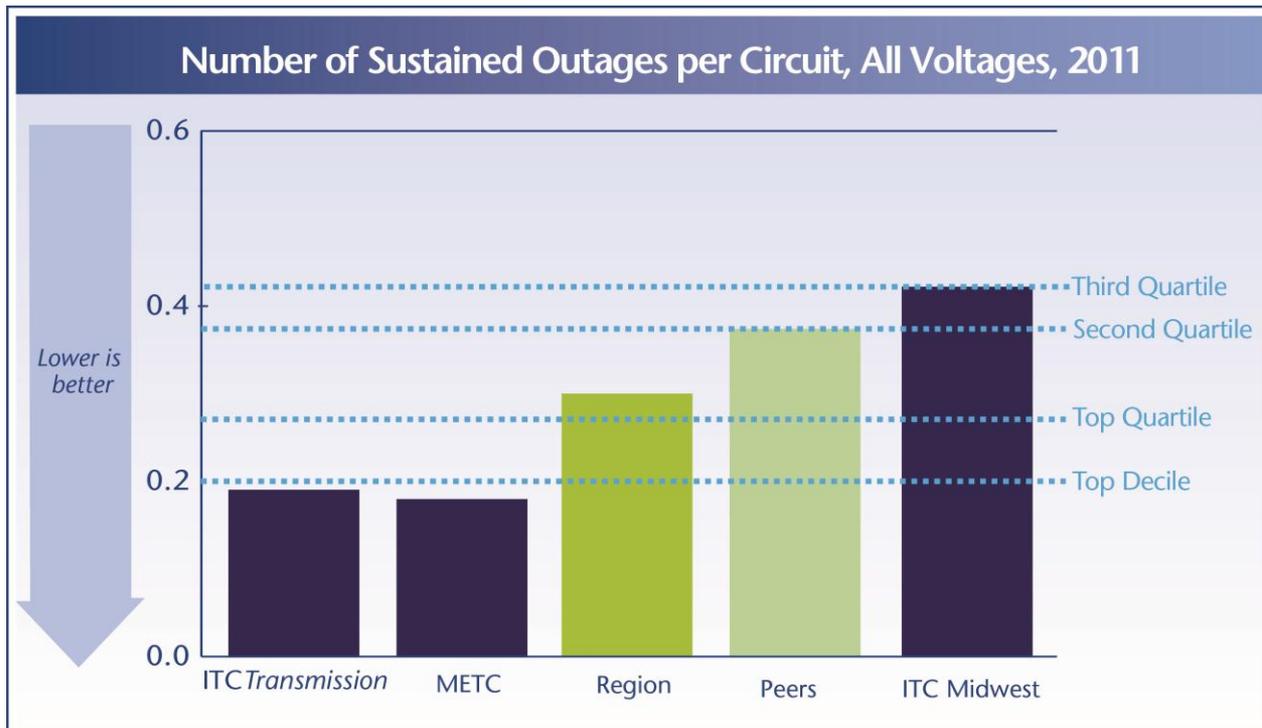
Operational Excellence



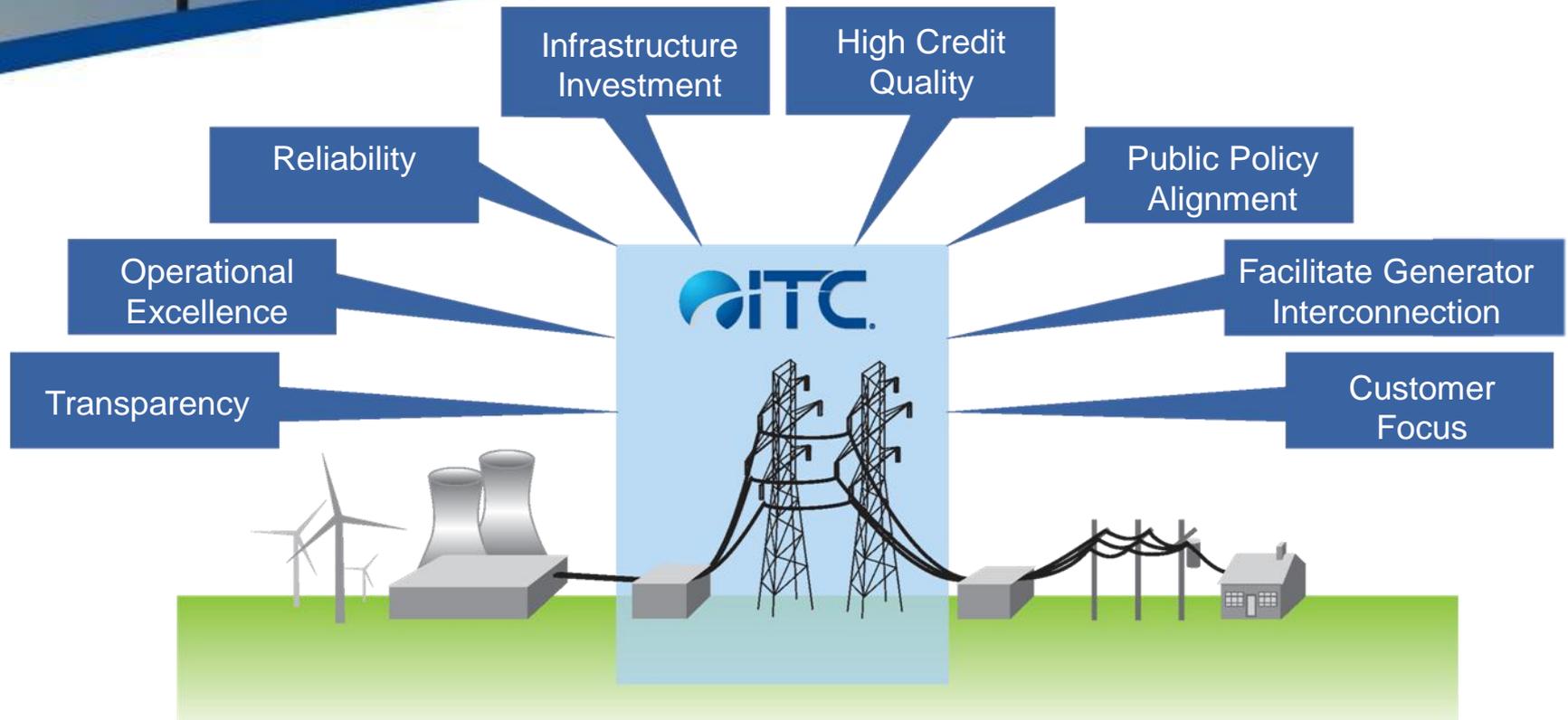
- **ITC's overarching goal:** Best-in-class system operations and performance
- **Culture of safety** and proven record of safety performance
- **Preventative maintenance** emphasized to reduce costly reactive maintenance
- State-of-the art **Operations Control Room** staffed with operators qualified at the highest level under the NERC Operator Certification Program
- Operating companies consistently rank strongly in the SGS Statistical Services Transmission **Reliability** Benchmarking program
- **Restoring power quickly** is a core competency and area of focus for ITC

Operational Excellence: Improving Service Reliability

Fewer and shorter outages: According to the SGS Statistical Services' Transmission Reliability Benchmarking Study, ITC's Michigan operating companies **rank within the top 10 percent** of best rated companies nationally for sustained outages performance per circuit as well as for the average duration of circuit outages. These Michigan systems outperform both their region and their peer group in both categories.



Independent Model



- Proven independent business model for owning and operating transmission systems
- Independence from all buyers and sellers of electric energy allows ITC to plan improvements to the electric transmission grid for the broadest public benefit

How is ITC Regulated?

Federal

- Federal Energy Regulatory Commission (FERC)
- North American Electric Reliability Corporation (NERC)

State and Local

- Public service/utility commissions
- Environmental agencies



ITC's Mission

- Make investments that improve system reliability
- Expand access to energy markets
- Lower the overall cost of delivered energy
- Allow new generating resources to interconnect to transmission systems
- Build a robust, regional grid



Business model serves state, regional, and federal policy goals of advancing transmission infrastructure development to the benefit of consumers.

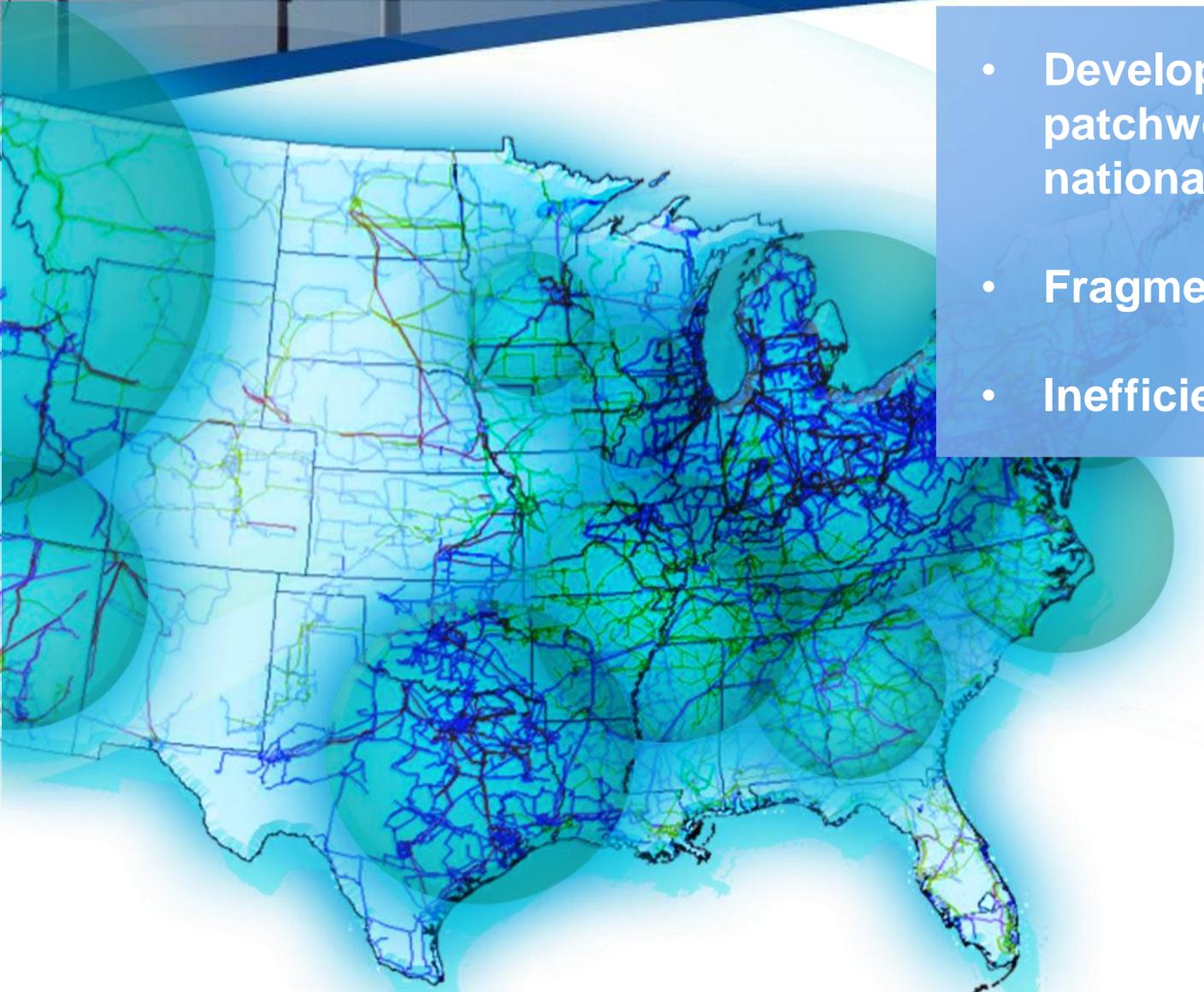
Energy Industry: Today and Tomorrow



- **High Demand:** Electricity demand continues to grow; expected to increase 26% by 2030
- **Generation:** Many base load plants will have to be retired, new forms of generation (wind, solar, biofuels, etc.) will have to be connected to the grid
- **New Demands / Uses:** Demand response, efficiency programs, electric vehicles
- **Policy Focus:** Increased attention to national security, environment and creation of related energy policies

The Existing U.S. Transmission Grid

- Developed city by city in patchwork fashion, not nationally
- Fragmented
- Inefficient

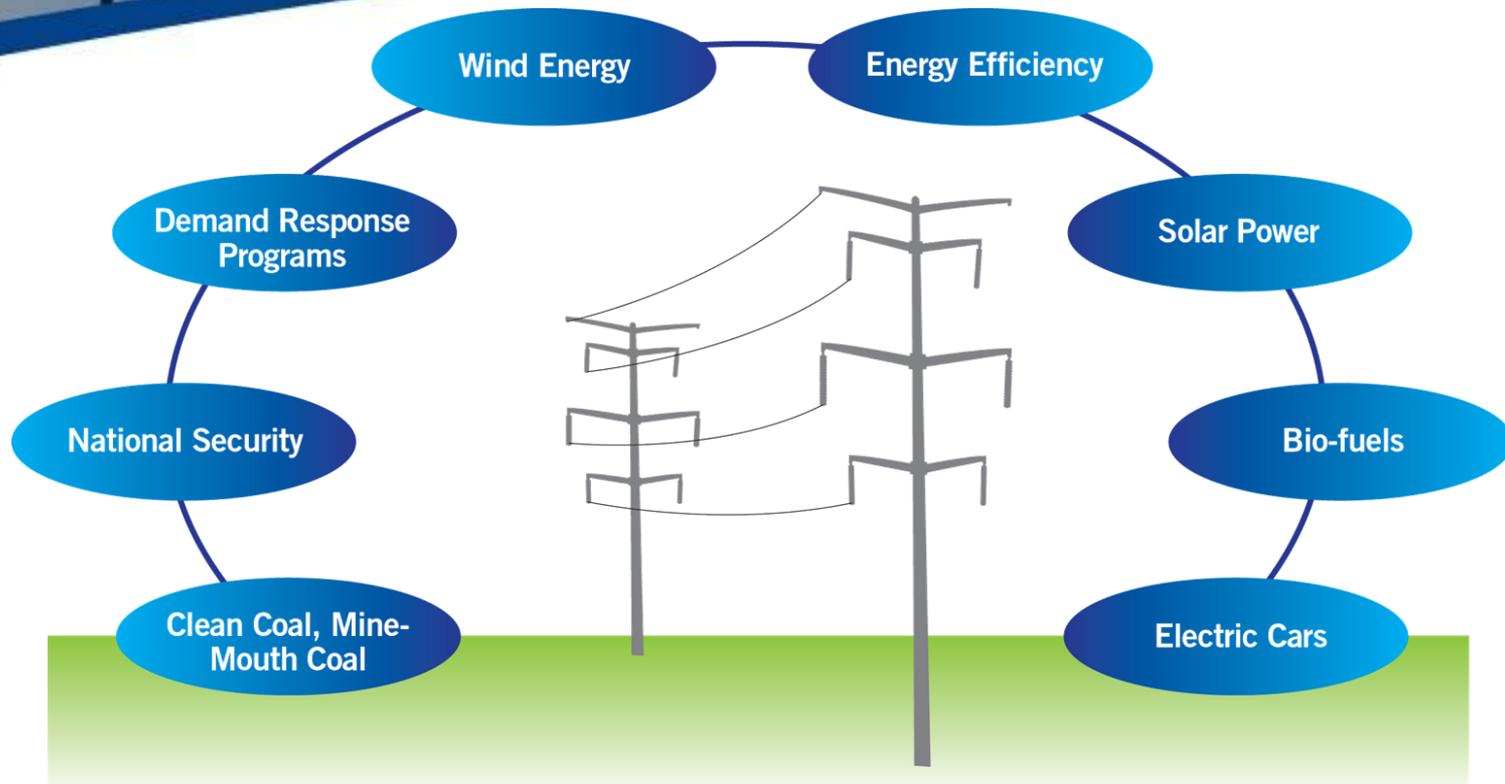


Why Do We Need More Transmission?



- Our outdated power transmission grid saddles residents and businesses with more expensive energy while keeping cleaner, more affordable alternatives out of the market.
- Increased and shifting demand, combined with changing sources and uses of electricity, have put added strain on our electric system.
- To move forward, we need a 21st century model in the form of an interconnected high-voltage transmission network – an energy superhighway.
- Regional transmission development will open energy markets to increased competition, deliver more affordable energy to customers and improve service reliability.
- ITC is committed to investing in the energy infrastructure that is essential for economic development, energy independence and security

Transmission is a Critical Link



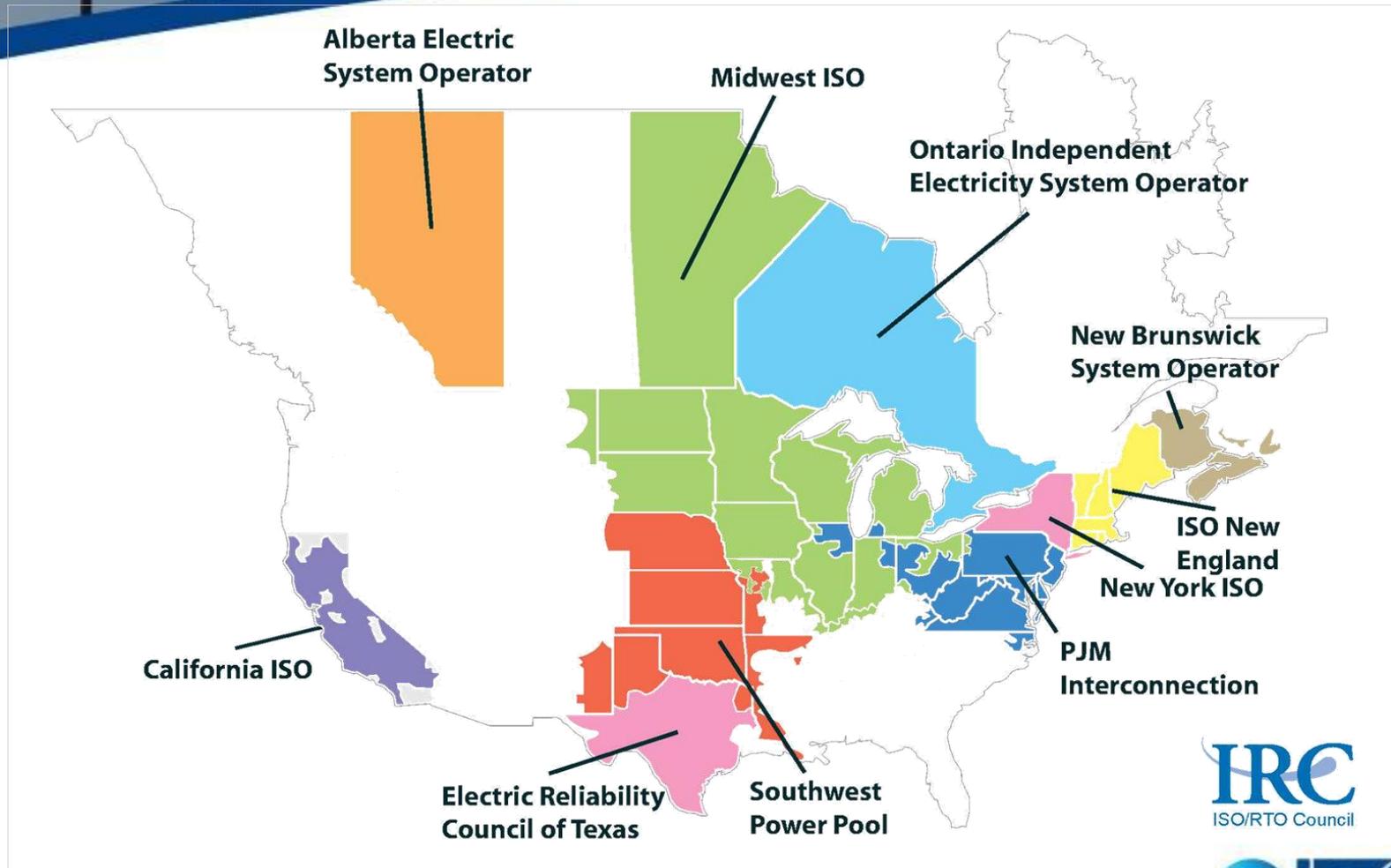
***Transmission is at the center of the energy debate;
it is the critical link to many of the energy policy visions.***



Kansas Siting Act Kansas Electric Transmission Authority (KETA)

- Kansas Siting Act is viewed as a model in the industry. Obstacles with siting transmission lines in other states are not common in Kansas.
- Requires public notice and public meetings with affected landowners.
- Within 120 days of the receiving a siting application, the KCC must make a decision regarding the transmission line permit application
- KETA was created in 2005, to further ensure reliable operation of the integrated electrical transmission system, diversify and expand the Kansas economy and facilitate the consumption of Kansas energy through improvements in the state's electric transmission infrastructure.
- KETA's primary function has been to facilitate the planning of transmission lines.
- 7 member committee with 4 legislators and 3 appointments by the governor.

Regional Transmission Organizations



Southwest Power Pool

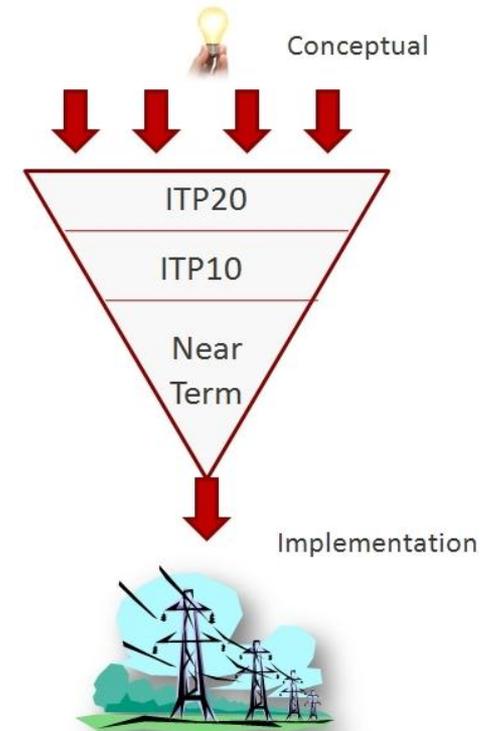


- **“Air traffic controller”** for the regional electric power grid -- operates the regional grid minute-by-minute to ensure that power gets to customers
- Members in nine states
- More than 48,000 miles of transmission lines
- One of nine Independent System Operators/ Regional Transmission Organizations mandated by the Federal Energy Regulatory Commission (FERC) to ensure:
 - Reliable supplies of power
 - Adequate transmission infrastructure
 - Competitive wholesale prices of electricity.
- A robust system that:
 - Improves reliability
 - Improves access to lower-cost generation by reducing "bottlenecks" on the grid
 - Helps bring renewable wind and solar energy to the grid.



SPP Planning Process

- SPP Integrated Transmission Planning Process Consists of Three Major Prongs
 1. ITP20 – conceptual vision for long-term future of the grid, based on alternate future scenarios 20 years out
 2. ITP10 – intermediate “bridge” from near term needs to long-term needs, based on subset of 20-year future scenarios scaled back to 10 years
 3. ITP Near Term – primarily reliability based needs of the grid for the next four years
- Complements SPP generation cluster studies and aggregate transmission service studies – intended to “streamline” those processes



Transmission: AC & DC

- The high-voltage grid is an AC (alternating current) system with many line segments and interconnections
- DC (direct current) technology is appropriate for transporting energy long distances between two specific points
- AC offers regional benefits because it is an integrated system:
 - An AC line is like a highway, with multiple interconnections to the regional grid that act as on- and off-ramps
 - A DC line is more like a tunnel, with an entrance and an exit but no interconnections along the line.
- An integrated AC line provides grid operators multiple paths to move power around the system, improving regional reliability

Regional High-Voltage Grid Pre-2006



Key ITC Great Plains Projects

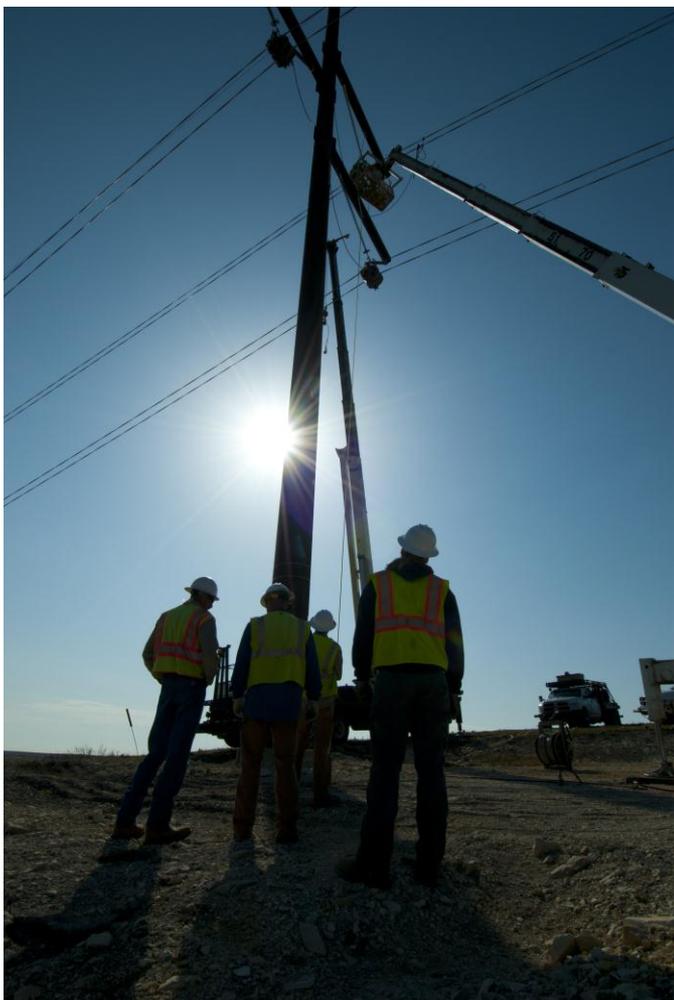
 <p>Hugo to Valliant</p>	 <p>KETA</p>	 <p>Kansas V-Plan</p>
<p>18 mile, 345kV line and new substations</p>	<p>225 mile, 345kV line; ITC's portion is 174 miles</p>	<p>180 mile, 345kV line; ITC's portion is 122 miles</p>
<p>Complete and in service June 2012</p>	<p>Phase 1 line, Post Rock substation & Spearville substation addition complete and in service June 2012</p>	<p>Received siting approval for project in July 2011; ROW acquisition underway</p>
	<p>Phase 2 completed and in service December 2012</p>	<p>In service late 2014</p>

KETA Project Overview



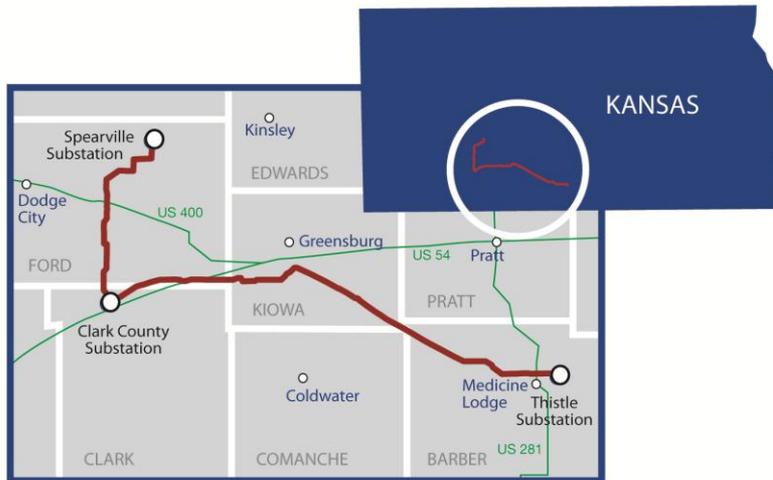
- 345,000 volt (345kV) single-circuit transmission line to **improve the reliability** and efficiency of the regional grid
- **Ease congestion** across the transmission network – SPP identified benefits of **\$111-131 million/year** for Balanced Portfolio Projects including KETA
- Provide access to more reliable, efficient and affordable electricity
- Address the **lack** of high-voltage transmission lines in central and western Kansas
- Collaboration with local Kansas utilities – **Sunflower Electric Power Corporation** and **Midwest Energy**
- Approx. **225 miles** from Spearville north to the Post Rock substation near Hays, to Axtell, Nebraska

KETA Impact



- General contractor **MYR Group** of Marshalltown, Iowa, employed an average of 55 skilled trades workers (75-80% Kansans) for line construction Nov. 2010-Dec. 2012.
- MYR Group employed an average of 14 skilled trades workers on the construction of the **Post Rock substation** over a period of seven months.
- Numerous local suppliers & vendors for concrete, fuel, lodging, food, etc.
- During construction, contractors estimate their employees spend about \$7.50 for every hour they work in an area.

V-Plan Project



- **Double-circuit, 345 kV** transmission line connecting eastern and western Kansas
- Contribute to a **stronger transmission grid** that will benefit the entire region by increasing efficiency and **reliability**
- Enable energy developers to tap into the transmission grid, further establishing a **competitive energy market** in the state
- SPP identified benefits of Priority Projects including V-Plan at **\$1.5 billion** in SPP region over 40 years
- Collaboration with local Kansas utilities – **Sunflower Electric Power Corporation** and **Mid-Kansas Electric Company**
- Approx. **122 miles** through Ford, Clark, Kiowa and Barber counties
- Began construction in Barber County **Nov. 2012**
- In service late **2014**

Regional High-Voltage Grid Pre-2006 & Today

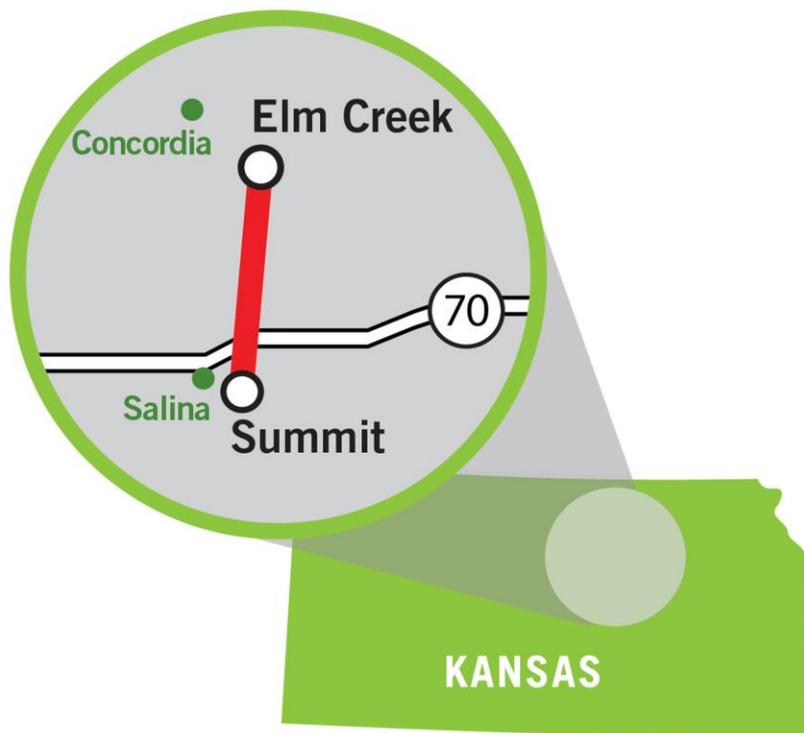


Pre-2006



Today

Future Great Plains Projects



Elm Creek-Summit

- A new 60-mile, 345,000-volt (345 kV) transmission line to improve the **reliability** of the grid in central Kansas
- Link 345 kV Summit Substation southeast of **Salina** to a new 345 kV substation southeast of **Concordia** near existing 230 kV Elm Creek Substation
- ITC co-development agreement with **Mid-Kansas Electric**: ITC Great Plains will construct, co-own with MKEC and operate the northern section of the line
- **Westar** Energy will construct, own and operate the southern section
- Scheduled to be complete and in service in **2018**

Future Great Plains Projects



Great Plains Expansion Project

- Planning began more than a year ago in the interest of moving larger amounts of energy from the central U.S. region to eastern portions of the U.S.
- Recently submitted in response to SPP's request for proposals to facilitate the movement of excess energy capacity from the SPP region to points east
- Draws on ITC's track record as a best-in-class independent transmission developer and operator - - success of existing projects and partnerships with local utilities
- Package of five 345 kV AC transmission lines consisting of multiple west-to-east segments
- Originate in Nebraska, Kansas, Oklahoma and Texas
- Terminate in Iowa, Missouri and Arkansas
- Total length approximately 2,700 miles in seven states
- Partnering with Sunflower Electric Power Corp.

Thank You!

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