



BUILDING A CLEAN ENERGY FUTURE

November 2019

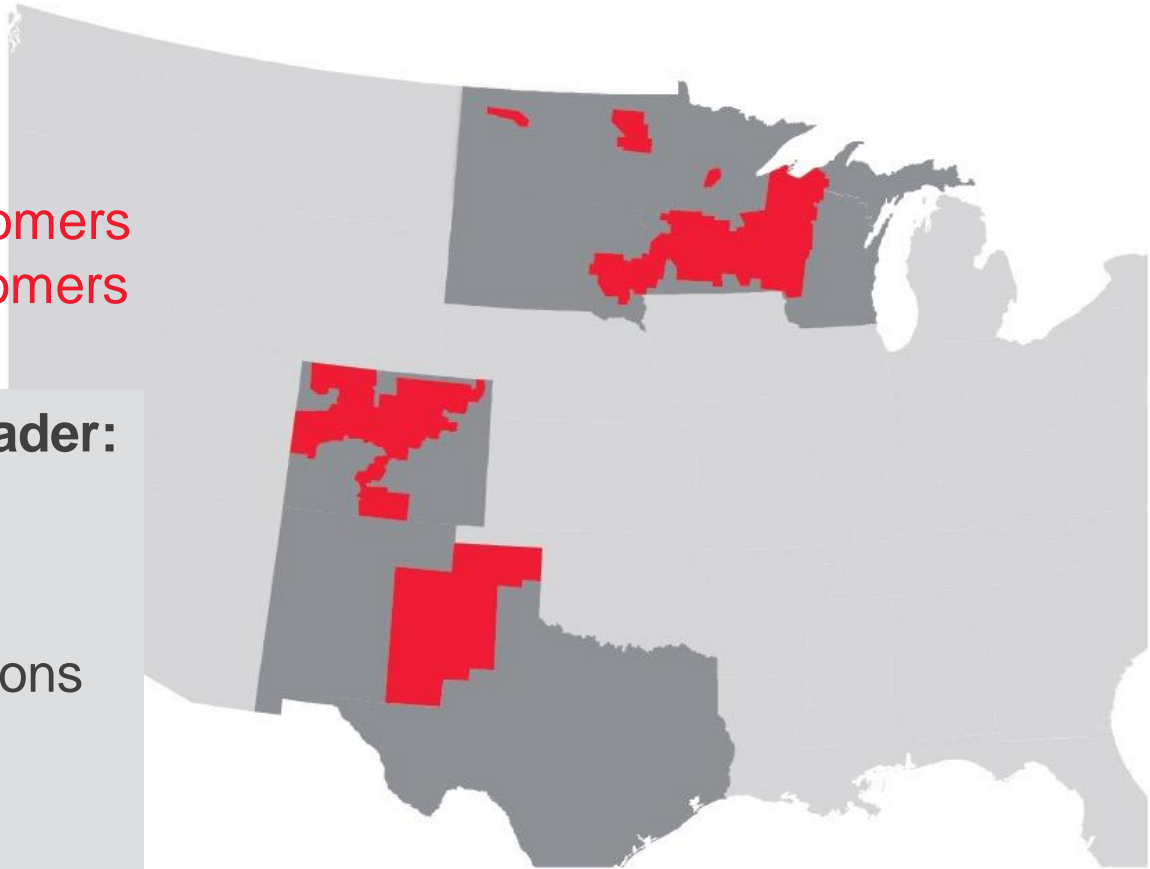
Xcel Energy

Serving eight states

- 3.6 million electricity customers
- 2 million natural gas customers

Nationally recognized leader:

- Wind energy
- Energy efficiency
- Carbon emission reductions and reporting
- Innovative technology



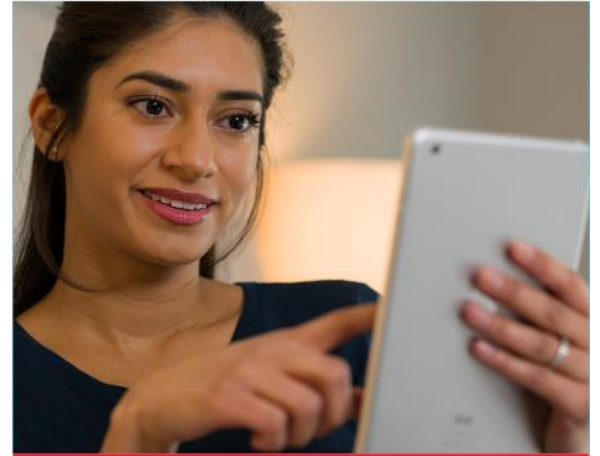
Xcel Energy Priorities



Lead the Clean
Energy Transition



Enhance the
Customer Experience

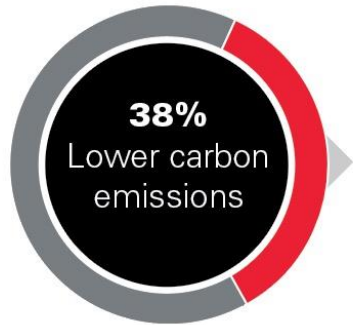


Keep Bills Low

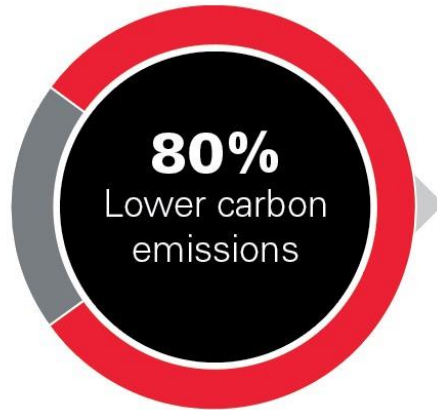
Leading the Clean Energy Transition

A bold vision for a carbon-free future

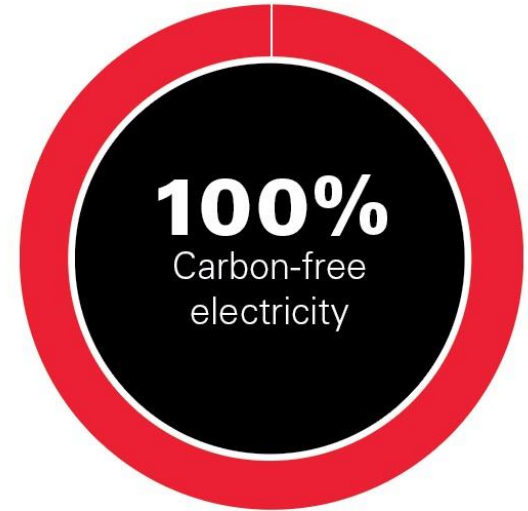
2018 Results



2030 Goal

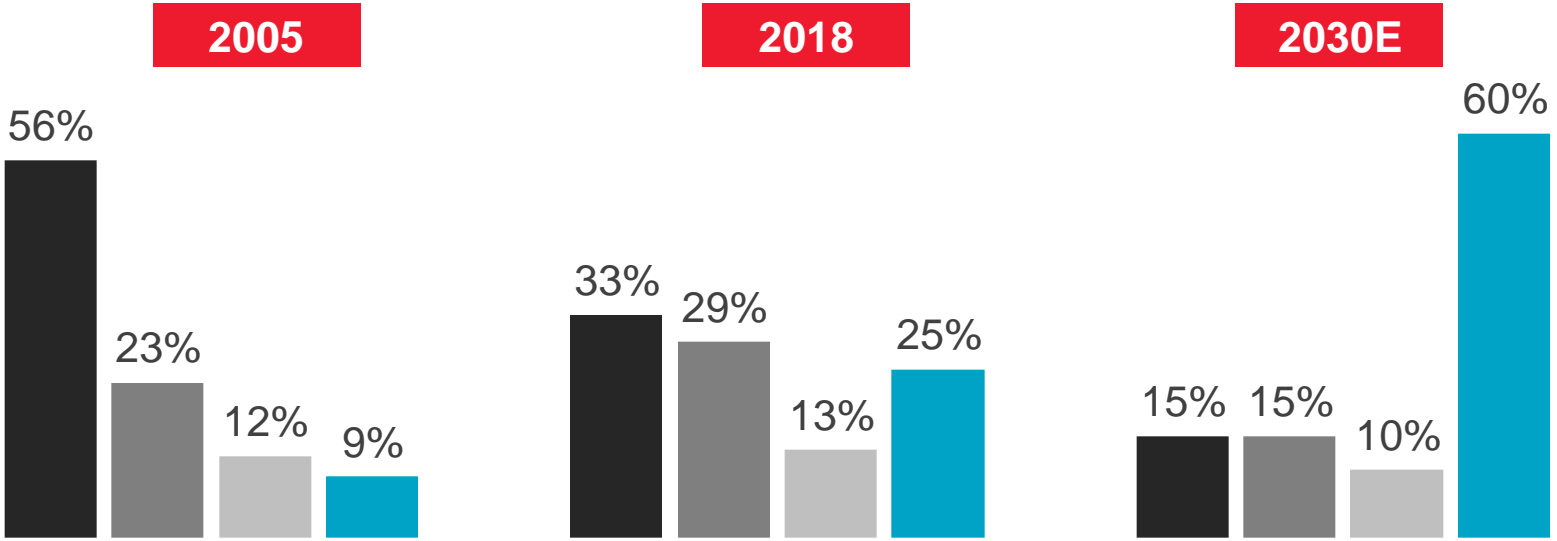


2050 Vision



Company-wide emissions reductions from the electricity serving our customers, compared to 2005

Evolving Energy Mix

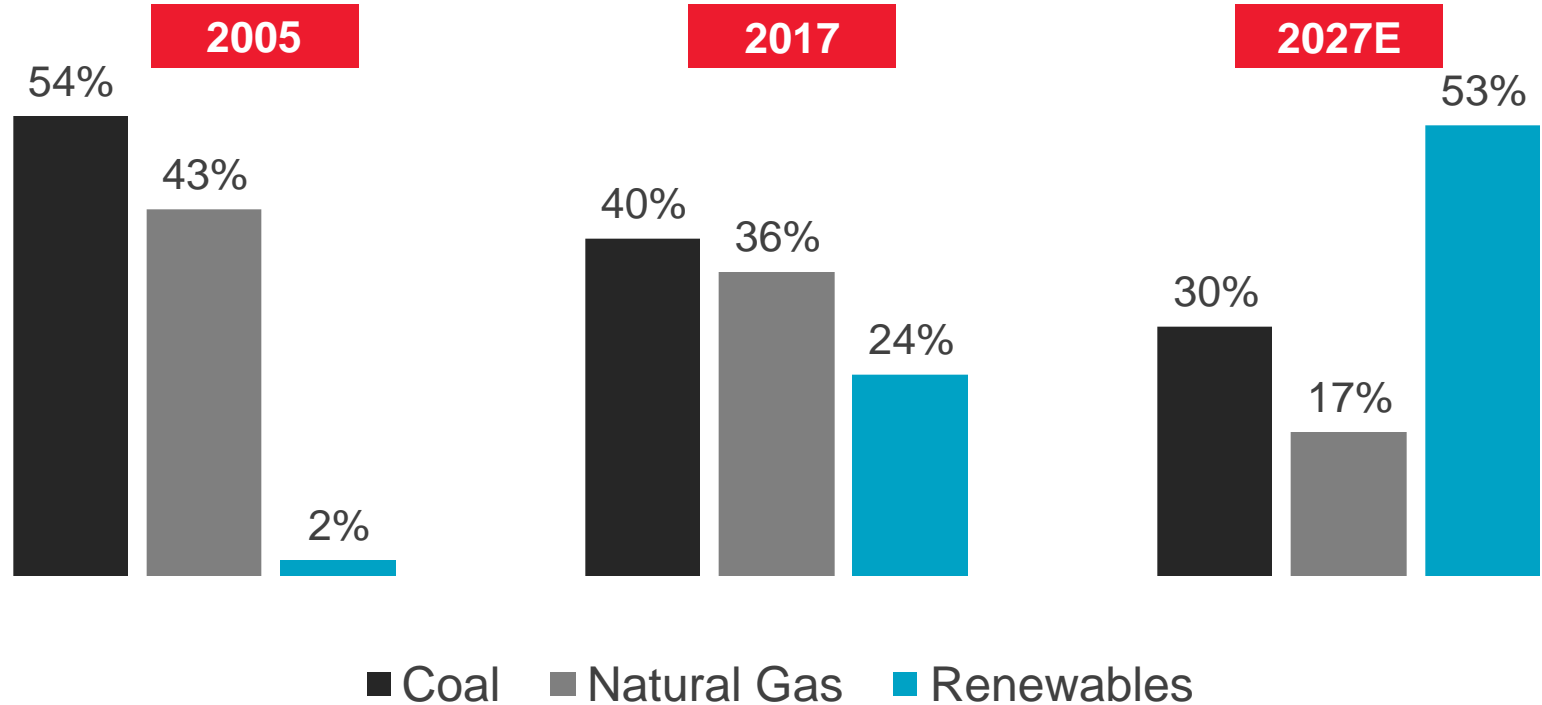


Results are estimated and reflect potential scenarios that achieve 80% by 2030; actual system depends on various factors, including regulatory approval of future plans

■ Coal ■ Natural Gas ■ Nuclear ■ Renewables

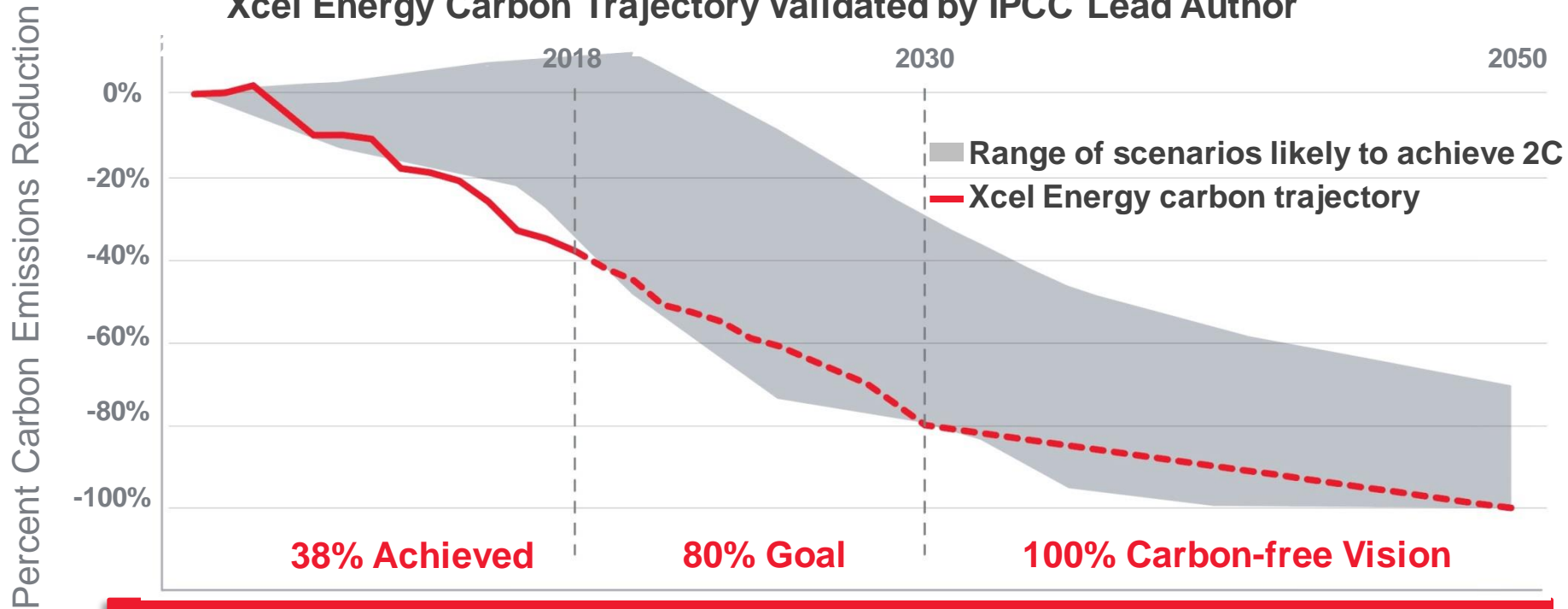
Increasing Renewables on the Grid

Southwest



Goals Grounded in Science

Xcel Energy Carbon Trajectory Validated by IPCC Lead Author



Goals align with Paris agreement temperature targets

Path to 80% Reduction by 2030

Affordably and reliably with current technology

- Increase renewables
- Natural gas and energy storage
- Preserve nuclear
- Transition coal fleet
- Energy efficiency
- Strategic electrification
- Invest in the grid



Plans that Support the 2030 Goal



Colorado

- Colorado Energy Plan
- Upcoming clean energy plan under SB19-236



Upper Midwest

- Proposed energy plan filed July 2019
- Commission decision expected late 2020



Southwest

- Wind energy expansion
- Texas stakeholder discussions
- New Mexico Energy Transition Act

Path to 2050 Aspiration

Depends on 24/7 Carbon-free Technology

Possibilities:

- Natural gas with carbon capture and storage
- Deep rock geothermal
- Power to gas
- Advanced nuclear
- Seasonal storage
- Others

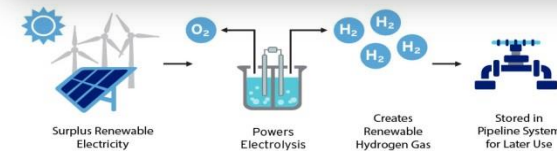
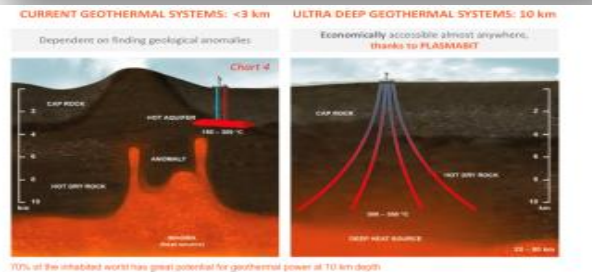
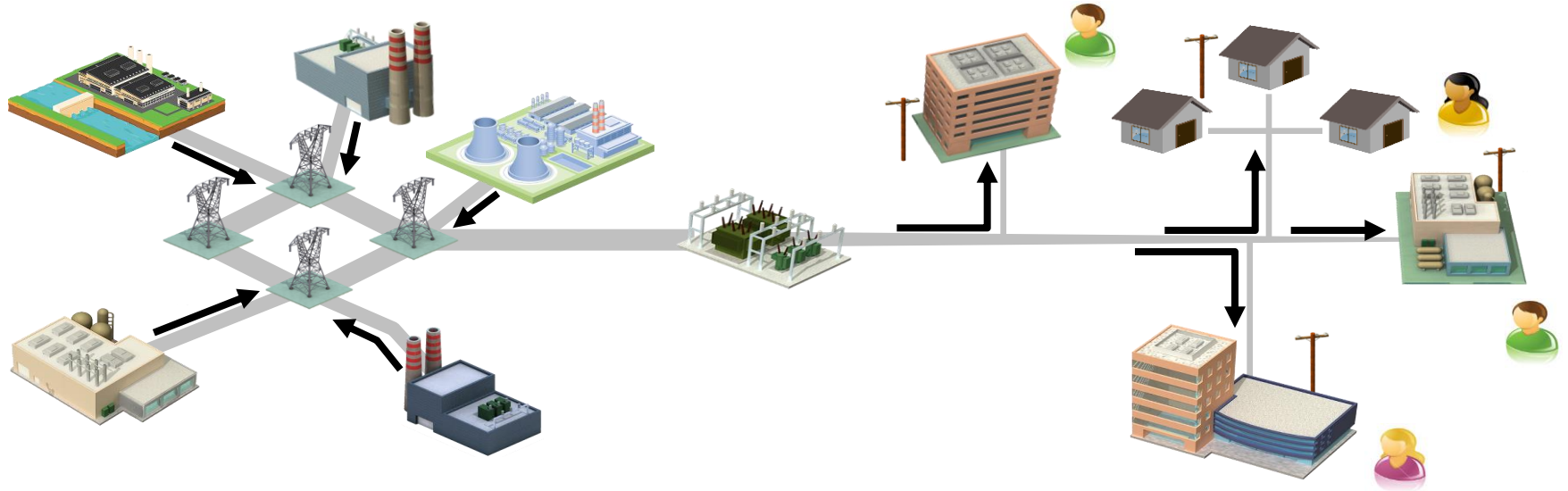


Diagram Courtesy of SoCal Gas

Advanced Grid Overview

Yesterday's Power System ...

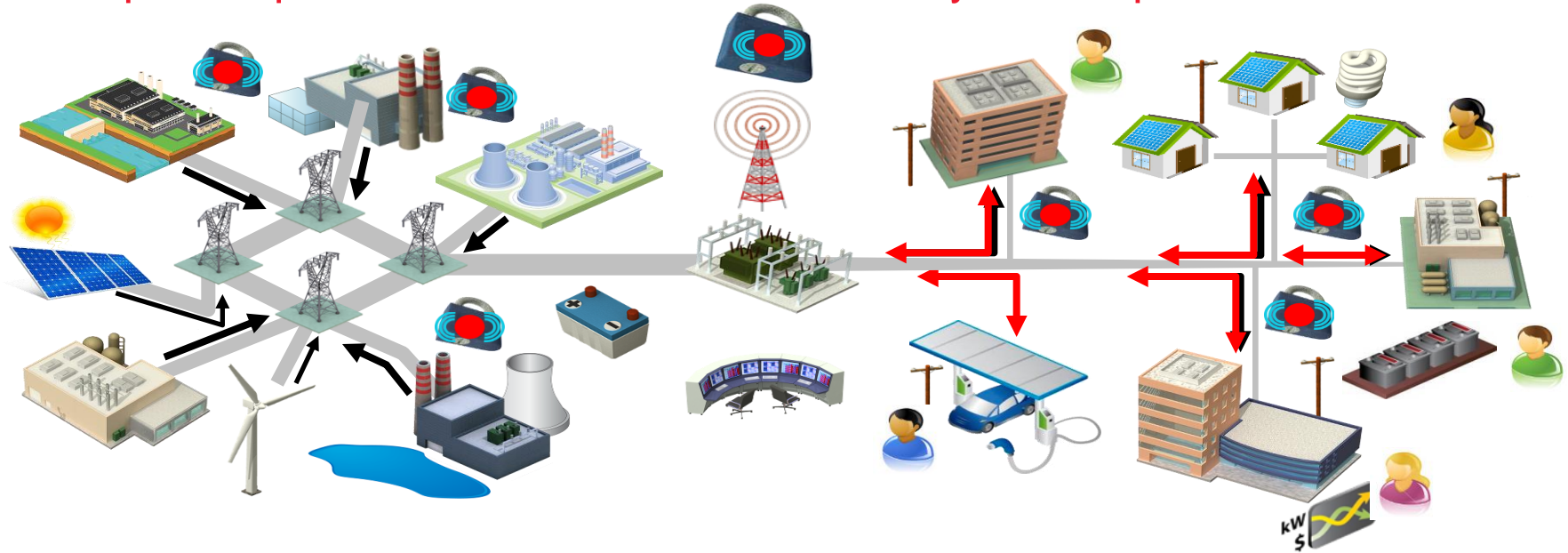
is evolving, creating new opportunities for products and services



Central generation, one-way power flow, passive consumers

Tomorrow's Power System ...

will require expertise and know how in a variety of disciplines



Distributed generation and storage creating two-way power flow

The Broader Context – Advanced Grid Programs



Advanced Metering Infrastructure

Installs new meters on Xcel Energy customer premises to collect data, provide remote interaction, and facilitate customer connection.



Network

Develops the Field Area Network to allow Xcel Energy grid devices to communicate, facilitate remote interaction, and grid management.



Grid Visibility & Control

Provides the devices & interface for Xcel Energy to manage grid systems, increase visibility to system performance, and troubleshoot issues.

Customer Premises: WHAT is changing?



Advanced Meters



Demand for new customer smart energy services



Increased deployment of distributed energy resources



Movement towards data-driven internet of things



Integrated Volt-VAr Optimization



Need to effectively manage voltage on the grid



Creating cost savings for customers and Xcel Energy



Regulatory requirements for operations and efficiency



Distribution Line: Fault Location, Isolation, and Service Restoration (FLISR) – WHAT is changing?



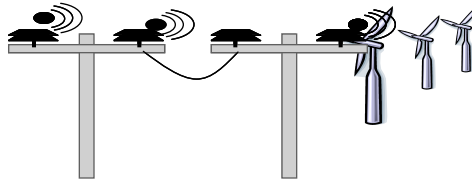
Decreased customer outage time



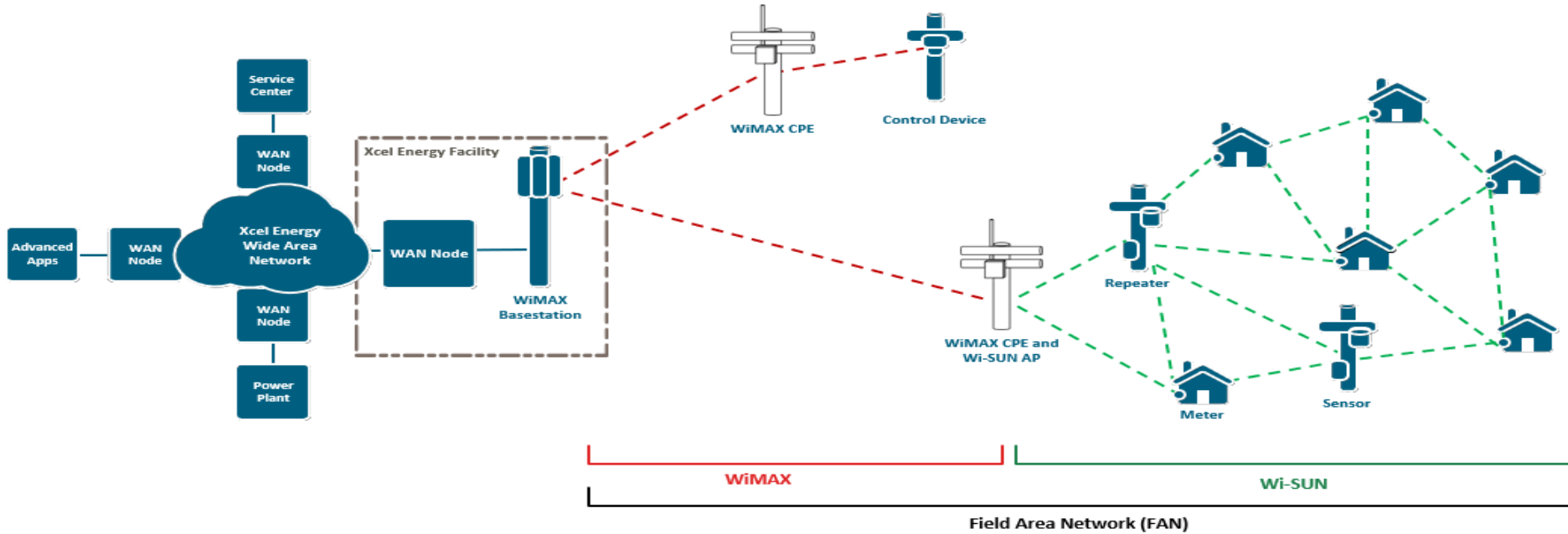
Quicker fault location identification for field crews



Increased power restoration to customers during fault repair



Advanced Grid Field Area Network (FAN) View:



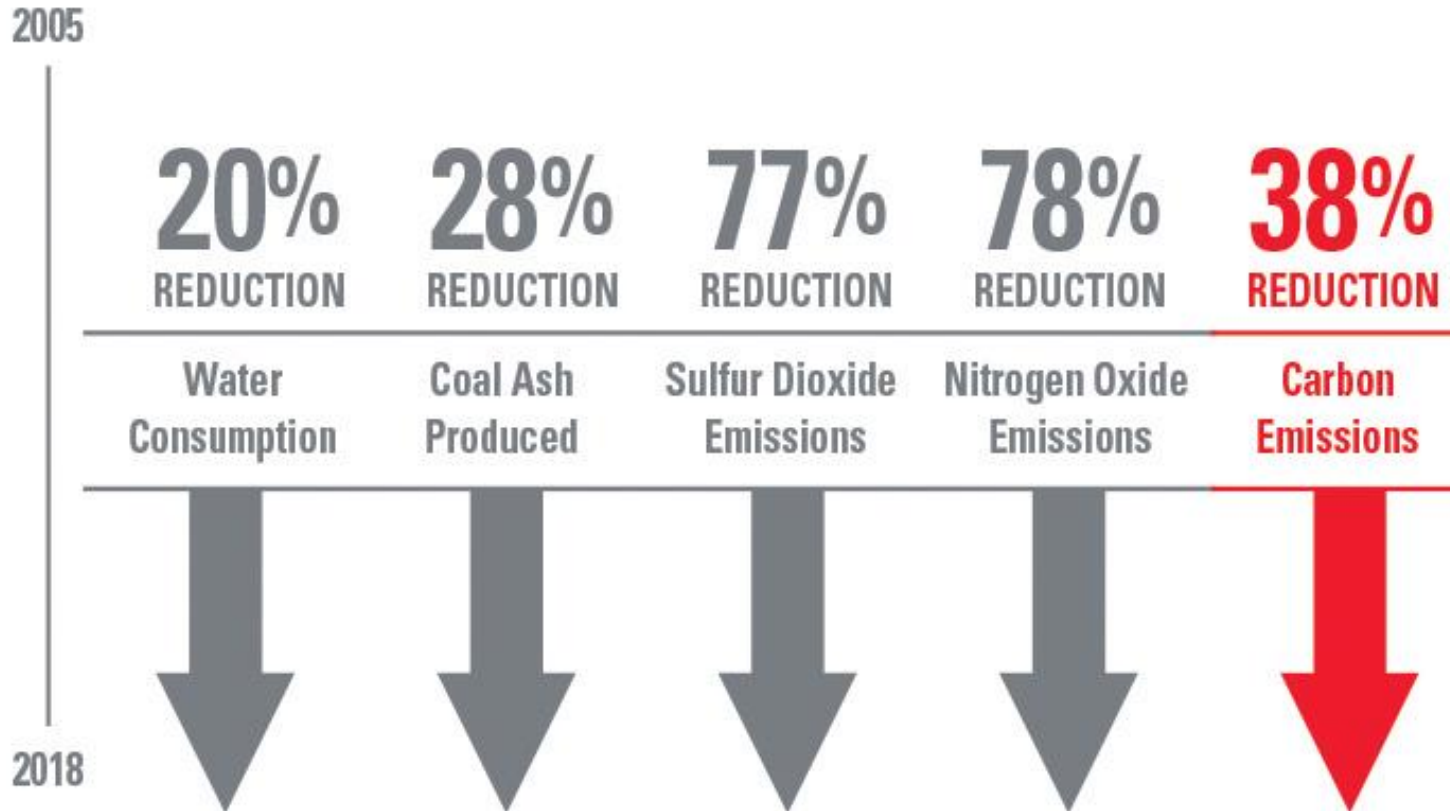
Looking to the Future

Achieving our Clean Energy Vision

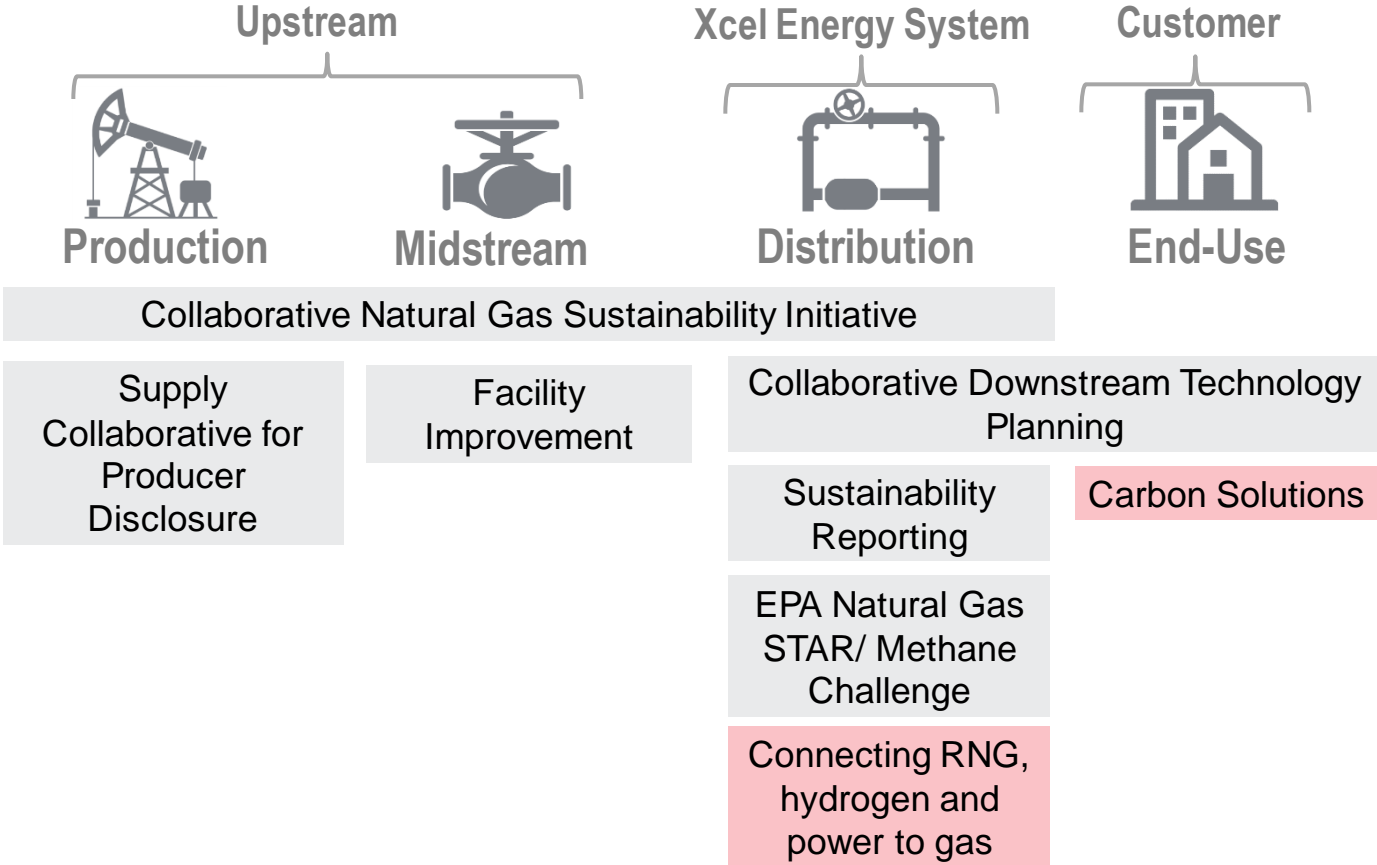
Reducing carbon emissions is job #1

- Protect energy reliability and affordability**
- Support from our states and stakeholders**
- Advocate for constructive public policy**
- Develop carbon-free 24/7 technologies for 2050**

Environmental Benefits

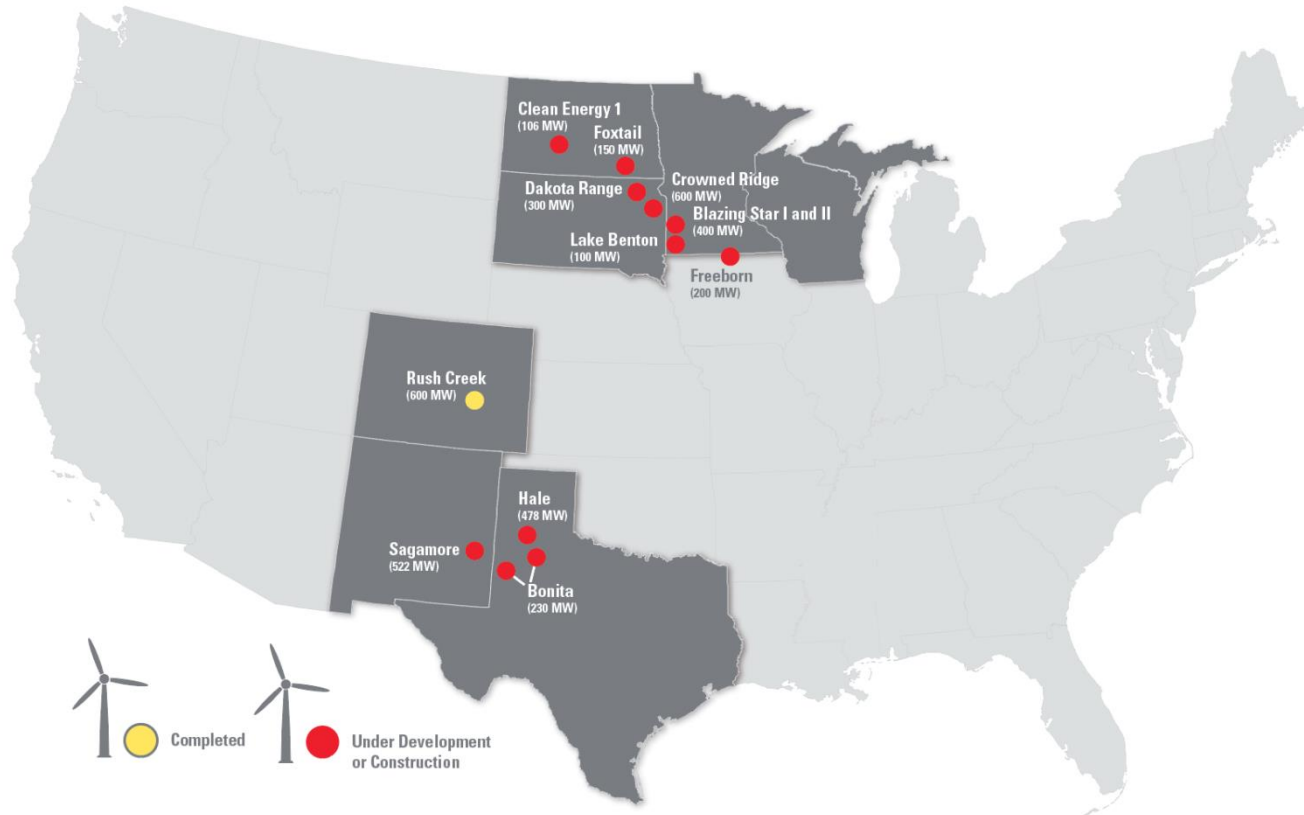


Reducing methane and carbon emissions



Steel for Fuel

Nation's largest multi-state wind investment



Strategic Electrification

Enabling new opportunities



Electrification objectives:

- Save customers money
- Reduce emissions
- Improve power grid efficiency

Strategic Electrification

A solution for reducing carbon economy-wide

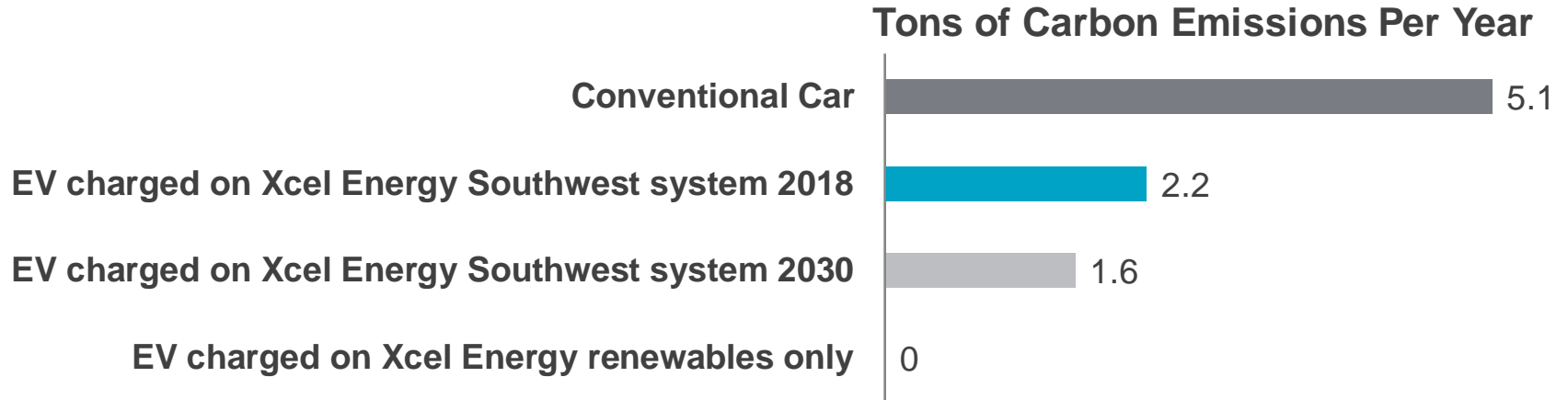
Xcel Energy EV strategy:

- Making EV adoption easier
- Creating charging infrastructure
- Establishing rates and technology to encourage charging on low-cost, low-carbon energy



~2 million EVs projected in Xcel Energy territory by 2035

Driving electric is clean today, even cleaner in the future



Source: U.S. Environmental Protection Agency and Xcel Energy

