

A New Frontier

(it's all about electrification)

Gary Connett

Director, Member Services

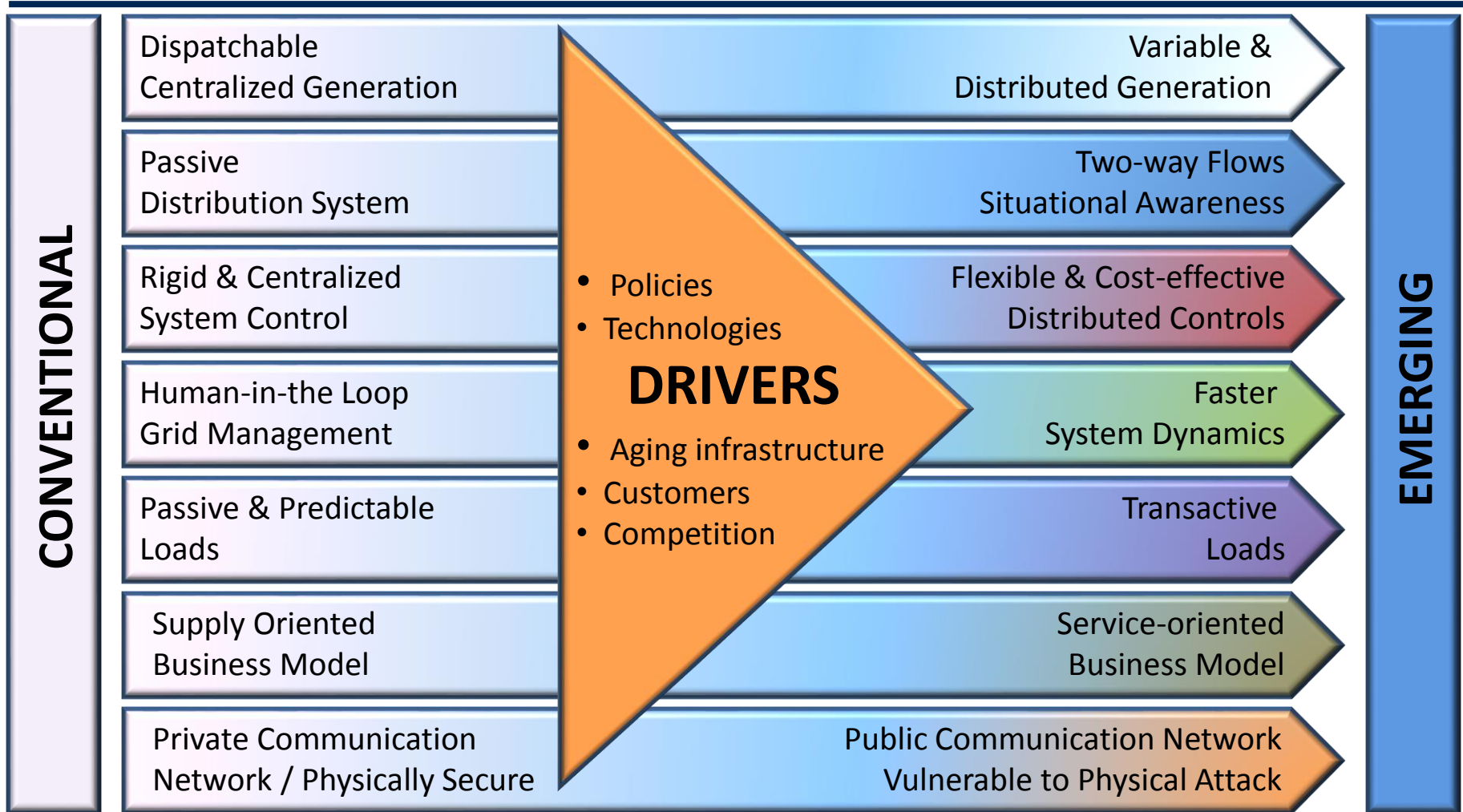
The future is electric

- ▶ Electricity will:
 - ▶ Come from renewable, sustainable resources
 - ▶ Take the lead in decarbonizing the country
 - ▶ Dominate transportation and heating

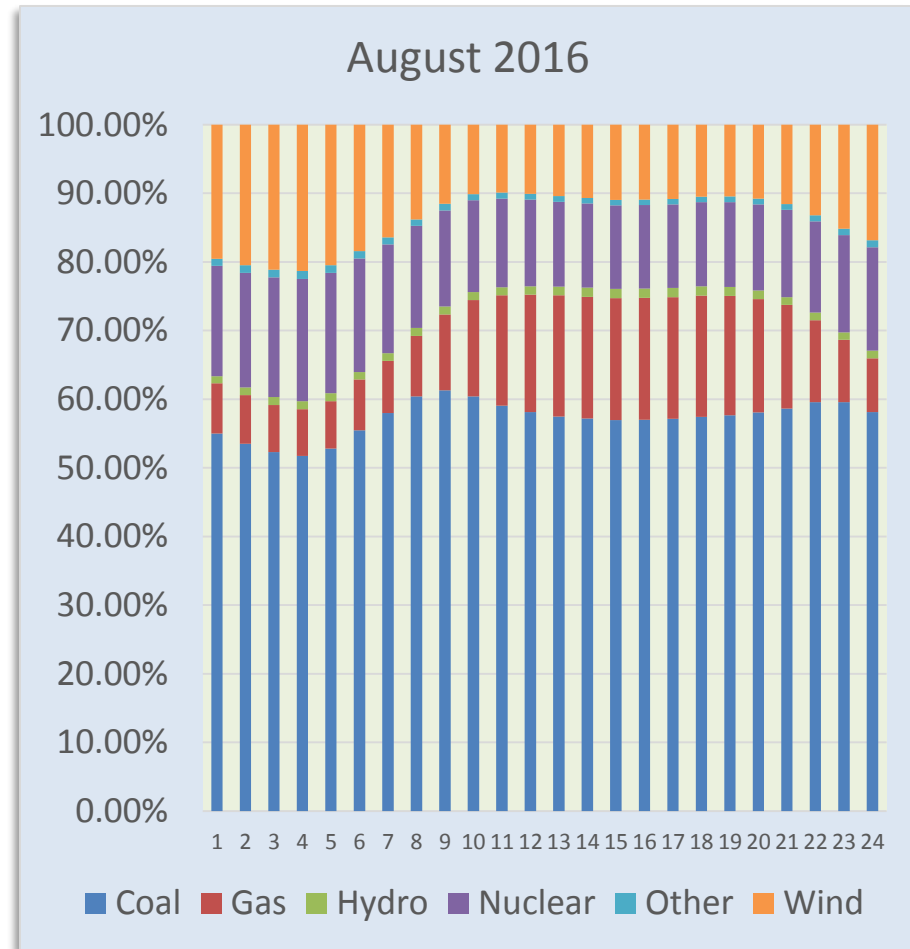
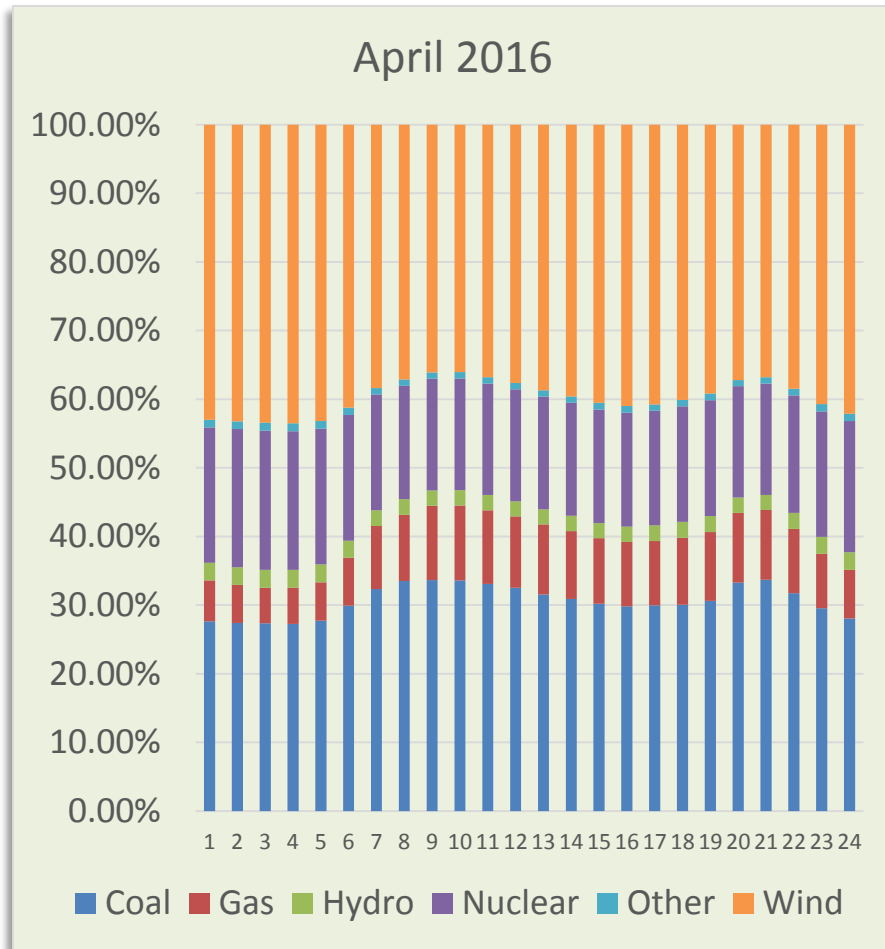
Utilities must take a proactive role.



Utility industry trends



Generation mix by hour (MISO North)



Community Storage

- ▶ First “Community Storage” housing development
 - All homes have grid-interactive water heaters
- ▶ Also includes:
 - EV charging stations in the garage
 - LED lighting upgrades
 - Air source heat pump upgrade
- ▶ Cell modems installed in water heater initially
 - Evaluate other communications as the project moves forward
 - Lora 900 MHz System

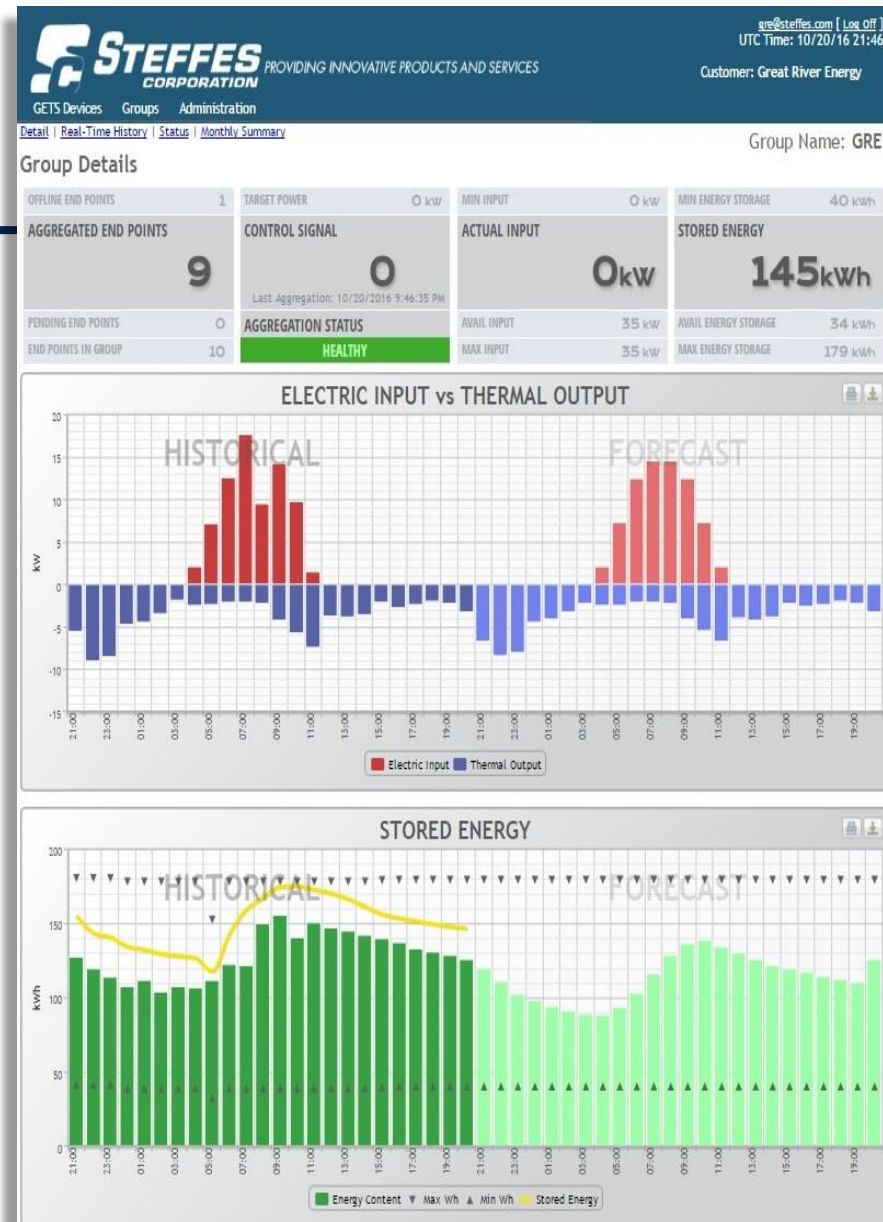
Legacy 2nd
Lakeville, MN


COUNTRY JOE
HOMES



Grid interactive water heating

- ▶ 85 gallon water heaters
- ▶ Adjusts temperature in response to:
 - Market energy price
 - Availability of renewable energy
- ▶ Able to provide ancillary services
 - 4 second response rate
- ▶ Assures comfort is never compromised



West Central Research and Outreach Center's Green Ag Initiative

▶ Reduce fossil-fuel consumption through:

- Renewable energy generation
- Energy conservation
- Energy optimization

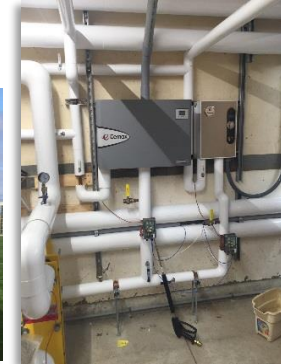
▶ On site:

- Wind turbines
- Solar PV
- Solar thermal
- Cows and pigs



Is Net Zero possible?

- ▶ Make electric loads as efficient as possible or practical
 - VFD drives, LED lights, scroll compressors, etc.
 - Watch for waste and quick fixes that become permanent
- ▶ Convert all thermal loads to electric
 - Heat pumps
- ▶ Add renewable energy systems and storage to meet demand



revolt

EMBRACE ELECTRIC VEHICLES



Why electric vehicles?

WIN

Our
Members

WIN

Our Business

WIN

The
Environment

WIN

The Local
Economy

Beneficial Electrification

Empowers GRE to:

- ▶ Meet strategic goals
- ▶ Change the discussion
- ▶ Increase beneficial sales
- ▶ Be part of the solution
- ▶ Engage in efforts widely supported by stakeholders

