



Sustainable Breakfast Series

Tues, Sept 29 at 8:30AM

**Our Local Energy Grid:
Safe, Reliable, Affordable
& Sustainable**





Learn | Connect | Take Action

July - September: New & Renewing Members

RINKA+



Accurate-Airtight
Exteriors

FOODFIGHT®
RESTAURANT GROUP



Invest Microfinance

Willy Street Coop

Pellitteri Waste Systems

The River Food Pantry

Green Box, LLC

YWCA Madison

Village of McFarland

Uniek, Inc

True North Collective

UW Office of Sustainability

JP Cullen

Sun Prairie Area School District

Middleton Chamber of Commerce

SmithGroup

Downtown Madison Inc

Wisconsin Green Muslims

Society of St. Vincent de Paul

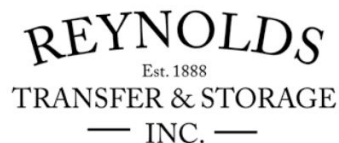
+ 6 individuals

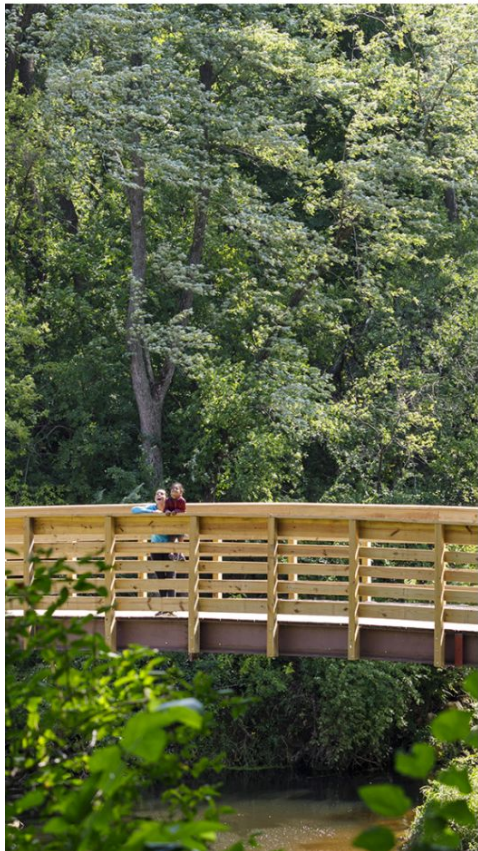
Thank you to our supporting members & partners

Accurate-Airtight Exteriors	Goodwill	Middleton Chamber of Commerce	SmithGroup
Adobe Acrobat	Great Dane Pub & Brewing	Midvale Community Lutheran	Summit Credit Union
Aldo Leopold Nature Center	Company	Miron Construction Inc.	Sun Prairie Area School District
American Family Insurance	Green Box, LLC	Morgridge Center for Public Service	Sun Vault Roofing
Catalent	Greater Madison Chamber of	Mundo Esperanza	TDS Telecom
Christ Presbyterian Church	Commerce	New Year Investments	TLJ Coaching and Consulting
City of Fitchburg	Green Life Trading Co.	Noel Development	TrueNorth Collective
City of Middleton	Greenlink Energy Solutions	Nowlan Personal Injury Law	Uniek, Inc.
City of Sun Prairie	Habitat for Humanity	Overture Center for the Arts	Urban Triage
City of Stoughton	Habitat Holistic Systems	Pellitteri Waste Systems	UW-Madison Office of Sustainability
Common Grace	Henry Vilas Zoo	Placon	Village of McFarland
Covenant Presbyterian Church	Holy Wisdom Monastery	Promega	Village of Mount Horeb
Dane Buy Local	Ian's Pizza	Purevant Living	Village of Shorewood Hills
Dane County Extension	Kahler Slater	Ralph K Morris Foundation	Village of Waunakee
DC Engineering	Klein's Floral and Greenhouses	REAP Food Group	Willy Street Coop
Destination Madison	KL Engineering	River Food Pantry	350 Wisconsin
Downtown Madison, Inc.	Legacy Solar Coop	Root 2 Rise	Wisconsin EcoLatinos
Emmi Roth	Linda and Gene Farley Center for	Rooted	Wisconsin Green Muslims
Envest Microfinance	Peace, Justice & Sustainability	Savanna Institute	Wisconsin LGBT Chamber of Commerce
EZ Office Products	Little Luxuries	SCS Engineers	Wisconsin Sustainable Business Council
FaireShare CSA Coalition	Madison Children's Museum	Sergenian's Floor Coverings, Inc	YWCA - Madison
Flad Architects	Madison College	Sketchworks Architecture	ZenBusiness



Thank you to our program partners & supporting members

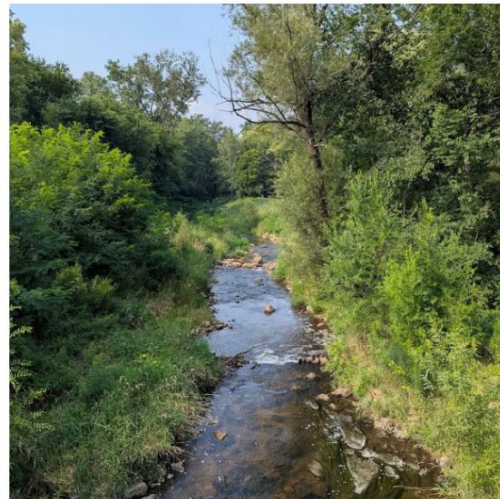




Walking All Around Dane County

Tuesday, October 13 | 5:00 PM – 6:30 PM
Parisi Park Shelter
2405 Park St, Middleton, WI 53562

[Register Now](#)



MIDDLETON | WI





Recycle Better Reunion

Wednesday, October 14, 5–6:30 PM
StartingBlock- 821 E Washington Ave.





Join us: November 6
sustaindane.org/summit

Our Local Energy Grid: Safe, Reliable, Affordable & Sustainable

Sustain Dane / Sustainable Breakfast Series | September 29, 2026

MGE Speakers:

- **Dave Benforado**
Senior Manager Community Services
- **Brenda Sargent**
Director – Sustainability and Environmental Affairs
- **Nick Schroeder**
Director – Energy Planning and Market Operations

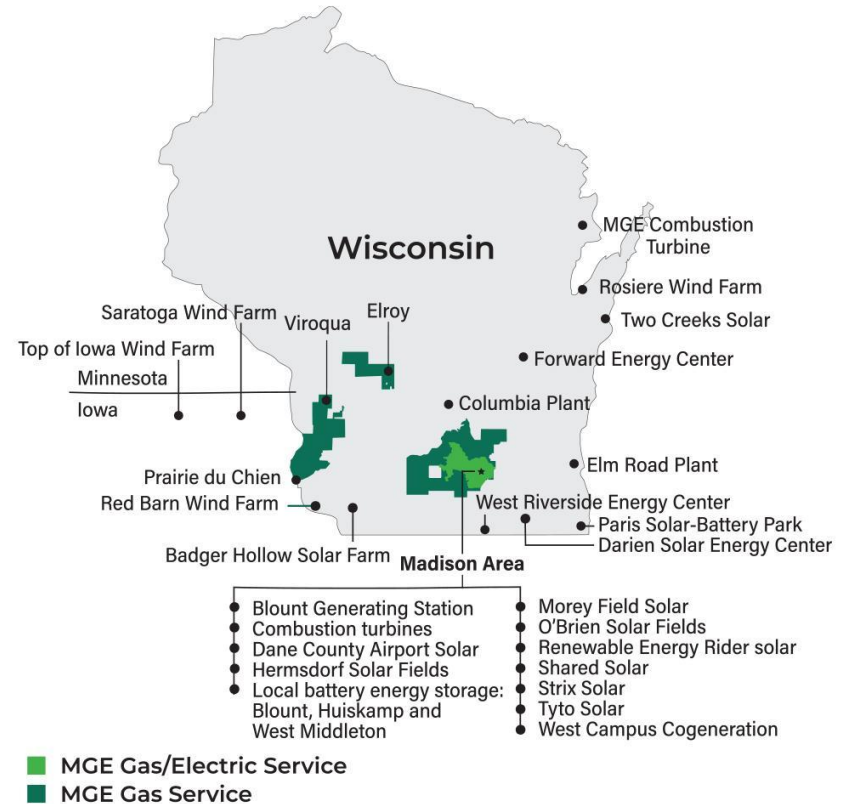
Net-Zero carbon electricity by 2050



About MGE

Madison Gas and Electric (MGE) generates and distributes electricity to 170,000 customers in Dane County and purchases and distributes natural gas to 180,000 customers in seven south-central and western Wisconsin counties.

MGE's roots in the Madison area date back more than 150 years.



Net-Zero carbon electricity by 2050



Safe, reliable energy

MGE is a national leader in electric reliability.

- Ranked in the **top four** utilities in the country for fewest number of outages per customer for more than 15 years

Gas emergency response ranks in top 10%.

MGE is committed to safe, reliable, affordable and sustainable energy.

Net-Zero carbon electricity by 2050



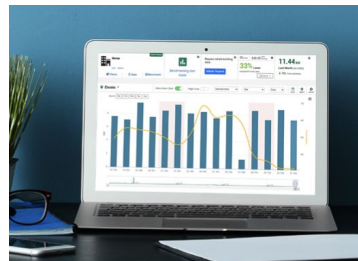
MGE Customer Sustainability Programs



Shared Solar Strix
(residential and business)



Green Power Tomorrow
(residential and business)



MGE MyMeter
(business)



**MGE Connect (Smart
Thermostats and
low-income partnership
with Focus on Energy)**
(residential)

- Renewable Natural Gas Injection (business)
- GPT RNG (residential and business)
- EV Programs (residential and business)

Net-Zero carbon electricity by 2050

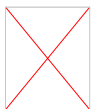
MGE's Sustainability Commitments



Net-Zero carbon electricity by 2050.



Net-Zero methane emissions from our natural gas distribution system by 2035.



100% all-electric or plug-in hybrid light-duty MGE fleet vehicles by 2030.



Continued investments in carbon-free energy projects.

With our current plans, by 2030, MGE will have added more than 40 renewable generation and battery storage projects since 2015, totaling more than 750 MW.

By 2050, on behalf of all customers, MGE expects to deliver net-zero carbon electricity.

Net-Zero carbon electricity by 2050

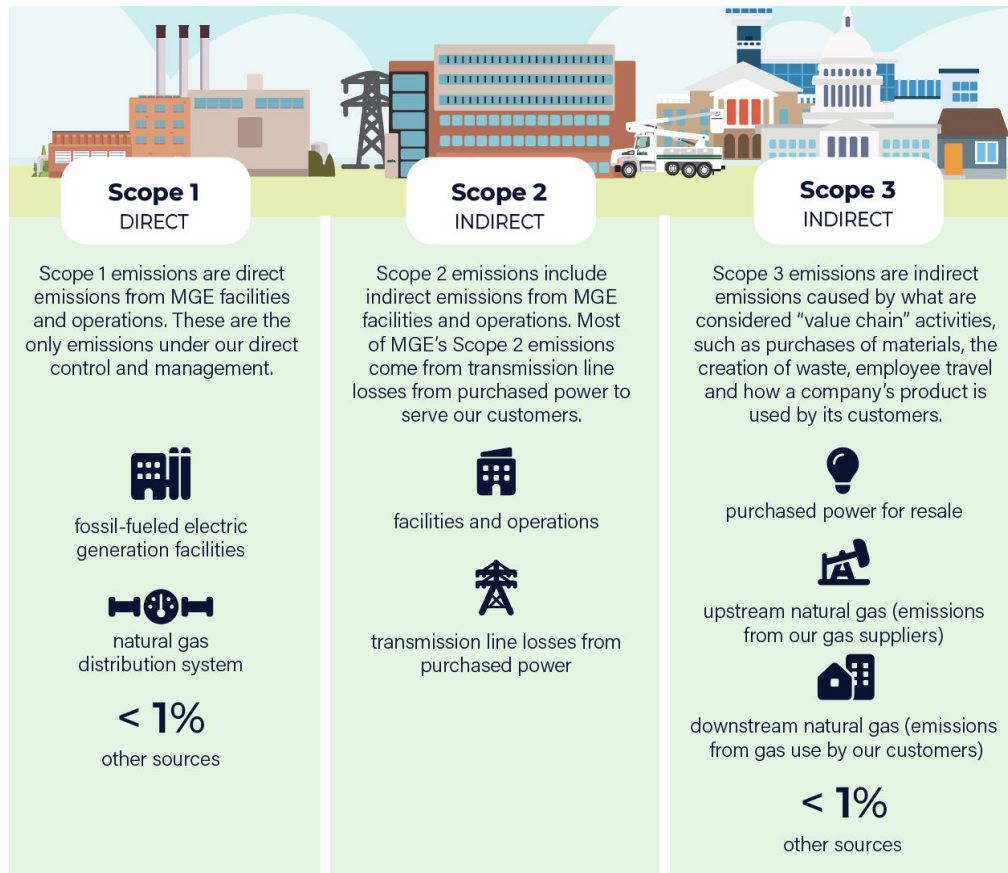


Significance of GHG Emissions and Definitions

Our Scope 1 electric generation emissions are our customers' Scope 2 electricity emissions.

MGE's progress translates to customers.

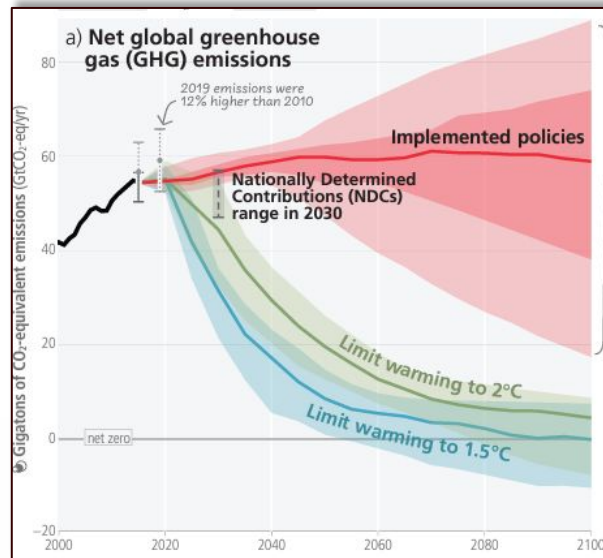
Net-Zero carbon electricity by 2050



Climate Science and GHG Emissions

It's all about GHG reductions

- IPCC climate science is continually updated.
- Steep CO₂e reductions are needed to avoid the worst impacts of climate change.
- World economy target is net-zero carbon by mid-century.



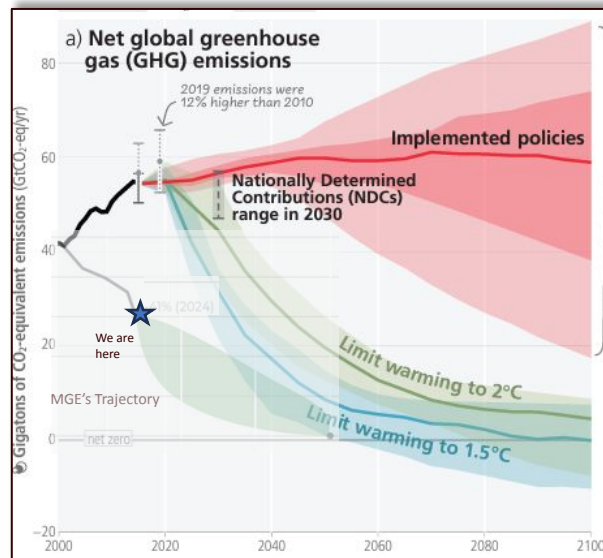
IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change

Net-Zero carbon electricity by 2050

Working Toward Net-Zero Carbon Electricity

Progress

- 2005 Baseline
- 2015 Goal met – 20% reduction
- As of 2025 – Achieved about 37% reduction
- Continuing plans to add renewable generation and battery storage



IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change

Net-Zero carbon electricity by 2050

Net-zero Carbon Electricity

- MGE was one of the first utilities to commit to net-zero carbon electricity by mid-century
- Partnership with UW-Madison Nelson Institute for Environmental Studies
 - Conducted analysis of net-zero carbon electricity goal

Net-Zero
CARBON ELECTRICITY BY 2050

**Interpreting Global Energy Scenarios for
Emissions Planning at the Utility Scale**

Report Prepared for Madison Gas and Electric Company

Research and written by
Tracy Holloway, Ph.D.
Clara Jackson

November 2020

*Nelson Institute for Environmental Studies &
Department of Atmospheric and Oceanic Sciences
University of Wisconsin – Madison
Madison, WI 53726, tholloway@wisc.edu*



**Center for Sustainability
and the Global Environment**
NELSON INSTITUTE
UNIVERSITY OF WISCONSIN-MADISON

Net-Zero carbon electricity by 2050



Transitioning MGE's Fleet to Electric



100% all-electric or plug-in hybrid
light-duty MGE fleet vehicles by 2030

Progress

- As of year-end 2025:
 - 65% of LDV count are currently EVs
 - Charged on 100% renewable energy



Net-Zero carbon electricity by 2050



Working Toward Net-Zero Methane

CH₄ Net-Zero methane emissions from our natural gas distribution system by 2035

Progress

- Continued high integrity piping and inspection program
- Getting better estimates of our emissions
- Pilot projects with technologies such as cross-compression gas control and advanced leak detection
- Renewable natural gas procurement



Net-Zero carbon electricity by 2050

What it means for customers

- Check out MGE's ESG Data Center for the latest information and progress towards our goals
- MGE discloses sustainability metrics through several voluntary ESG Frameworks

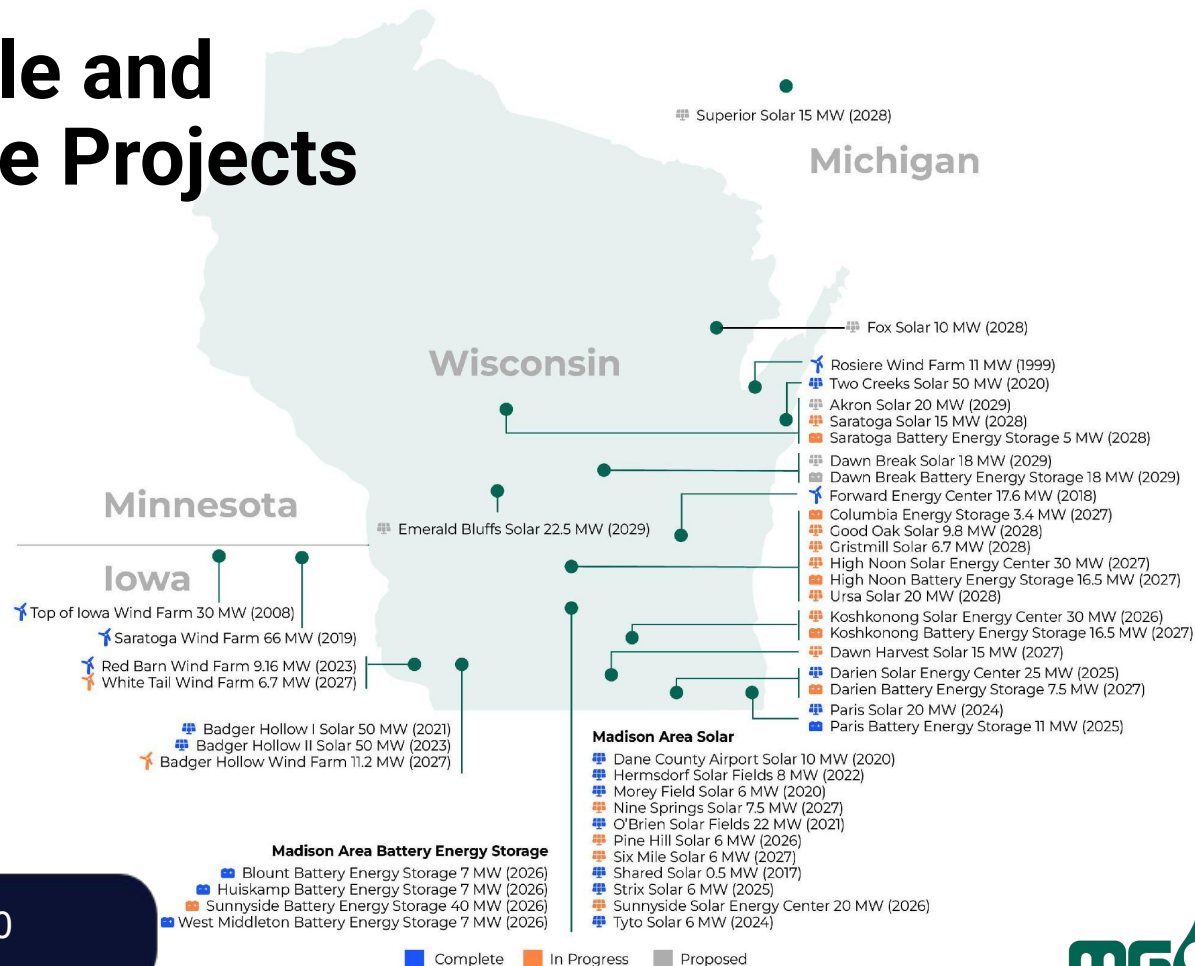
2025 Carbon and Renewable Energy Snapshot

Overall CO₂ emission rate	1.34 lb/kWh
Percent reduction from 2005	37%
Residual CO₂ emission rate	1.41 lb/kWh
Overall renewable percentage	27%
Residual renewable percentage	24%



Net-Zero carbon electricity by 2050

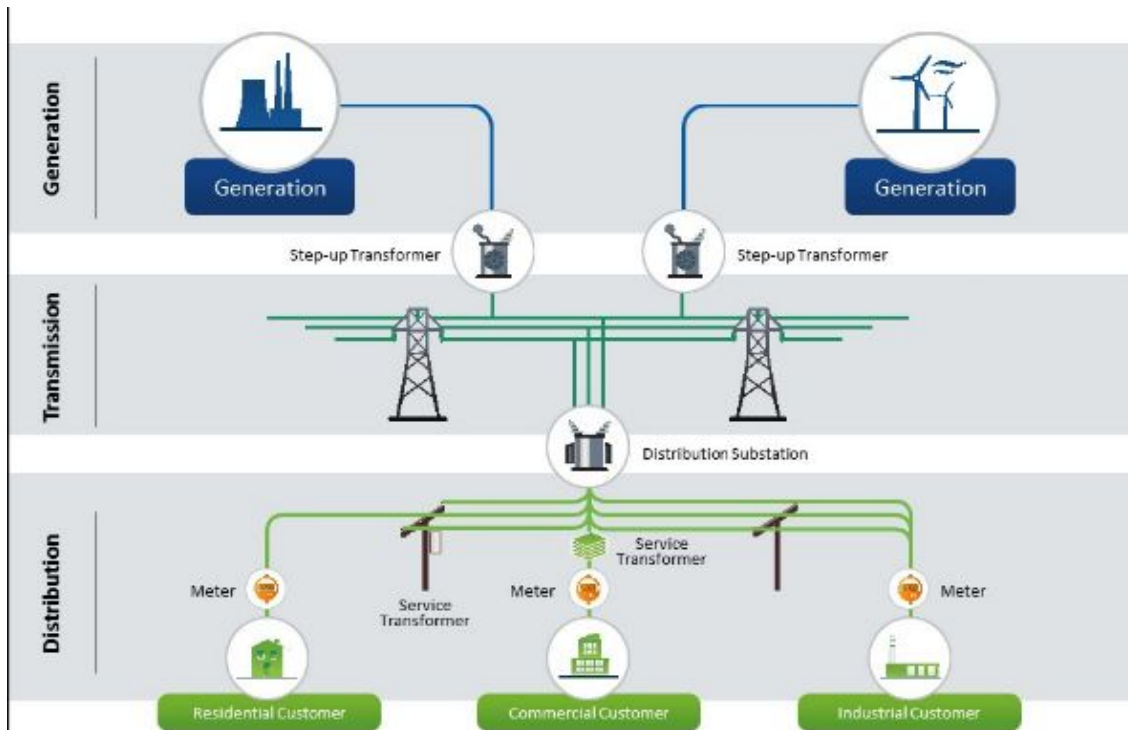
MGE Renewable and Battery Storage Projects



Net-Zero carbon electricity by 2050



Electric System Overview



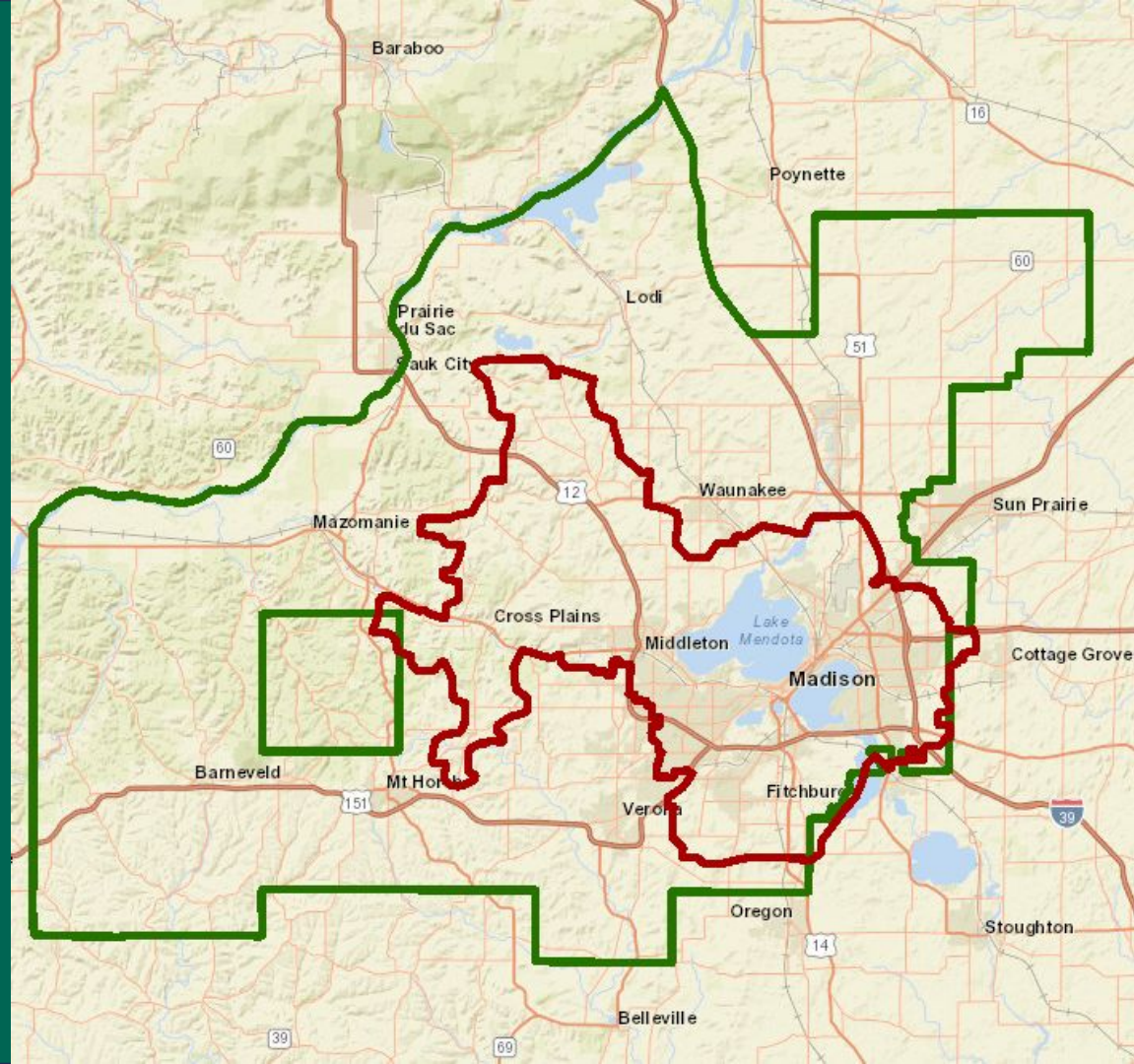
Net-Zero carbon electricity by 2050



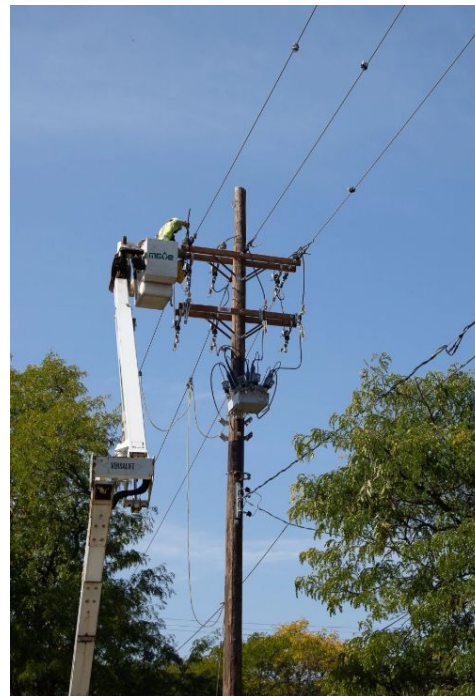
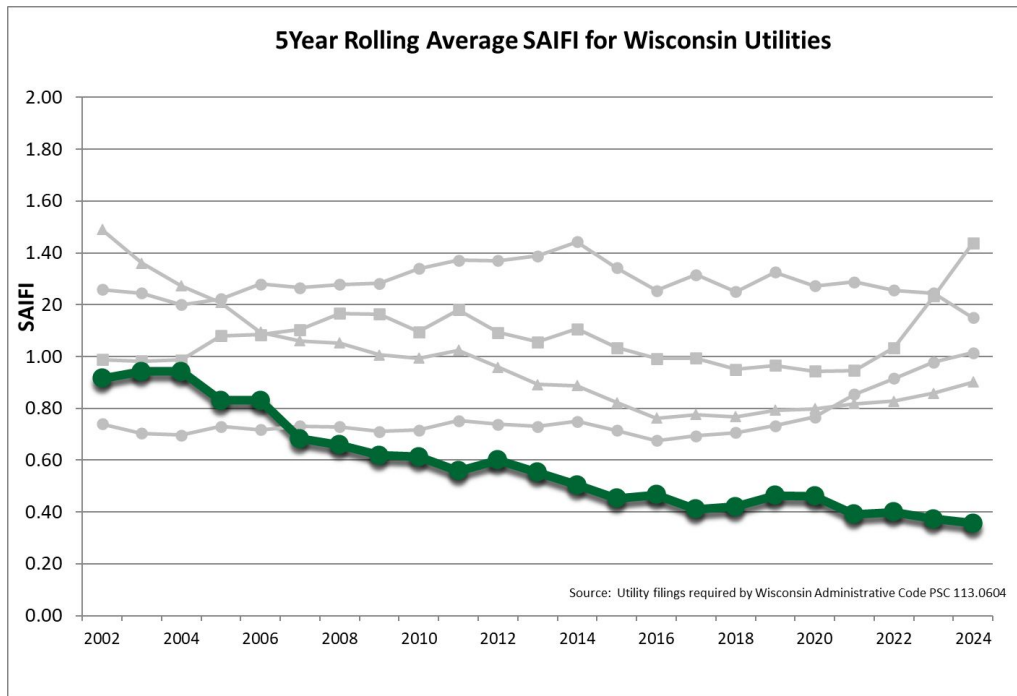
MGE Distribution Franchise Area

- 170,000 Electric Customers, all in Dane County
- 180,000 Gas Customers in seven counties (Columbia, Crawford, Dane, Iowa, Juneau, Monroe, and Vernon – not all shown here)
- Highly residential customer base
- Highly undergrounded system
- Highly reliable

Net-Zero carbon electricity by 2050



MGE is a consistent reliability leader in Wisconsin



Net-Zero carbon electricity by 2050



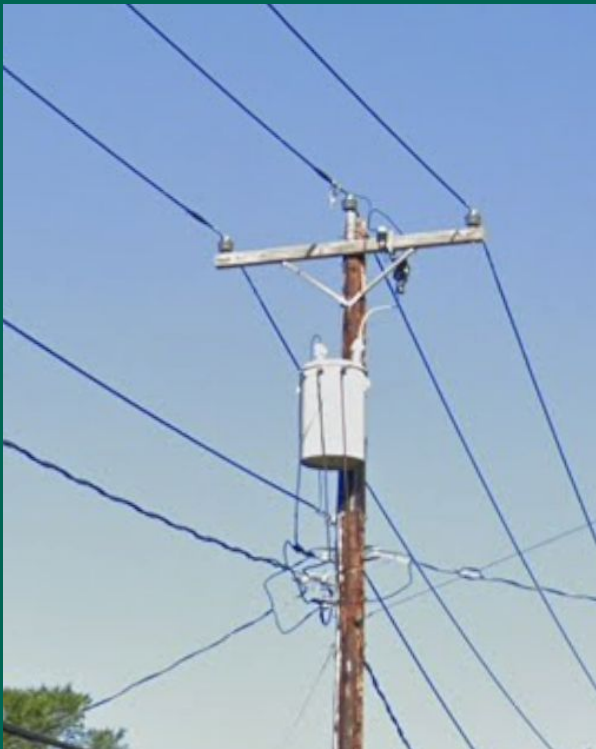
Distribution Elements

3Ph Primary
Voltage
~8,000V

Primary
Neutral

Secondary
Voltage
120/240V

House
Service



Net-Zero carbon electricity by 2050

Distribution Substations

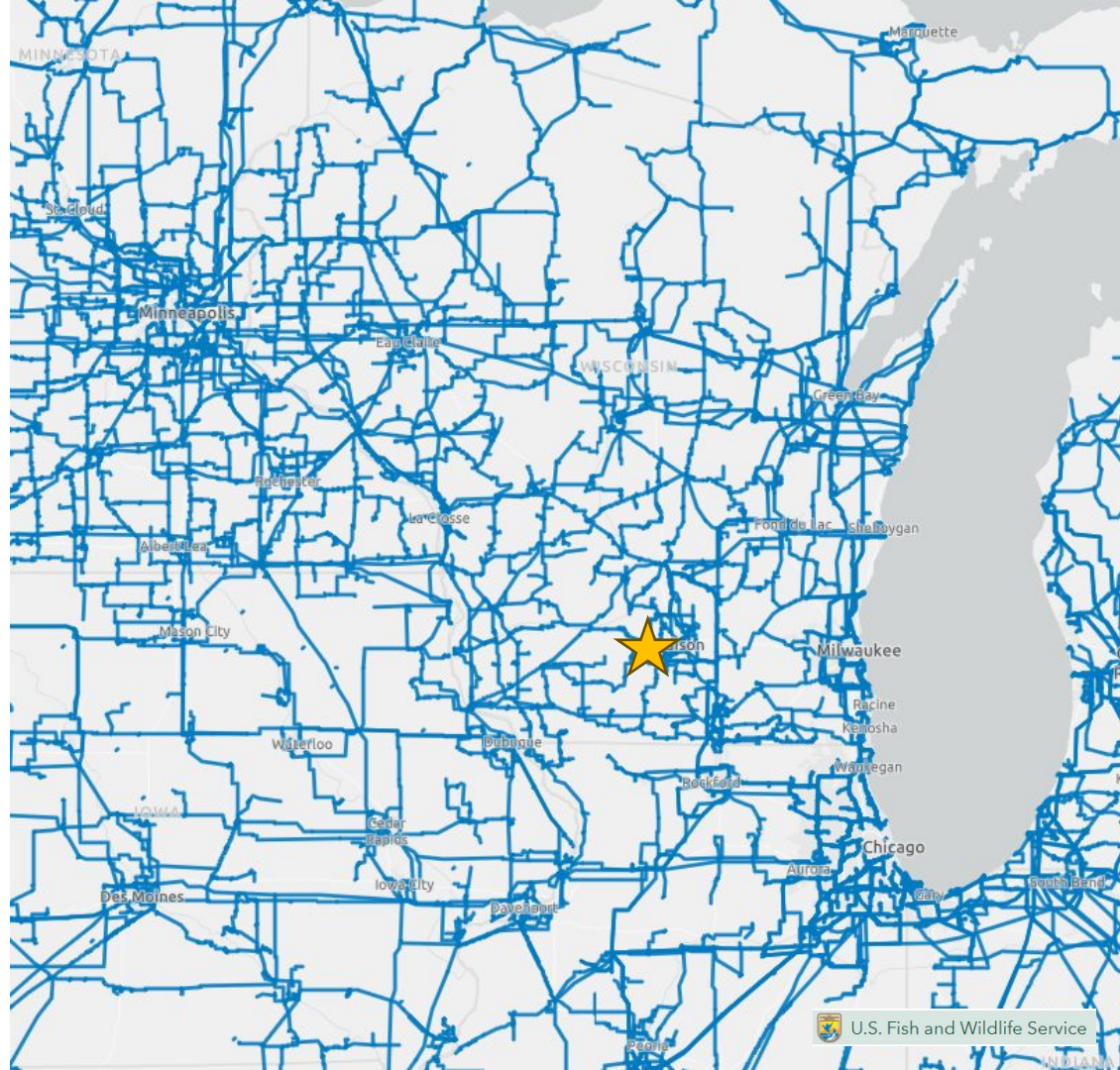
- Take high voltage power from the transmission system (138 or 69kV in Dane County)
- Transforms it down to a primary distribution voltage (4.1 to 13.8kV for MGE)
- Circuit Breakers feed distribution feeders which exit the substation and travel 1-10 miles to reach local transformers



Net-Zero carbon electricity by 2050



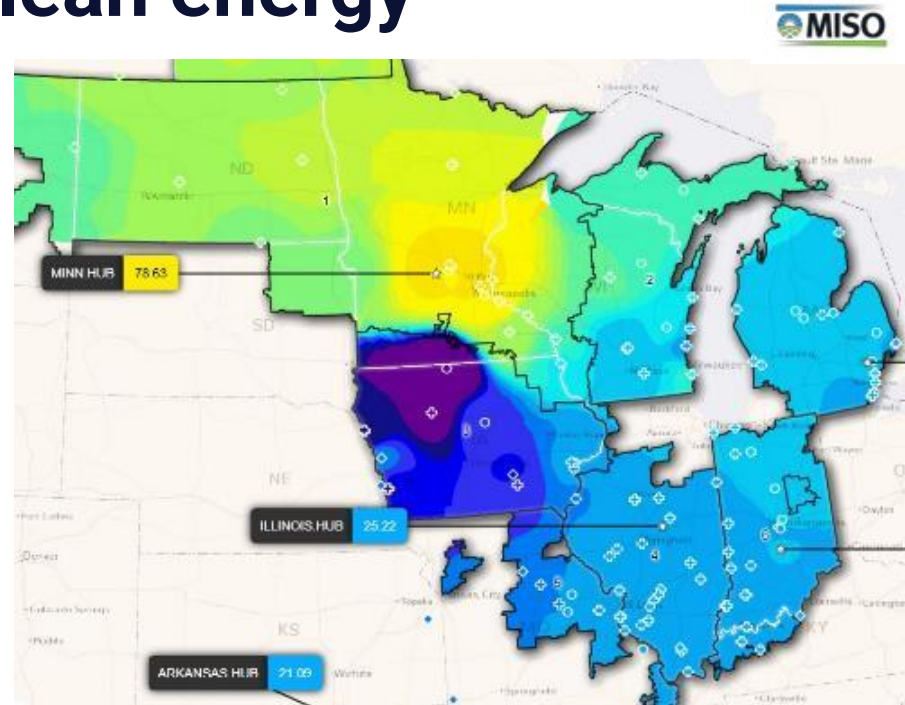
- Voltages of 69 to 345kV in the Wisconsin
- Lines run 10s to 100s of miles to tie generation and load together
- Mostly a looped system, making transmission outages rare



Net-Zero carbon electricity by 2050

Regional transmission challenges inhibit the economic dispatch of clean energy

- **Transmission investment has lagged generation build-out**
 - State-by-state approval process
 - Coordination across ISOs, RTOs, and utilities
 - Results in bottlenecks for delivery of renewable generation



Net-Zero carbon electricity by 2050

Generation



Legacy Technologies

Coal



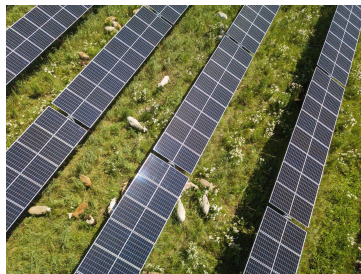
Nuclear



Wind



Solar



Current Toolkit

Natural Gas



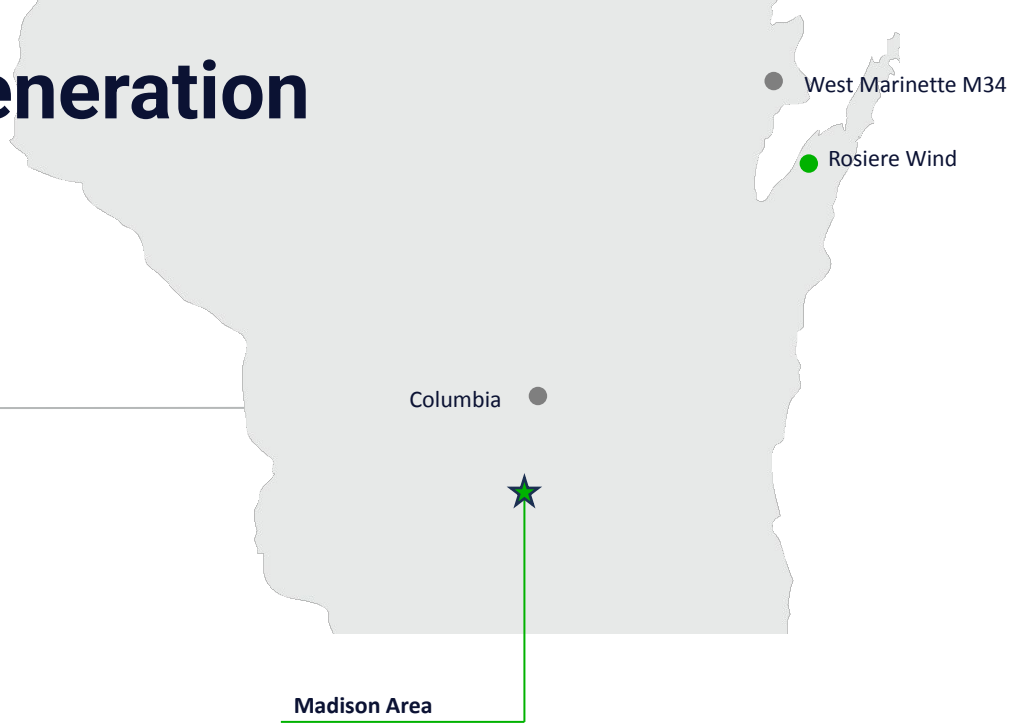
Battery Storage



Net-Zero carbon electricity by 2050



MGE Generation 2005



Blount
NSP, FCH, SYC, CTs
DGs
West Campus CoGen
Interruptible Customers

Renewable MGE
Generation
Installed Capacity
Wind - 11 MW

Net-Zero carbon electricity by 2050



MGE Generation

2015

Renewable MGE
Generation
Installed Capacity

Wind - 139 MW

Endeavor Wind PPA (2008)

Top of Iowa Wind (2008)

Columbia

West Marinette M34

Rosiere Wind

Forward Wind PPA (2008)

Elm Road (2010-1)

Madison Area

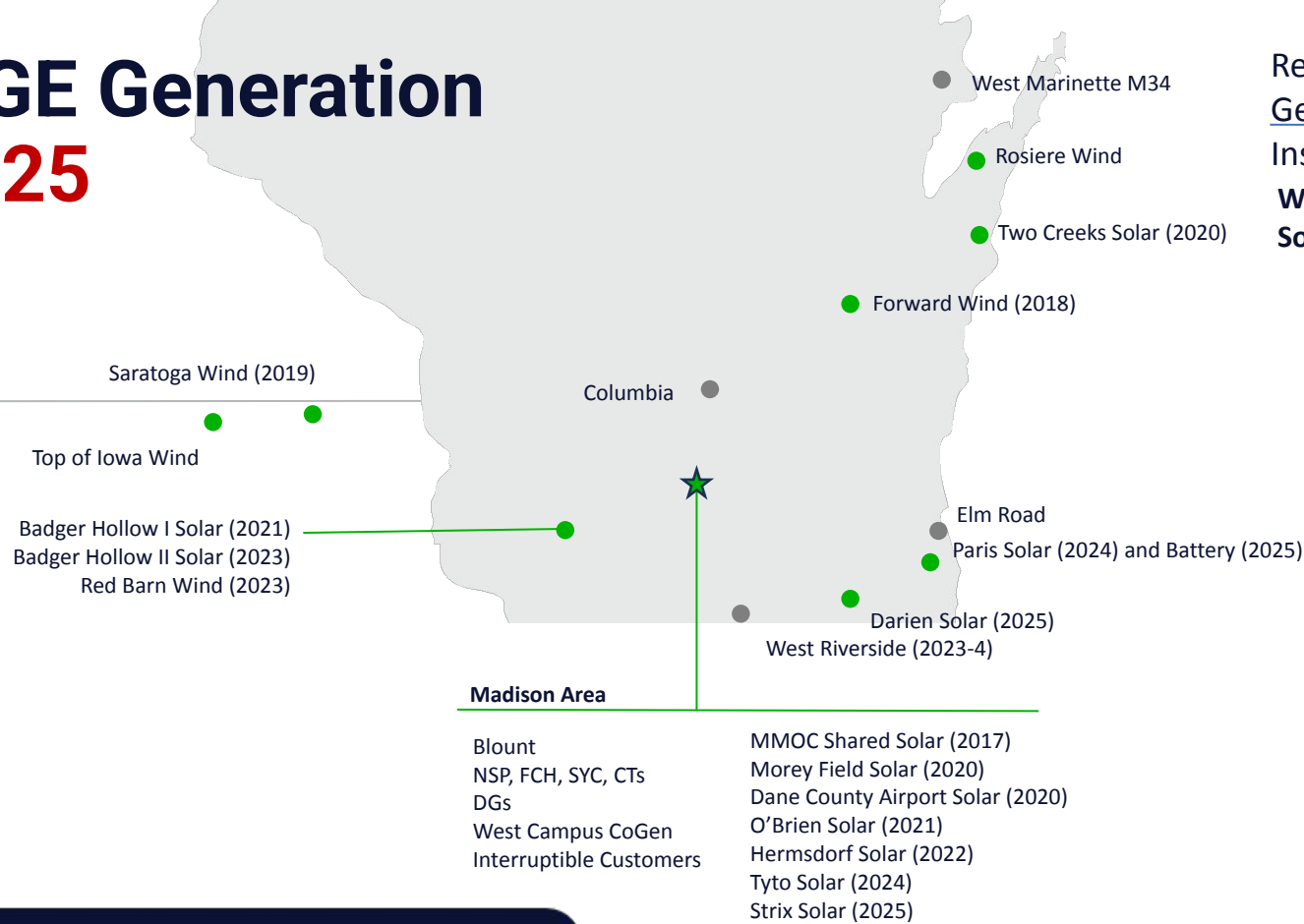
Blount
NSP, FCH, SYC, CTs
DGs
West Campus CoGen
Interruptible Customers

Net-Zero carbon electricity by 2050



MGE Generation 2025

Renewable MGE
Generation
Installed Capacity
Wind - 164 MW
Solar - 252 MW



Net-Zero carbon electricity by 2050

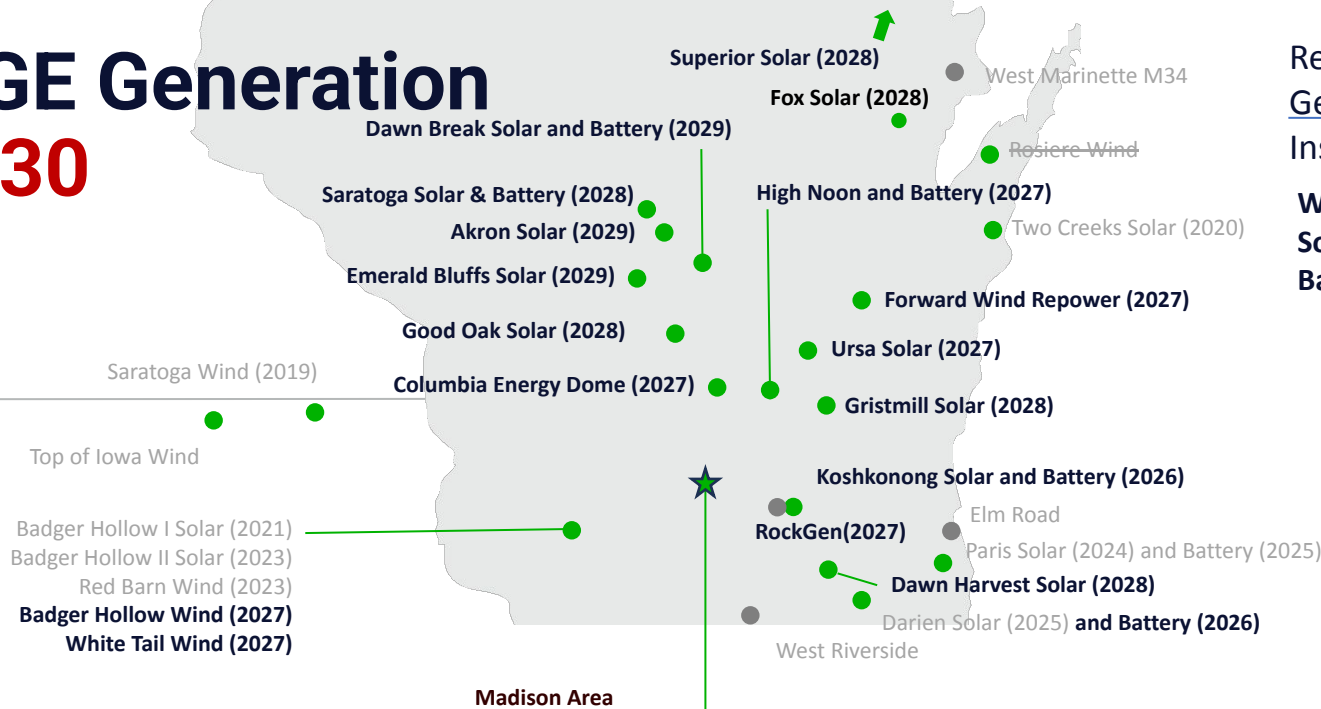


MGE Generation

2030

Renewable MGE
Generation
Installed Capacity

Wind - 140 MW
Solar - 499 MW
Batteries - 139 MW



Madison Area

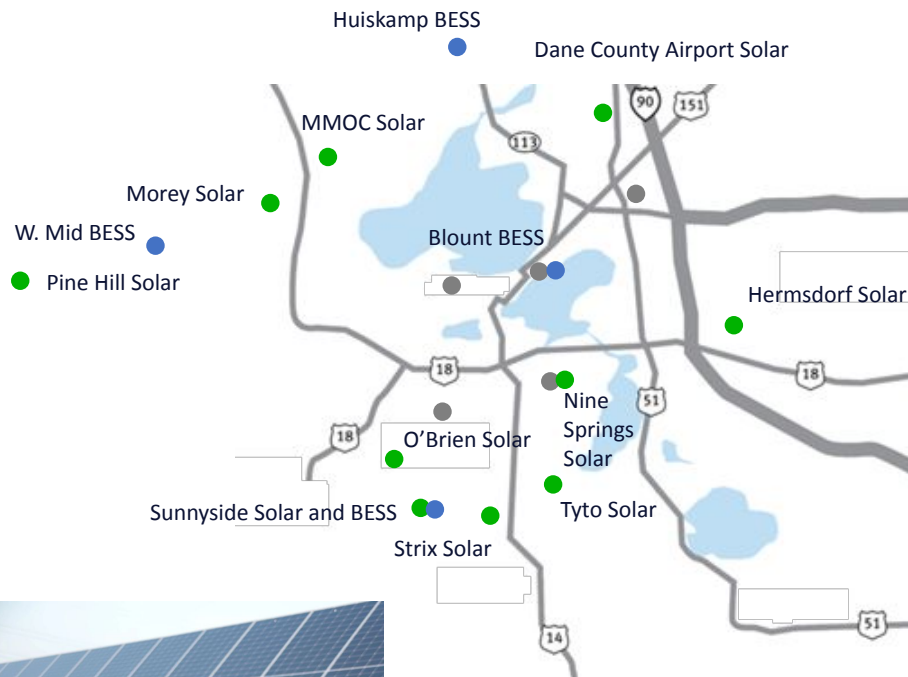
Blount
NSP, FCH, SYC, CTs
DGs
West Campus CoGen
Interruptible Customers

MMOC Shared Solar (2017)
Morey Field Solar (2020)
Dane County Airport Solar (2020)
O'Brien Solar (2021)
Hermsdorf Solar (2022)
Tyto Solar (2024)
Strix Solar (2025)
Local Batteries 21 MW (2026)
Pine Hill Solar 6 MW (2026)
Sunnyside Solar 20 MW and Batteries 40 MW (2026)
Nine Springs Solar 8 MW (2027)

Net-Zero carbon electricity by 2050



Local Projects



Net-Zero carbon electricity by 2050

Who Oversees the Electric Grid?



Public Service Commission of Wisconsin (PSCW)

- Approves retail electric rates
- Reviews major utility investments
- Protects customer interests

Federal Energy Regulatory Commission (FERC)

- Oversees wholesale electricity markets
- Regulates interstate transmission

North American Electric Reliability Corporation (NERC)

- Establishes reliability standards
- Helps ensure a secure electric grid

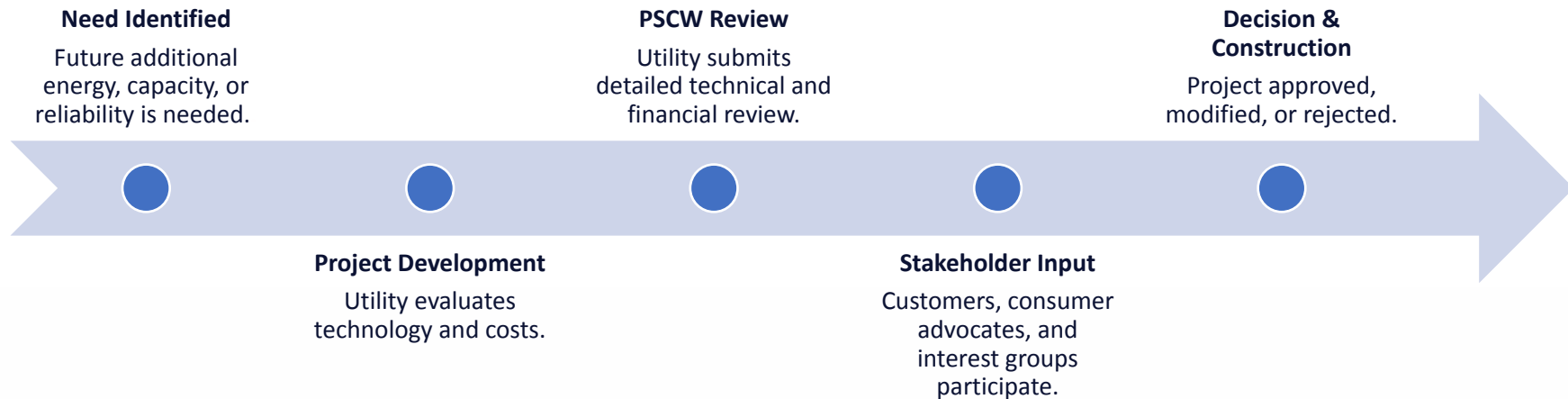
Midcontinent Independent System Operator (MISO)

- Operates wholesale markets
- Performs real time balancing and dispatch

Net-Zero carbon electricity by 2050

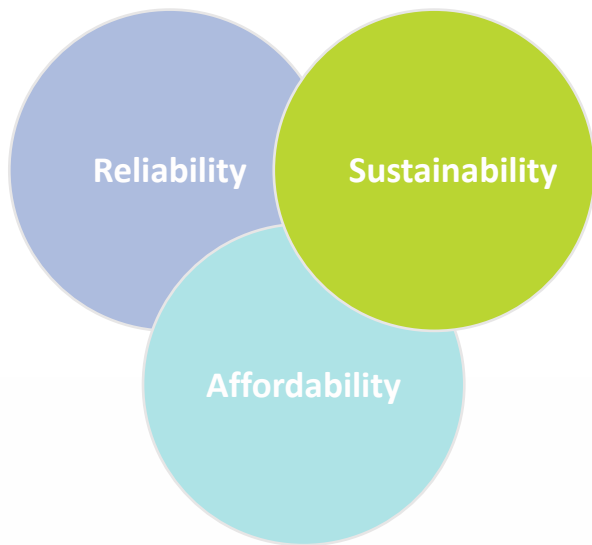


How New Energy Projects Are Approved



Net-Zero carbon electricity by 2050

How Energy Projects are Evaluated



- **Recent Landscape Changes**
 - Changes in Federal Tax Incentives (OBBBA)
 - Recension of the EPA Greenhouse Gas Rules
 - Construction Cost Increases

Net-Zero carbon electricity by 2050

Who Keeps the Grid Reliable?

NERC

Sets reliability rules for the bulk electric system

MRO

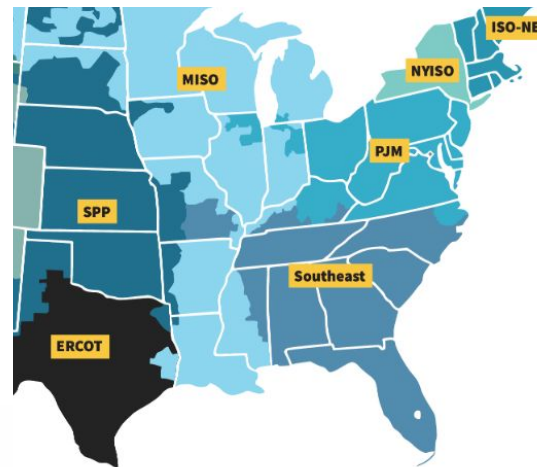
Audits utilities for compliance with NERC standards

MISO

Coordinates power flows and operations regional energy markets

MGE

Plans and operates the local system to meet customer needs



Net-Zero carbon electricity by 2050

How MISO Electricity Markets Work



Ancillary Services (Stability)

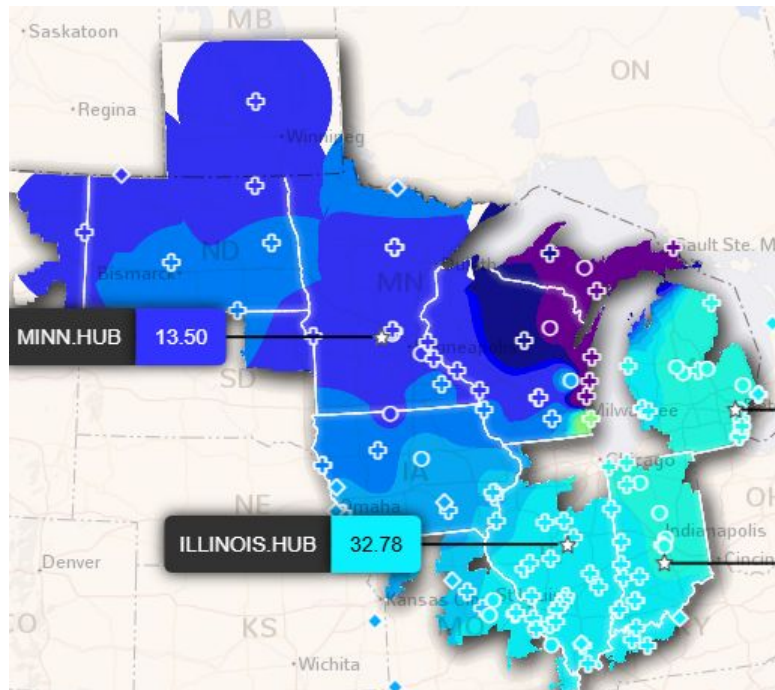
Maintain system stability and operating reserves.

Capacity Market (Future Supply)

Ensures adequate generation is available in future years.

Energy Market (Daily Electricity)

Balances electricity supply and demand every day.



Net-Zero carbon electricity by 2050

Planning for Future Reliability

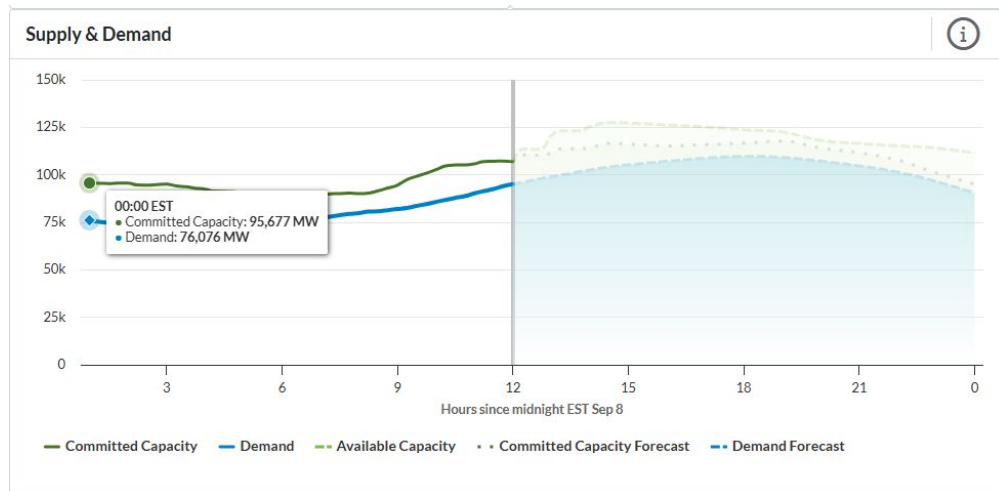


MISO and PSCW Both Require Reserve Capacity

- Utilities must plan for enough resources to meet future demand.

Planning Is Becoming More Complex

- Increasing reliance on weather-dependent resources means planners must evaluate:
 - Summer risk
 - Winter risk
 - Daytime risk
 - Evening risk



New Focus

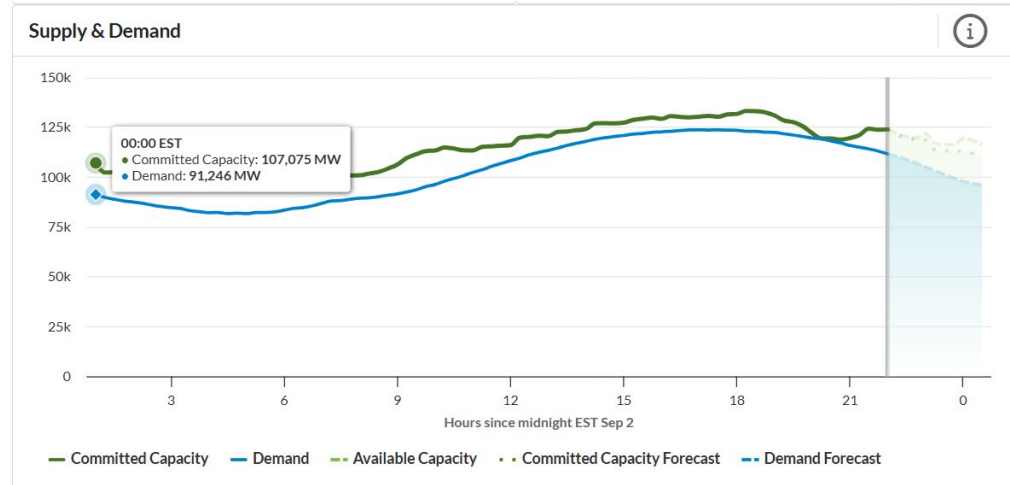
- Not just the hottest hour of summer, but the hours when shortages are most likely.

Sep 2nd, 2026 MISO Emergency Event



- **Real-Time Market Capacity Squeeze**

- Hot, humid weather, low wind
- Declining evening solar output
- Precipitous drop in import capability from neighboring regions
- Real-Time Energy Prices Hit Cap of \$10,000 / MWh



- **Similar events Happening in Winter**

- Triggered by cold temperatures and low renewable output times
- Contention on the natural gas pipelines

Net-Zero carbon electricity by 2050



Random Day Fuel Mix Aug 25, 2026



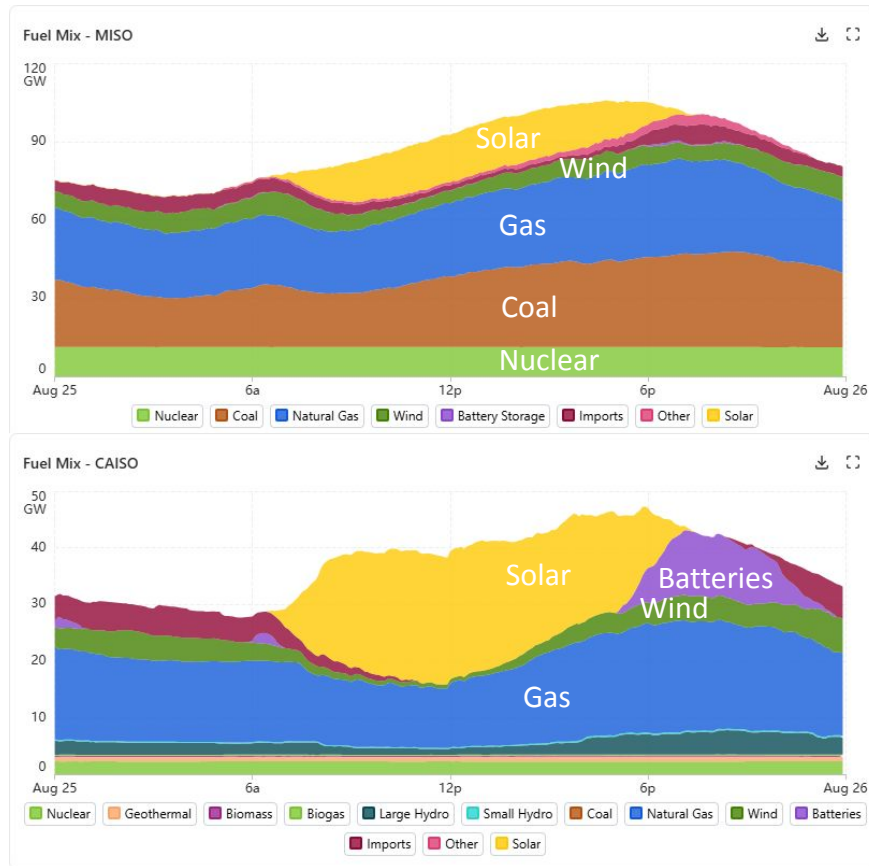
MISO

VS.



CAISO

Source:  GridStatus.io



Net-Zero carbon electricity by 2050

Battery Energy Storage System (BESS)

- 4-hour lithium-ion battery
- Can provide energy storage and ancillary services (voltage and frequency regulation)
- Modular, shipping container-sized
- 93.7% efficiency when new
- MGE projects all using newer lithium iron phosphate (LFP) chemistry

Net-Zero carbon electricity by 2050



MGE BESS Projects

Project	Location	MGE Size (MW)	In Service
Paris	Kenosha Co.	11	2025
Local Subs	Madison Area	21	2026
Sunnyside	Fitchburg	40	2026
Koshkonong	Dane Co.	16.5	2027
Darien	Walworth Co.	7.5	2027
High Noon	Columbia Co.	16.5	2027
Saratoga	Wood Co.	5	2028
Dawn Break	Waushara Co.	18	2029
Total		136 MW	

Net-Zero carbon electricity by 2050



Upcoming Storage Technologies

- **Now – Columbia Energy Dome – ISD 2027**
 - Compressed CO₂ – 20 MW – 10 hours, 75% efficient
- **Future – Battery Alternate Chemistries**
 - Increased discharge duration
 - Less exotic materials
 - Sodium Ion – 2 to 8 hours, 85%, heavier
 - Iron – air 100 hours, 50% efficiency



Net-Zero carbon electricity by 2050

Realta Fusion – MGE Energy Partnership

Local Realta Fusion startup
to stay in Madison

Forge Fusion facility to be
located in the former
Oscar Mayer plant

Goal: 200 MWe fusion plant
in the 2030s

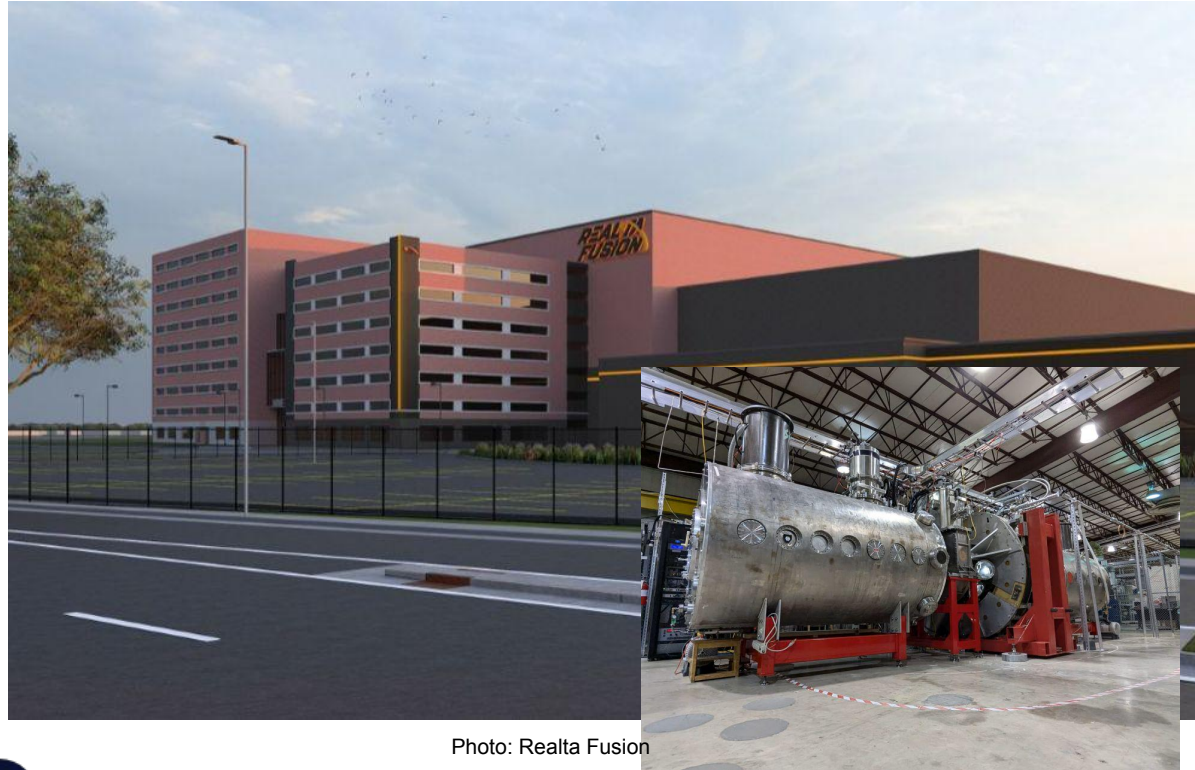


Photo: Realta Fusion

Net-Zero carbon electricity by 2050

The Power of Working Together

Let's work together for a more sustainable future.



Net-Zero carbon electricity by 2050



Thank you

mge2050.com | mge.com

Net-Zero carbon electricity by 2050





Sustainable Breakfast Series

Tues, Sept 29 at 8:30AM

**Our Local Energy Grid:
Safe, Reliable, Affordable
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