



# Wisconsin Public Utility Institute

March 1, 2018

Highlights on the Public Service Commission of  
Wisconsin's Work on Grid Modernization

Public Service Commission of Wisconsin

Ellen Nowak, Chairperson

# Agenda

- Public Service Commission of Wisconsin and grid modernization
  - What is grid modernization?
  - How does the PSCW view grid modernization?
  - PSCW grid modernization related dockets
- PSCW Grid Modernization Survey
  - Who responded
  - Topics included in PSCW grid modernization survey
  - Top five topics as prioritized by utilities and stakeholders
  - Overall results for all respondents
- Commission Staff's Survey Follow Up Meetings
  - More in depth discussion with stakeholders
  - Commission Staff Training
- Next Steps

# What is Grid Modernization? It depends who you ask...

**EI:** “Broadly speaking, this is what grid modernization is all about: replacing distribution lines and deploying new technologies (e.g., distribution management systems, high speed communications, advanced sensors, energy storage) to provide new capabilities to enable a clean energy future.” ([Link to Quote](#))

**DOE:** “We are working with public and private partners to develop the concepts, tools, and technologies needed to measure, analyze, predict, protect, and control the grid of the future. Our portfolio of work will help integrate all sources of electricity better, improve the security of our nation's grid, solve challenges of energy storage and distributed generation, and provide a critical platform for U.S. competitiveness and innovation in a global energy economy. The grid of the future will deliver resilient, reliable, flexible, secure, sustainable, and affordable electricity.” ([Link to Quote](#))

- While grid modernization is a broad construct with various jurisdictions utilizing the term in a multiplicity of ways, the core tenets of grid modernization are the intersection of new technology with the existing electric distribution grid.

# Grid modernization in Wisconsin

- Utilities and stakeholders should drive change and regulators should focus on outcomes
- PSCW is open to innovative proposals from utilities and stakeholders
- Regulator's role is to calibrate and stay informed
- Regulatory model has not changed nearly as fast as technology—this is a good thing
- Commission represents everyone's interest and need to foster respectful and meaningful dialogue

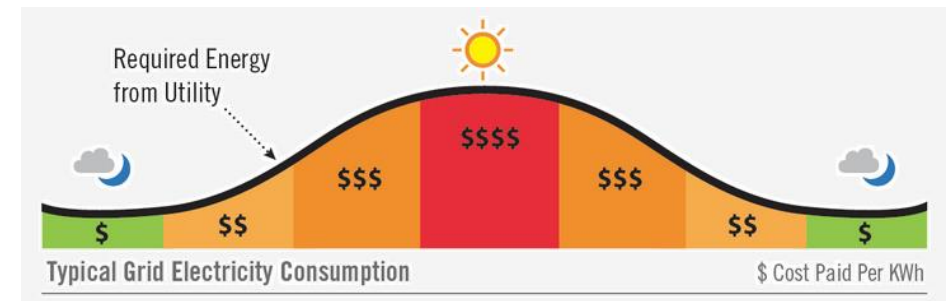
# PSCW dockets involving grid modernization topics

- Electric Vehicle Pilots
  - MGE – Charge@Home Pilot Project - Tariff authorized 3270-UR-121 (2016)
- Community Solar
  - MGE – 3270-TE-101 (2016)
  - NSPW – 4220-TE-101 (2015)
  - New Richmond – 4139-TE-102 (2015)
  - River Falls - 5110-TE-102 (2015)
- Market Based Rate Designs
  - WEPCO - 5-UR-108 RTMP Tariff (2017)
  - WPSC - 6690-UR-125 NLMP Tariff (2017)
  - MGE - 3270-UR-121 Sp-3 Tariff (2016)
- Distributed Energy Resources Special Tariffs
  - We Energies - Tariff Restructuring - 5-UR-107 (2015)
  - WPSC - Net Metering - 6690-UR-122 (2015)
  - MGE – Renewable Energy Rider – 3270-TE-102 (2017)



# PSCW dockets involving grid modernization topics (cont.)

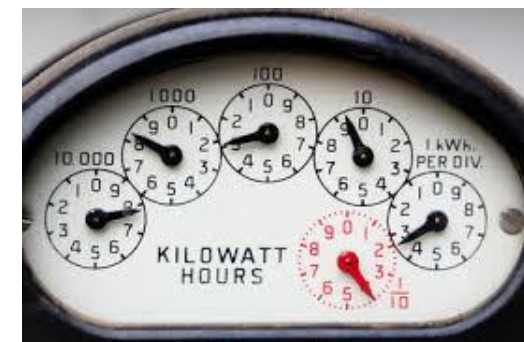
- Customer Information System Investments
  - WPSC – ICE Customer Software Project - 6690-UR-123 (2015)
  - MGE – Customer Information System Upgrade – 3270-UR-121 (2016)
- Customer Centric Rate Designs
  - WPL – Fixed Bill – 6680-UR-120 (2016)
  - WPL – Optional Demand Rate for Residential Customers – 6680-UR-120 (2016)
  - WPSC – Residential TOU Rate – 6690-UR-123(2014) & 6690-UR-124(2015)
  - MGE - Residential TOU Rates - 3270-UR-120 (2014)
  - MGE – Renewable Energy Rider – 3270-TE-102 (2017)
  - NSPW – Residential TOD Rates - 4420-UR-116 (2009)



# PSCW dockets involving grid modernization topics (cont.)

## Advanced Metering Infrastructure

- 5-GF-263 - AMI Survey of all 12 IOUs and 83 municipal electric utilities in Wisconsin
  - Of the 2.6 million residential electric meters in Wisconsin, 78% are AMI (can be read remotely) and about half of these employ two-way communications.
  - WEPCO will replace 500,000 aging AMR meters with AMI meters (Expected completion January 2019)
  - WPSC will replace 457,000 with AMI meters
  - WP&L will upgrade 18,000 meters to AMI in near Beaver Dam, WI (Expected completion 2021)
  - NSPW currently employs AMR enabled meters and will employ AMI in the future
  - MGE currently employs AMR and has plans for two pilot programs for AMI
  - SWLP is currently replacing the bulk of its meters to AMI
  - Pioneer P&L Co. & Westfield Milling & Electric Co. upgraded to AMI in 2011
  - Municipal Utilities:
    - 20 utilities have AMR or are planning to upgrade to AMR systems in the near future
    - 18 utilities have AMI or are planning to upgrade to AMI systems in the near future



# PSCW grid modernization survey respondents

## Utilities (and Energy Providers)

Dairyland Power Cooperative  
Madison Gas & Electric Company  
Municipal Electric Utilities of Wisconsin  
Northern States Power of Wisconsin  
We Energies  
Wisconsin Electric Cooperative Association  
Wisconsin Power & Light Company  
Wisconsin Public Service Corporation  
WPPI

## Stakeholders

Citizens Utility Board of Wisconsin  
Clean Wisconsin  
Customers First Coalition  
Initiative for Competitive Energy  
International Brotherhood of Electrical Works Local #953  
RENEW Wisconsin  
Wisconsin Industrial Energy Group  
Wisconsin Paper Council



# What was in the PSCW's Grid Modernization Survey?

Stakeholders prioritized the following ten topics to help inform Wisconsin's continued grid modernization efforts:

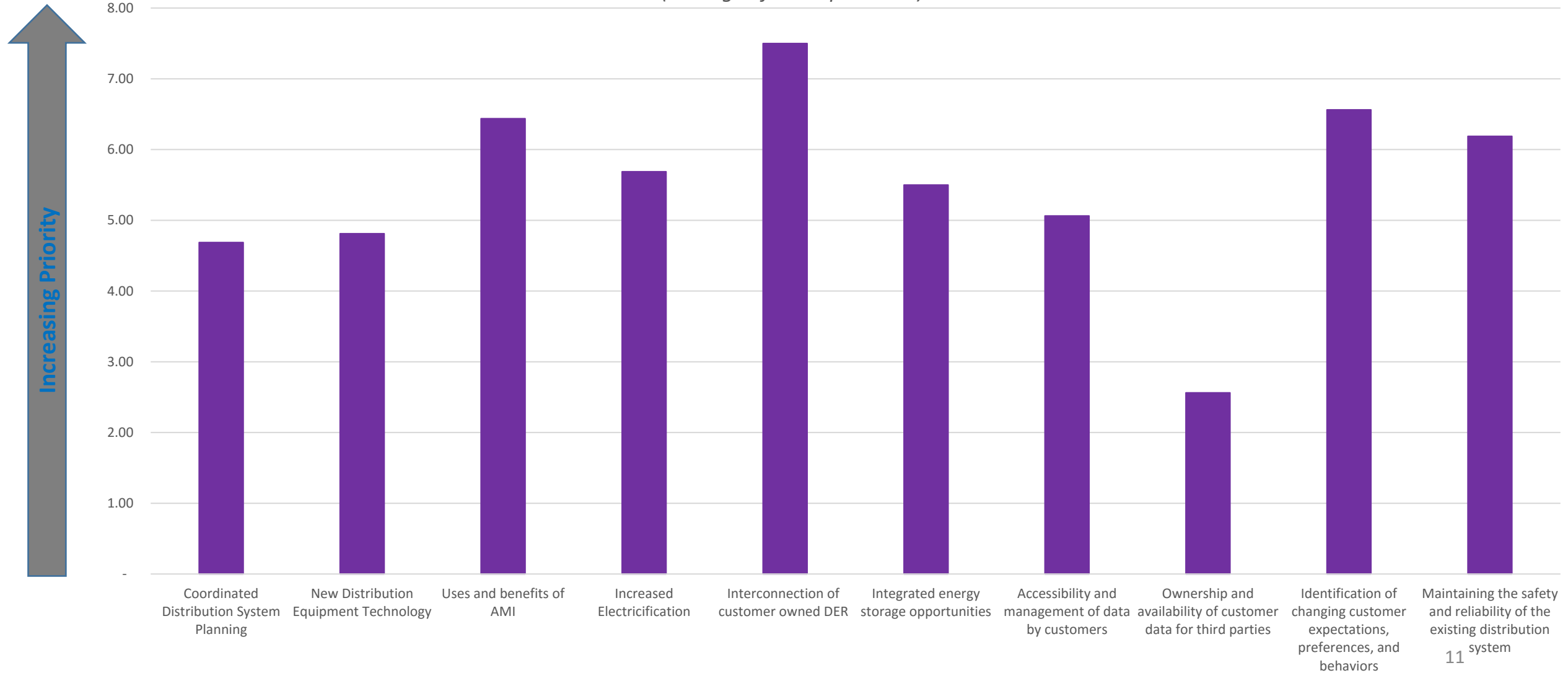
- Coordinated distribution system planning
- New distribution technology (inverters, transformers, remote sensing, predictive outage detection, etc.)
- Uses and benefits of AMI – advanced metering infrastructure
- Increased electrification (cars, pumps, etc.)
- Interconnection of customer owned-distributed energy resources (DER)
- Integrating energy storage opportunities
- Accessibility and management of data by customers
- Ownership and availability of customer data for third parties
- Identification of customers' changing expectations, preferences, and behaviors
- Maintaining the safety and reliability of the existing distribution system, including age and condition issues

## Overall Top Five Priorities

1. Interconnection of customer-owned distributed energy resources
2. Identification of customers' changing expectations, preferences, and behaviors
3. Uses and benefits of advanced metering infrastructure
4. Maintaining the safety and reliability of the existing distribution system
5. Increased electrification (cars, pumps, etc.)

# Grid Modernization Survey Results

*(Average of all respondents)*



# Utilities' Top Five Priorities

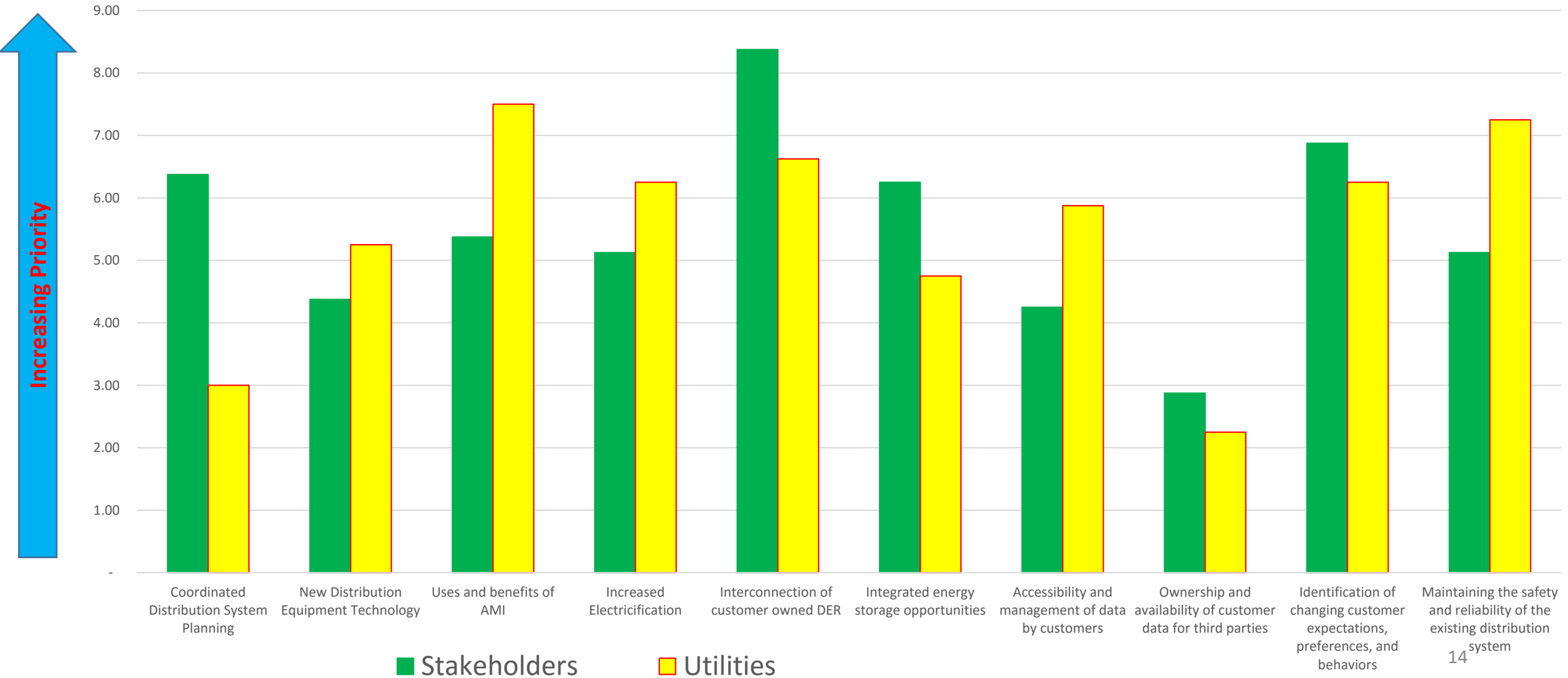
1. Uses and benefits of advanced metering infrastructure
2. Maintaining the safety and reliability of the existing distribution system
3. Interconnection of customer owned distributed energy resources
4. Identification of customers' changing expectations, preferences, and behaviors *(Tied for Fourth Priority)*
4. Increased electrification (cars, pumps, etc.) *(Tied for Fourth Priority)*

# Stakeholders' Top Five Priorities

1. Interconnection of customer owned distributed energy resources
2. Identification of customers' changing expectations, preferences, and behaviors
3. Coordinated distribution system planning
4. Integrated energy storage opportunities
5. Uses and benefits of advanced metering infrastructure

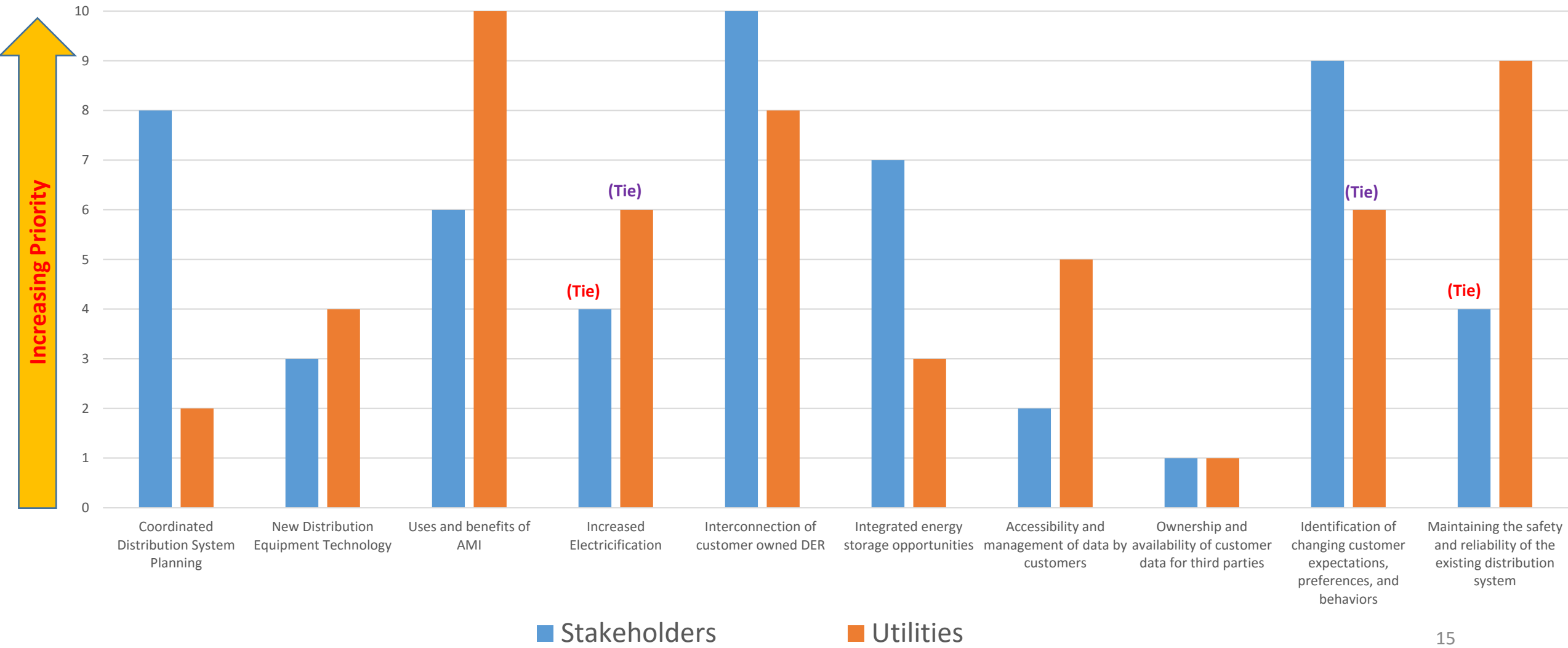
# Grid Modernization Survey Results

*(Chart below reflects the average responses by each group)*



# Grid Modernization Survey Results

(Chart below reflects the rank order by each group)



# Commission Staff Meetings

- Staff has scheduled meetings with most of the surveyed stakeholders for the first quarter of 2018.
- The agendas for these meetings are designed for the stakeholders to have a forum for communicating their unique strategies to address grid modernization.
- Preliminary Common Threads from Meetings (~90% of meetings completed):
  - Investments in enhanced information technology can improve customer experience and interaction with the utility; however, these investments can take many forms (CIS and/or AMI) and must present a robust business case.
  - Pilot projects are being considered to respond to changing customer expectations and technology, but remain limited in scope before making significant utility investments in modifying infrastructure and/or systems.
  - Increasing numbers of rate designs to provide customers pricing signals
  - Renewed emphasis on collaborative projects based on utility, stakeholder, and customer feedback are being explored.



# Commission Staff Training

- The Commission has made investments in training its Staff to help efficiently facilitate Wisconsin’s conversation on grid modernization. Additionally, Staff has worked to understand best practices and lessons learned from other jurisdictions’ grid modernization efforts.
- PSCW has recently sent staff to the following grid modernization training opportunities:
  - OMS / NARUC – Distribution Systems and Planning Training for Midwest Public Utility Commission
  - 2018 Consumer Symposium: Transforming the Customer Relationship/DistribuTech
  - Midwest Governors’ Association: Hardening the Midwestern Grid
  - National Governors’ Association: Energy Innovation Summit
  - Center for Business and Regulation (University of Illinois): Frameworks for Regulation of Public Utilities in the 21<sup>st</sup> Century

## Next Steps

- Facilitate continued discussion and collaboration between all interested parties outside of a contested rate case setting.
- Utilities, customers, and stakeholders will drive policy setting process going forward on a case by case basis.
- The PSCW will facilitate information exchanges with grid modernization experts from different states to learn lessons from other jurisdictions.
- Whitepaper to address the common threads from stakeholder meetings and provide an inventory of the critical issues with plans of the stakeholders to address these issues.

# Thank You