



APPA Operations Update: Tools You Can Use to Build a Strong and Competitive Electric Utility

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Senior Vice President

American Public Power Association



80 Years of Powering Strong Communities

MUNICIPAL ELECTRIC UTILITIES OF WISCONSIN AND WISCONSIN ELECTRIC COOPERATIVE ASSOCIATION

Wisconsin Dells, WI

Today's Agenda

- Introduction
- Who is APPA
- APPA's Strategic Initiatives
- Engineering & Operations Strategic Projects
- Q&A

What Is Public Power?

Community-owned, not-for-profit public power utilities power homes and businesses in **2,000 communities** — from small towns to large cities.



#PublicPower

**PUBLIC POWER
UTILITIES
ARE LIKE OUR
PUBLIC
SCHOOLS
AND
LIBRARIES**



Community-owned

Division of local
government

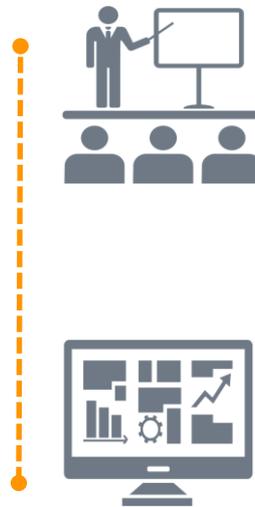
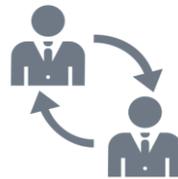


Elected or appointed
boards—mayors,
council members,
citizens

AMERICAN **PUBLIC POWER** ASSOCIATION

Trade association representing public power utilities across the U.S.

**MEMBER EDUCATION
AND INFORMATION**



**POLICY
ADVOCACY**

**BEST PRACTICES
AND RESOURCES**

APPA Members

- 1400+ public power utilities
- Retail service in 49 states
- Very large to very small systems
- *Median* size: 1,977 meters
- 14.4% of sales to electric consumers



1 IN 7
electricity customers in the U.S.
are served by public power

HOW MANY
PEOPLE
DOES A **PUBLIC
POWER
UTILITY** SERVE?

1,352
PUBLIC POWER
UTILITIES SERVE
UNDER 4K
PEOPLE

332
PUBLIC POWER
UTILITIES SERVE
4-10K
PEOPLE

45
PUBLIC POWER
UTILITIES SERVE
40-100K
PEOPLE

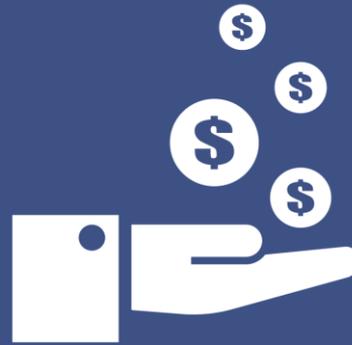
30
PUBLIC POWER
UTILITIES SERVE
100K+
PEOPLE

247
PUBLIC POWER
UTILITIES SERVE
10-40K
PEOPLE

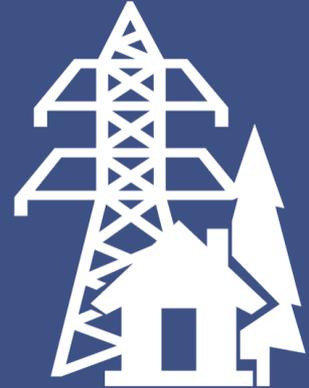
PUBLIC POWER



+



+

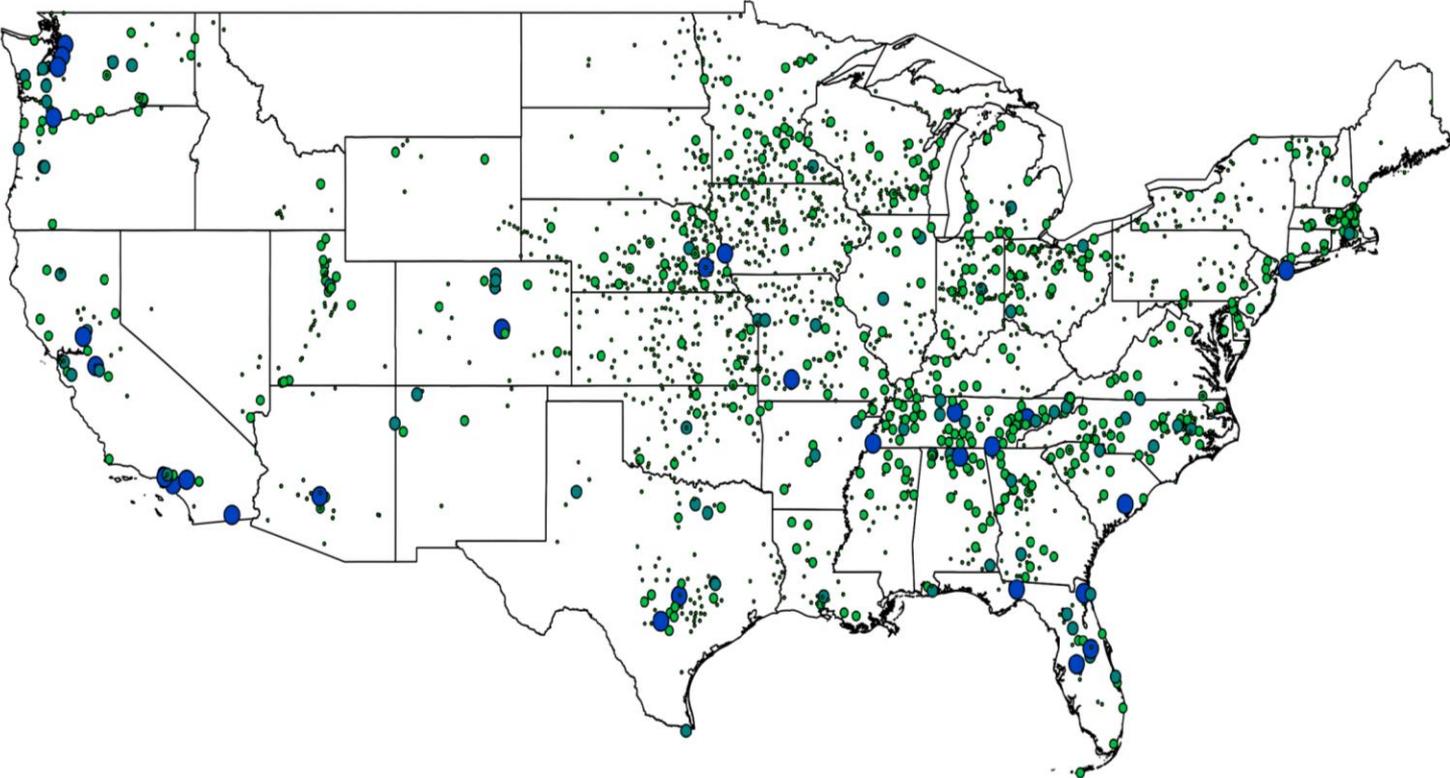


LOCAL CONTROL

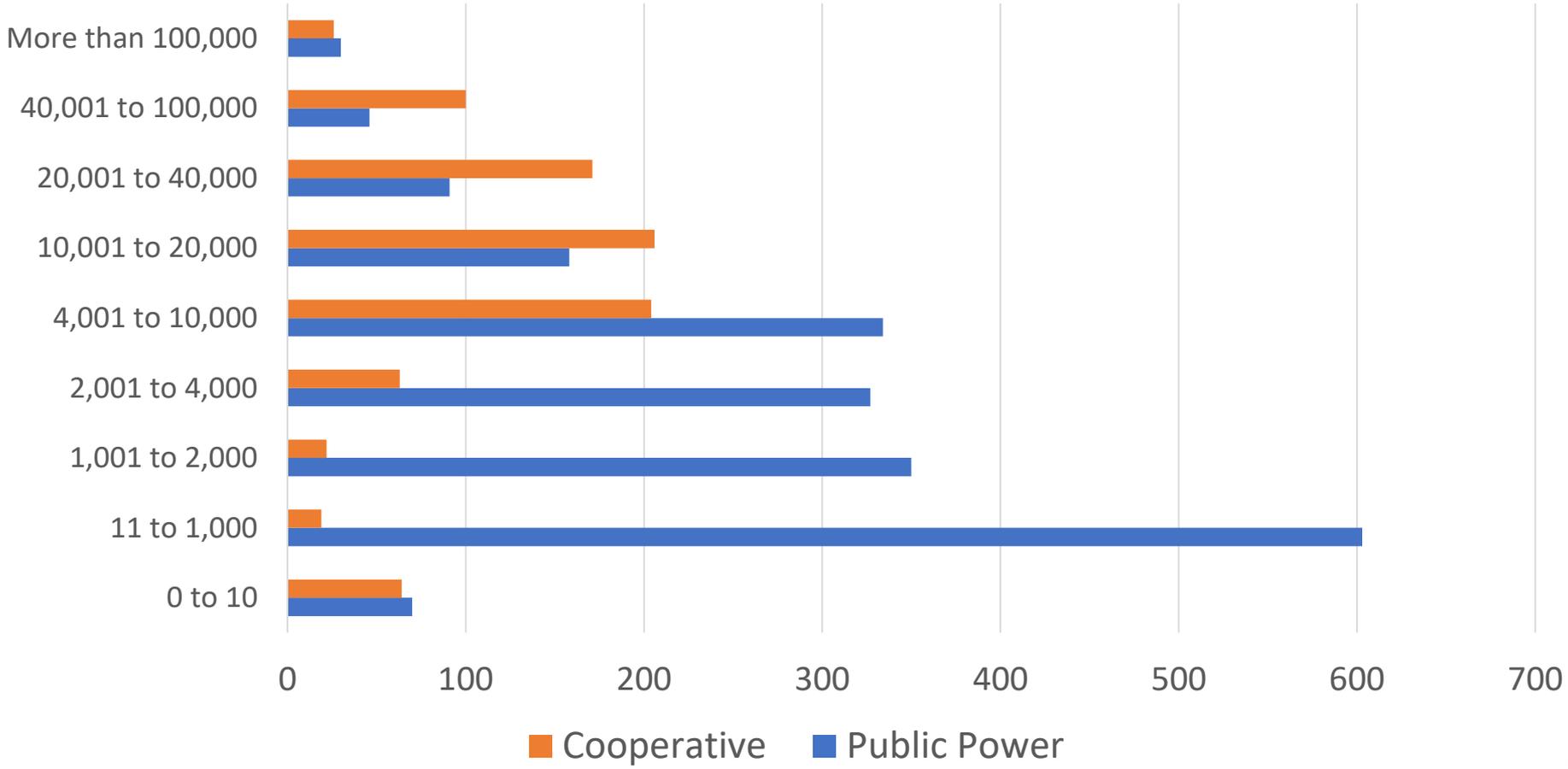
LOW RATES

HIGH RELIABILITY

Public Power By Location



Public Power and Cooperative Utilities by Customer Class



Seven External Initiatives

- Communicate the value of public power
- Address technological change
Public Power Forward
- Address adverse impacts of federal regulation
- Improve physical preparedness/reliability, cyber & physical security,
- Focus on research and development
- Help meet utility workforce challenges
- Promoting association excellence

Engineering & Operations : We're not your Daddy's APPA...



Safety



**Cyber-
security**



R & D



Reliability



Mutual Aid

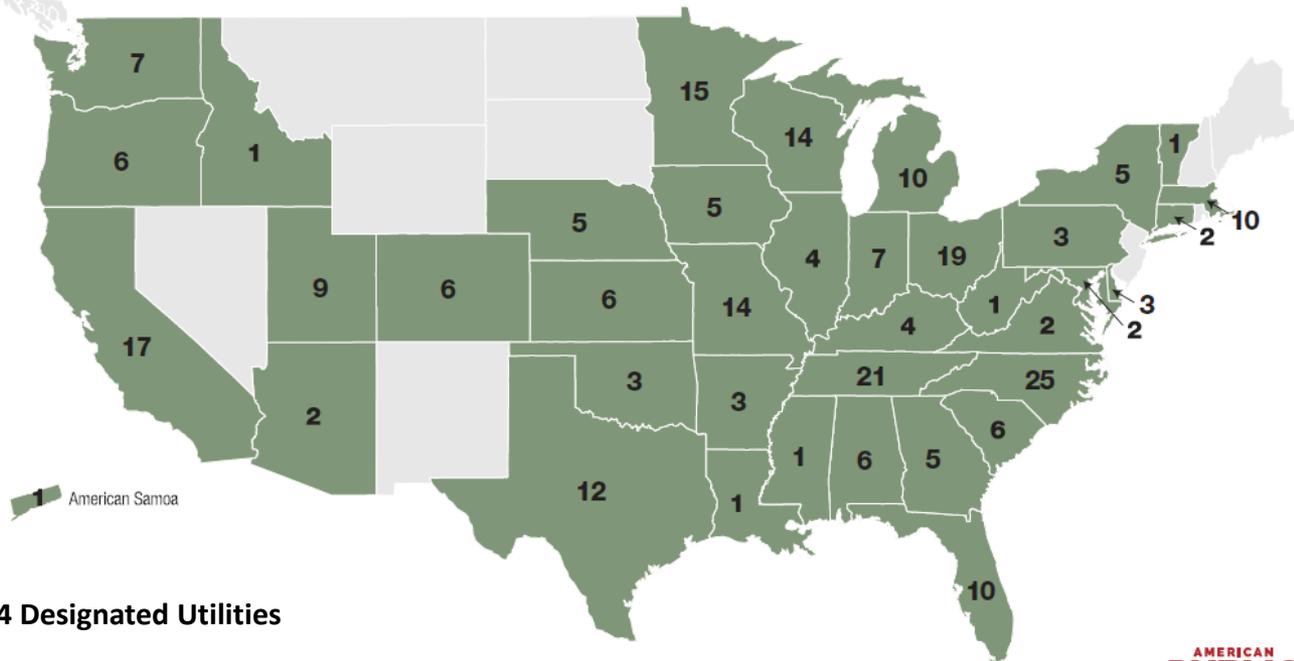
**Smart
Energy**

Reliability =
Operational Excellence

RP₃ Current Designees



State Representation of RP₃ Designated Utilities



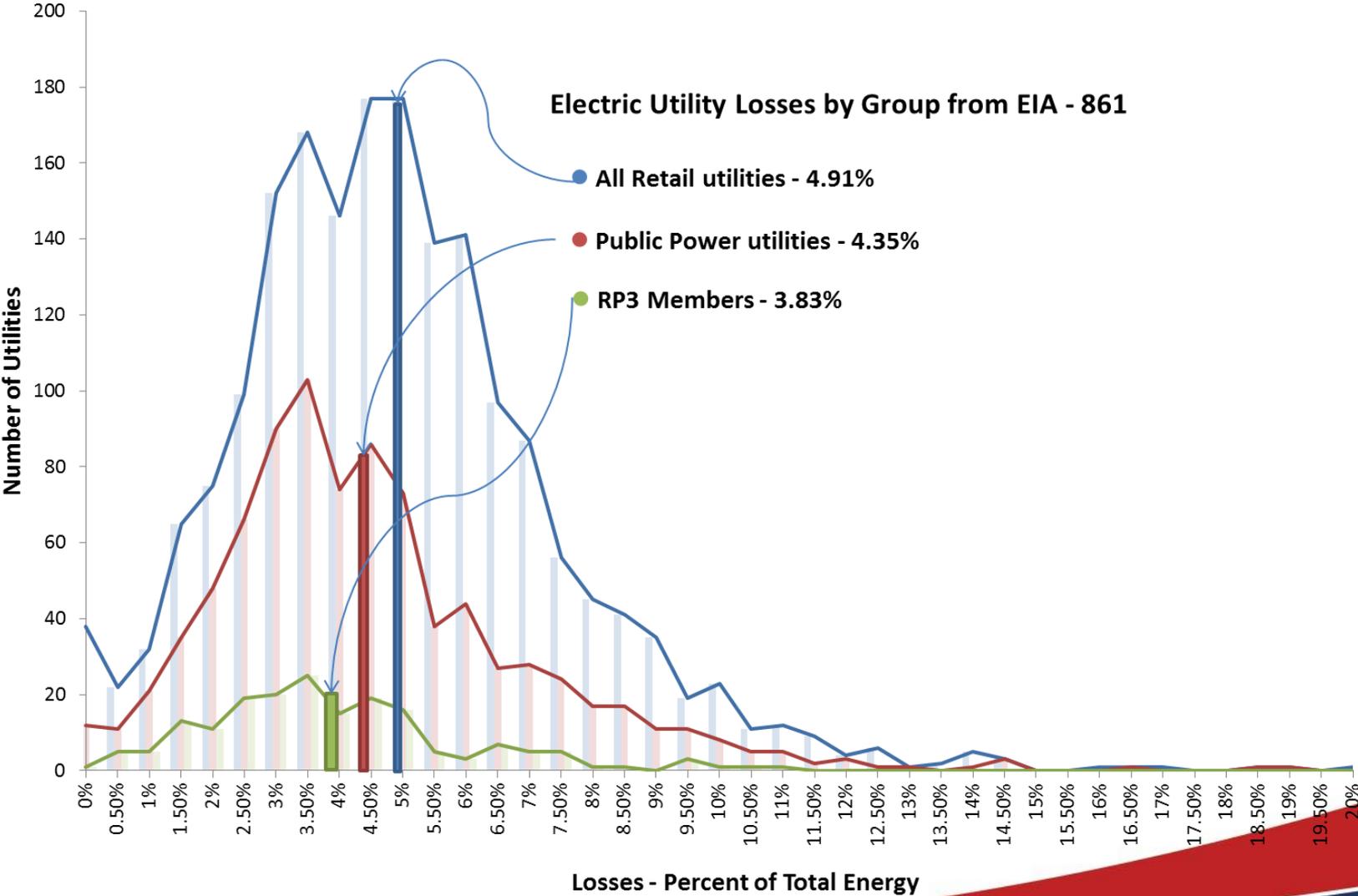
274 Designated Utilities

Nationwide 274 Designated Utilities

*Numbers indicate RP₃ utilities with designations beginning in 2017, 2018 and 2019

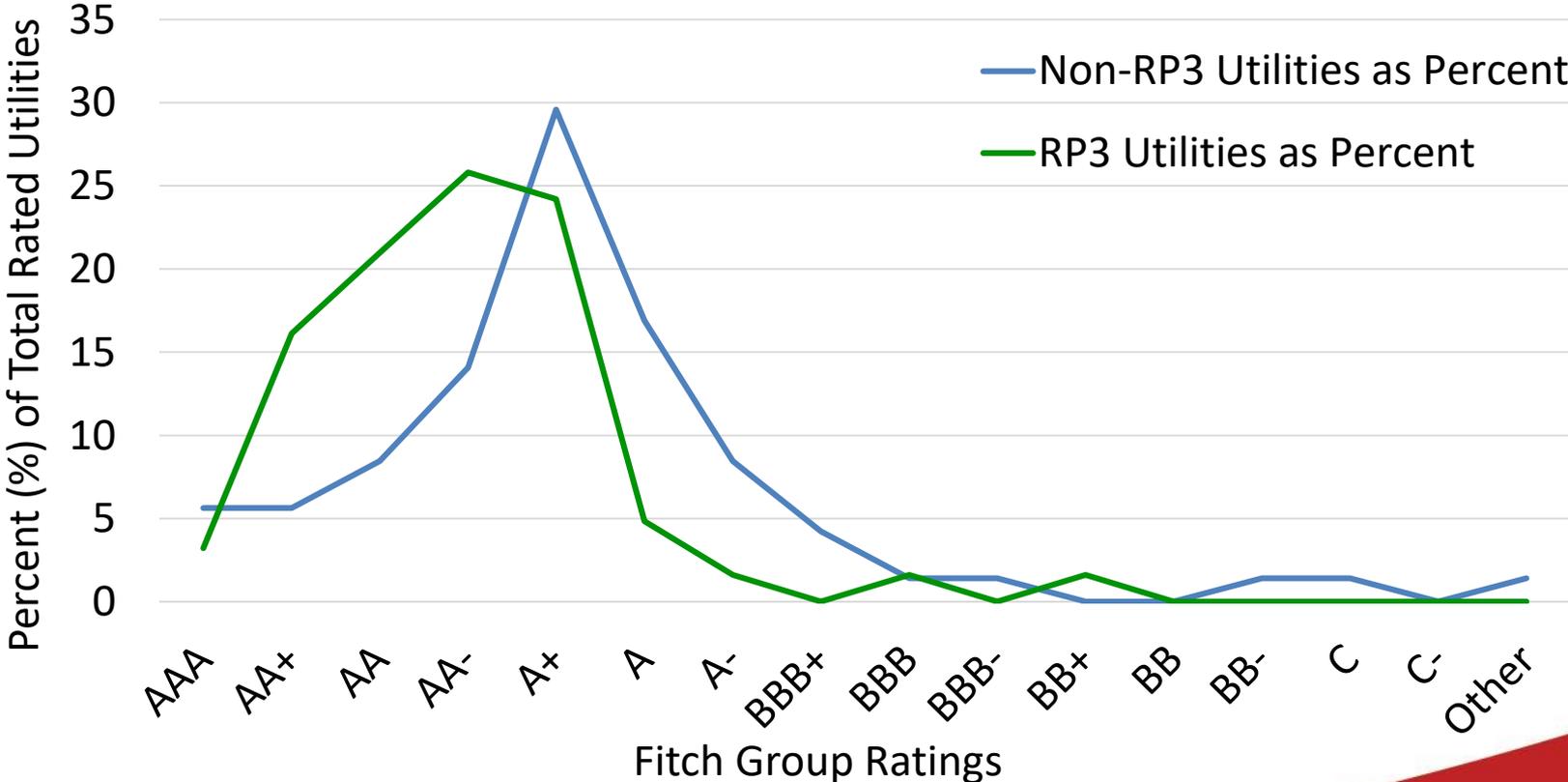


Why is RP₃ Important?



Why is RP₃ Important?

Fitch Group: RP3 vs Non-RP3 Ratings as Percent of Total



NOTE: Fitch Ratings were found for 71 non-RP₃ utilities and for 62 RP₃ utilities.

Wisconsin Activity – RP3

Utility	Year	Designation
Kaukauna Utilities	2017	Diamond
Menasha Utilities	2017	Platinum
Stoughton Utilities	2017	Diamond
Evansville Water and Light	2018	Platinum
Manitowoc Public Utilities	2018	Diamond
Oconomowoc Utilities	2018	Diamond
Richland Center Electric Department	2018	Diamond
River Falls Municipal Utilities	2018	Platinum
Sun Prairie Utilities	2018	Platinum
Two Rivers Water & Light	2018	Diamond
Wisconsin Rapids Water Works & Lighting Commission	2018	Diamond
Cedarburg Light and Water Commission	2019	Platinum
Marshfield Utilities	2019	Diamond
Plymouth Utilities	2019	Gold

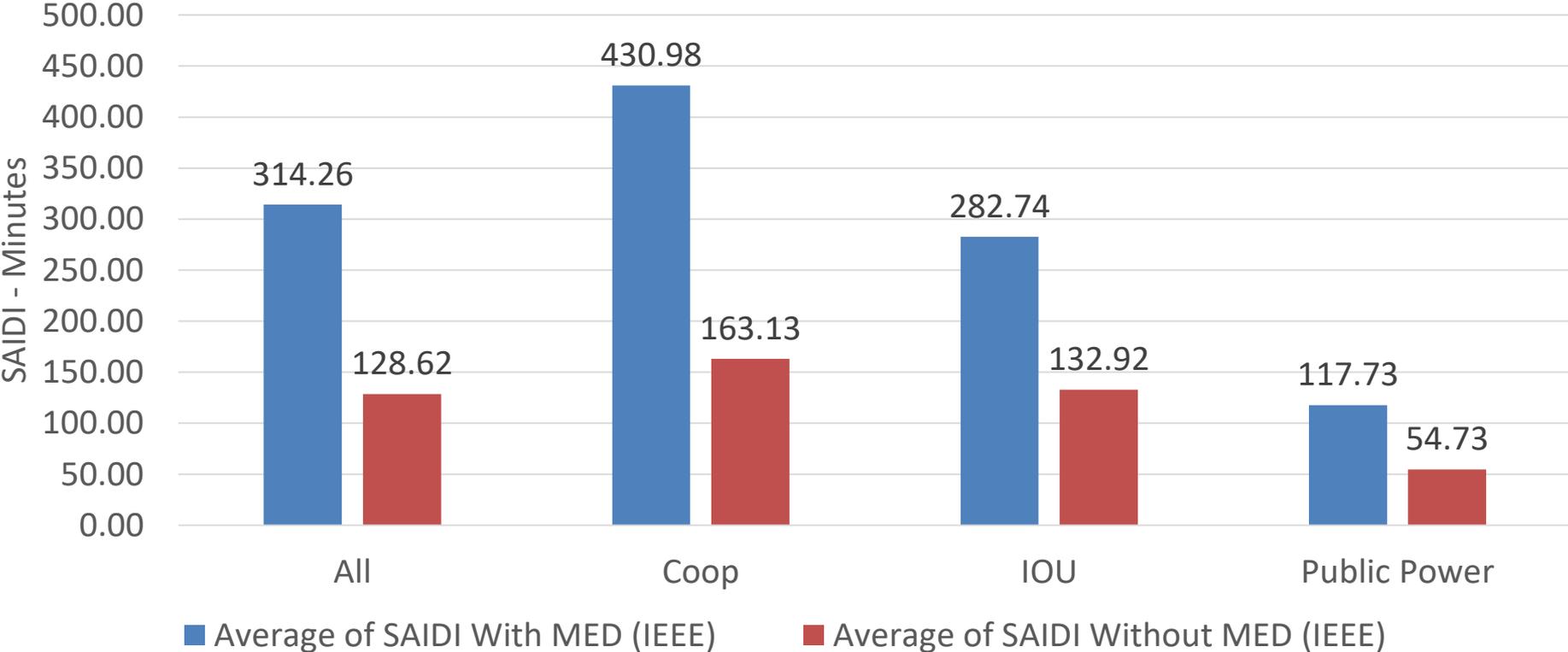
What is the eReliability Tracker?

- The eReliability Tracker is a web-based application that helps over 425 public power utilities record, track, and analyze outage data.
- National, regional, and utility size-based benchmarking data
- Eligibility to receive a certificate recognizing excellence in reliability

Top 10 Circuits Ranked by Outage Count		
Circuit Name	Substation Name	Number of Outages
Circuit 4	Central Substation	4
NS Circuit 1	North Substation	3
NS Circuit 1 Gold Hill	North Substation	2
Circuit 2	North Substation	1
Circuit 5	Central Substation	1

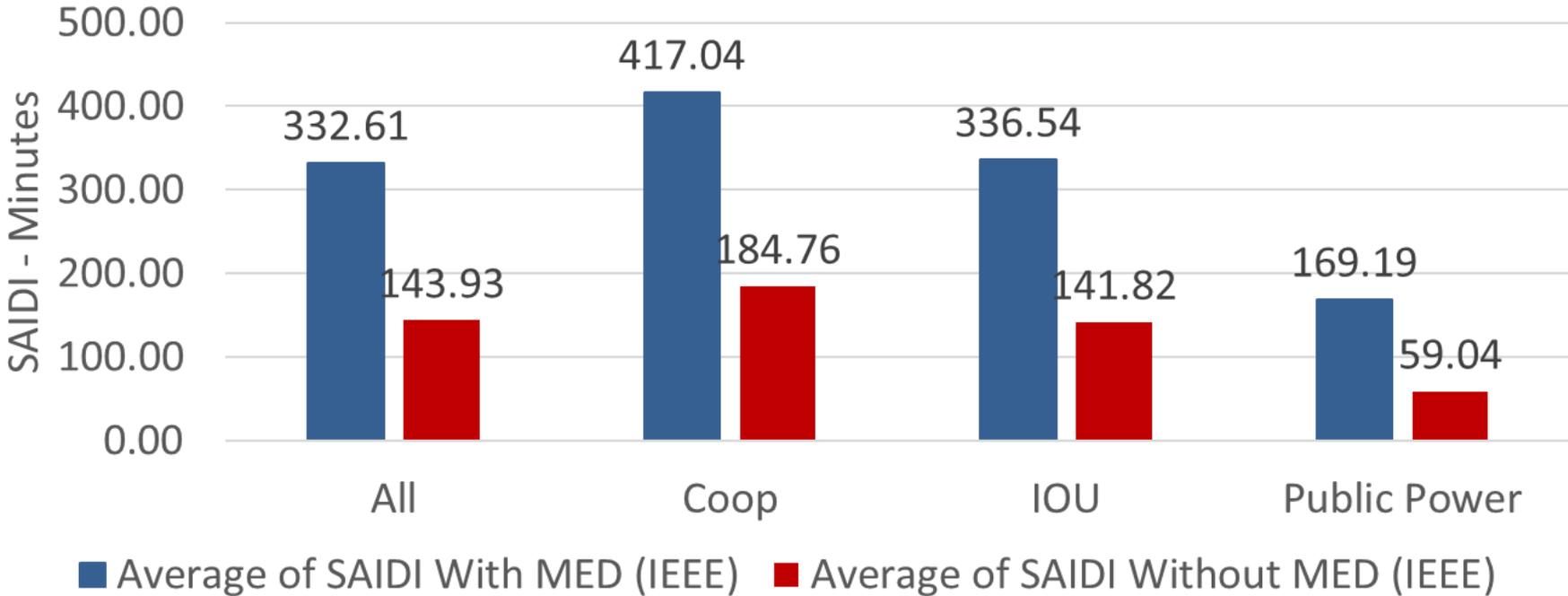
Public Power Reliability is Superlative!

2016 EIA Reliability Data - SAIDI

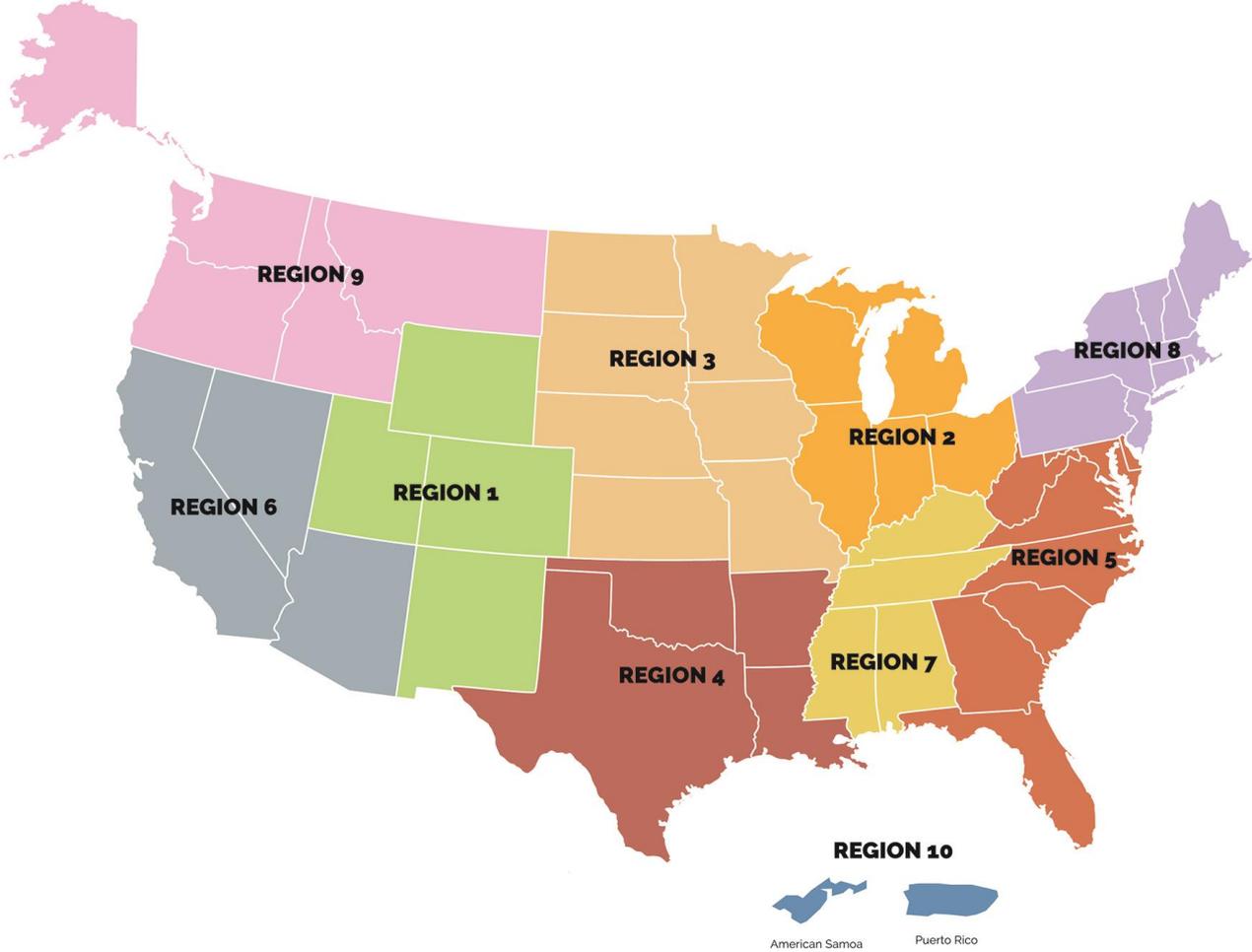


Public Power Reliability is Superlative!

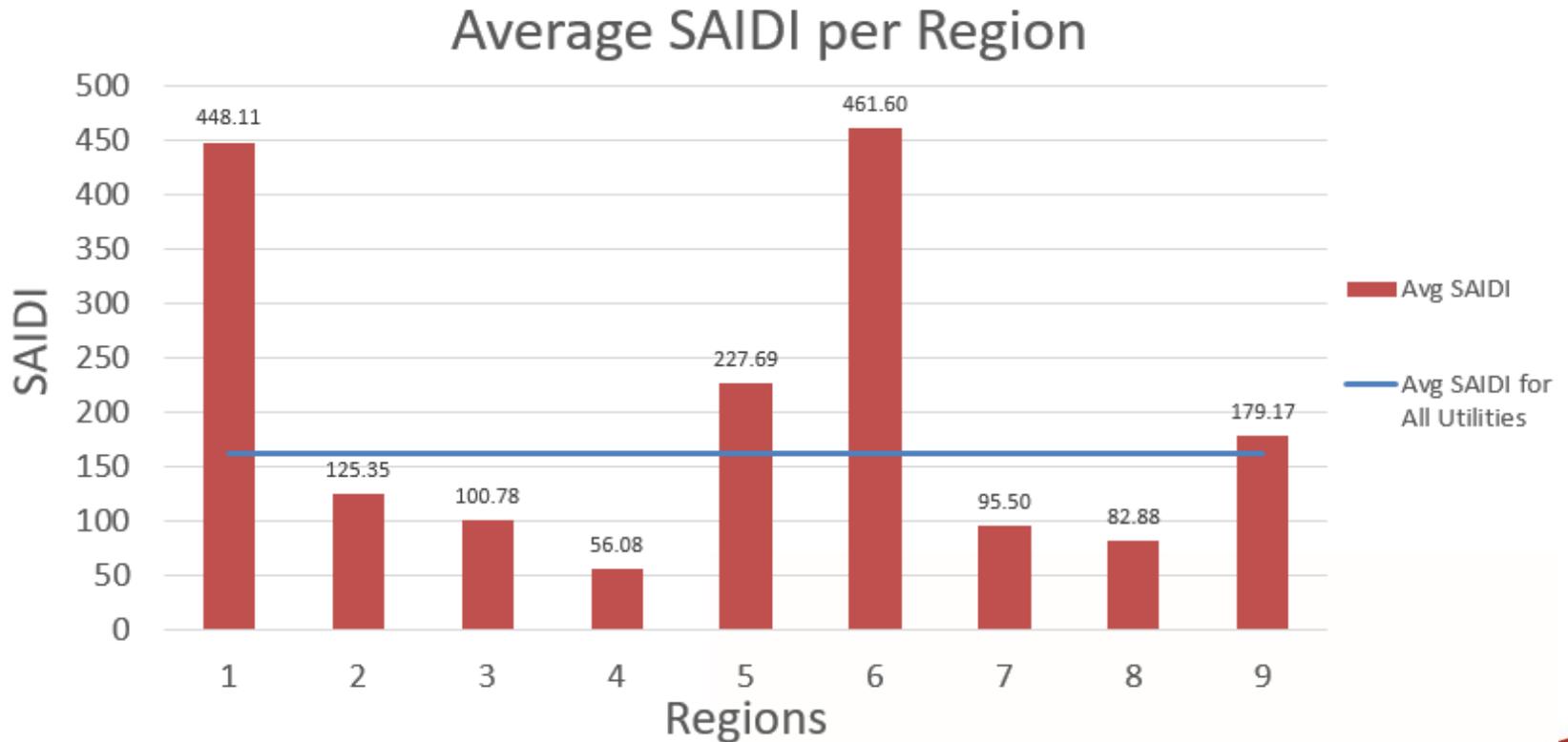
2018 EIA Reliability Data - SAIDI



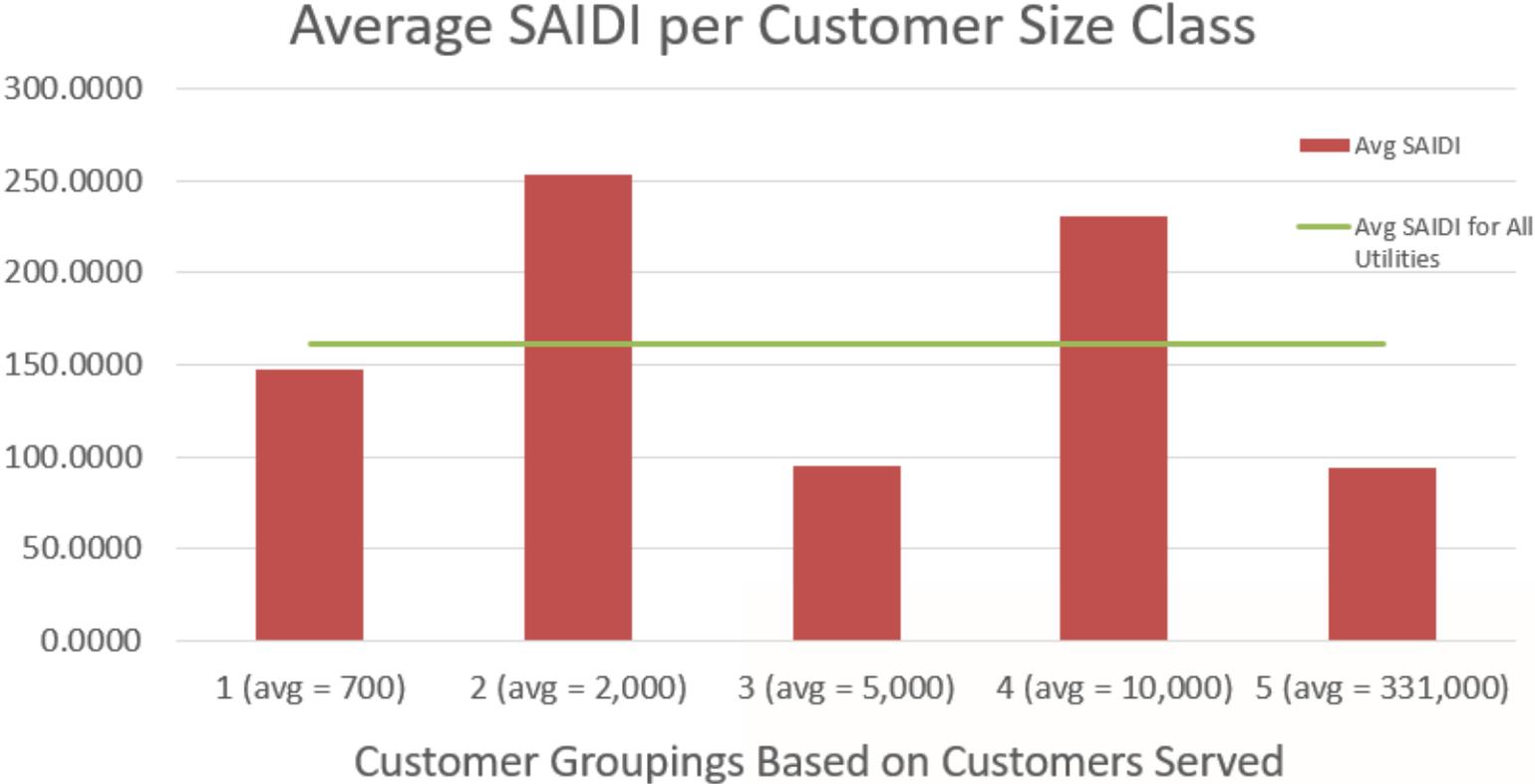
Map of APPA regions



System Average Interruption Duration Index, SAIDI by Region



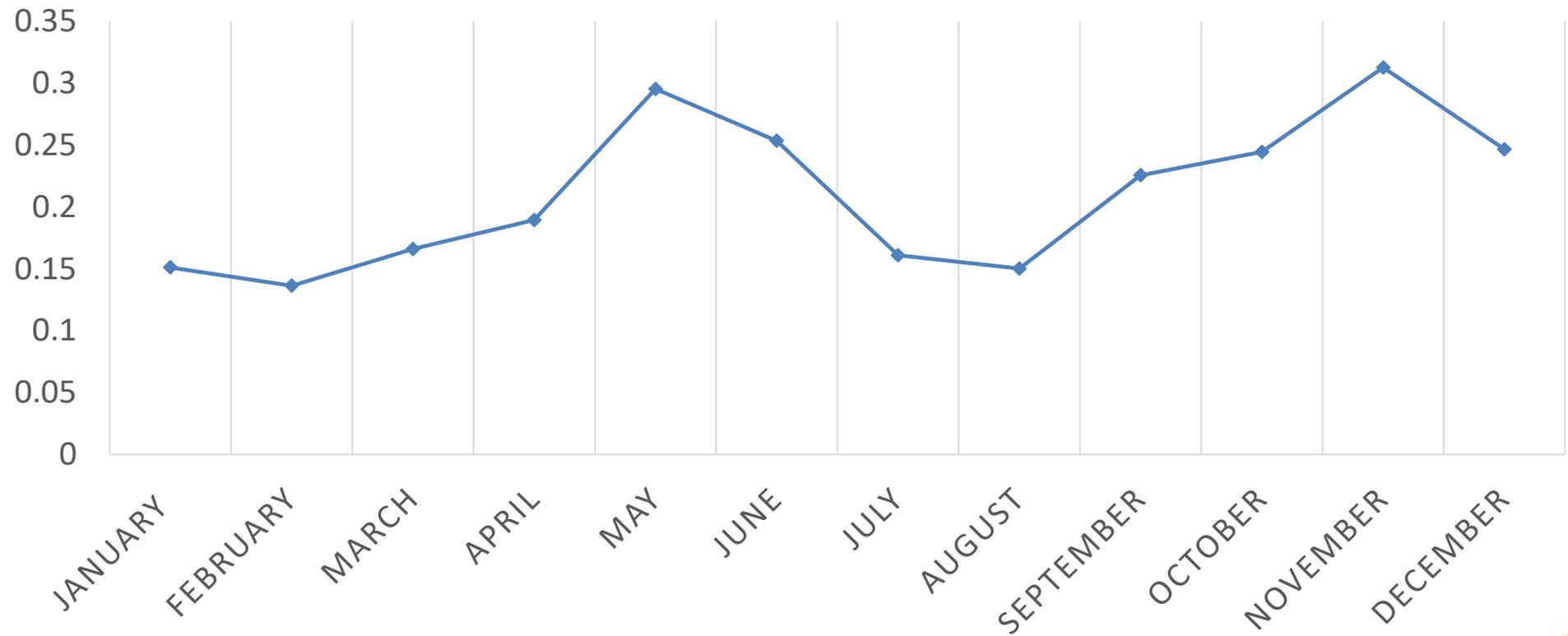
System Average Interruption Duration Index, SAIDI by Customer Size Classes



Squirrel Outage Patterns

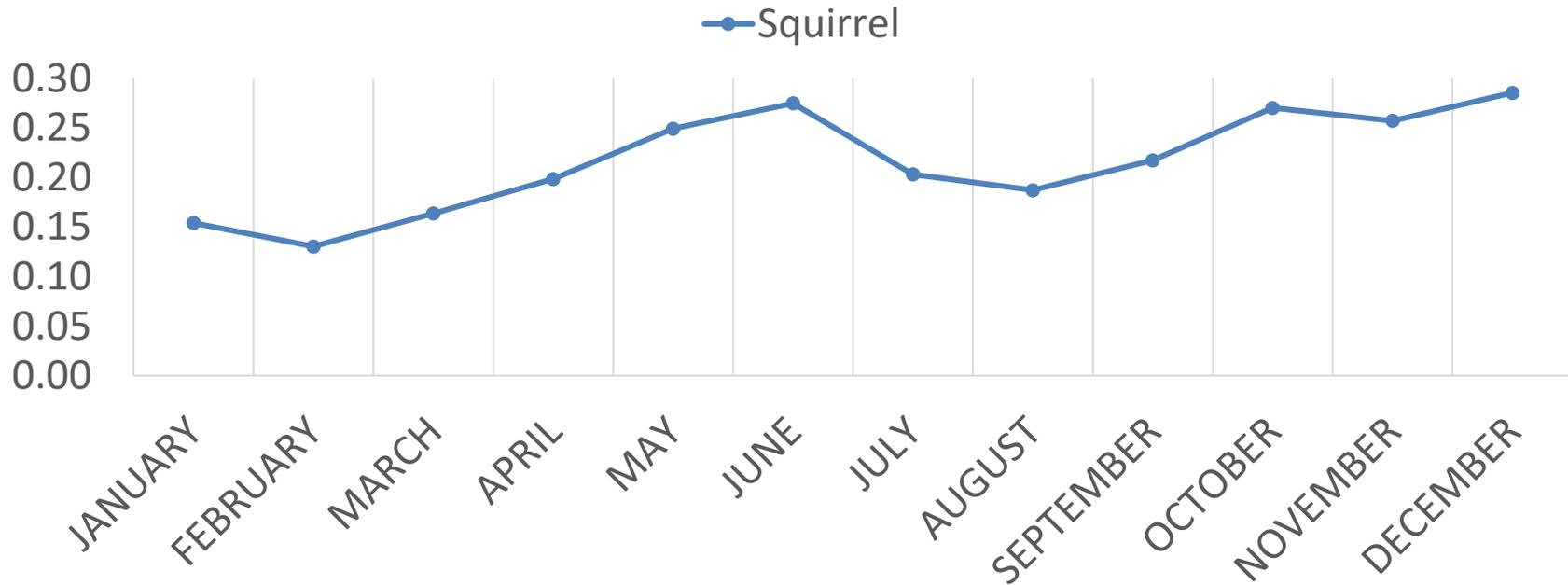
SQUIRREL INDEX IN 2017

—◆ Squirrel

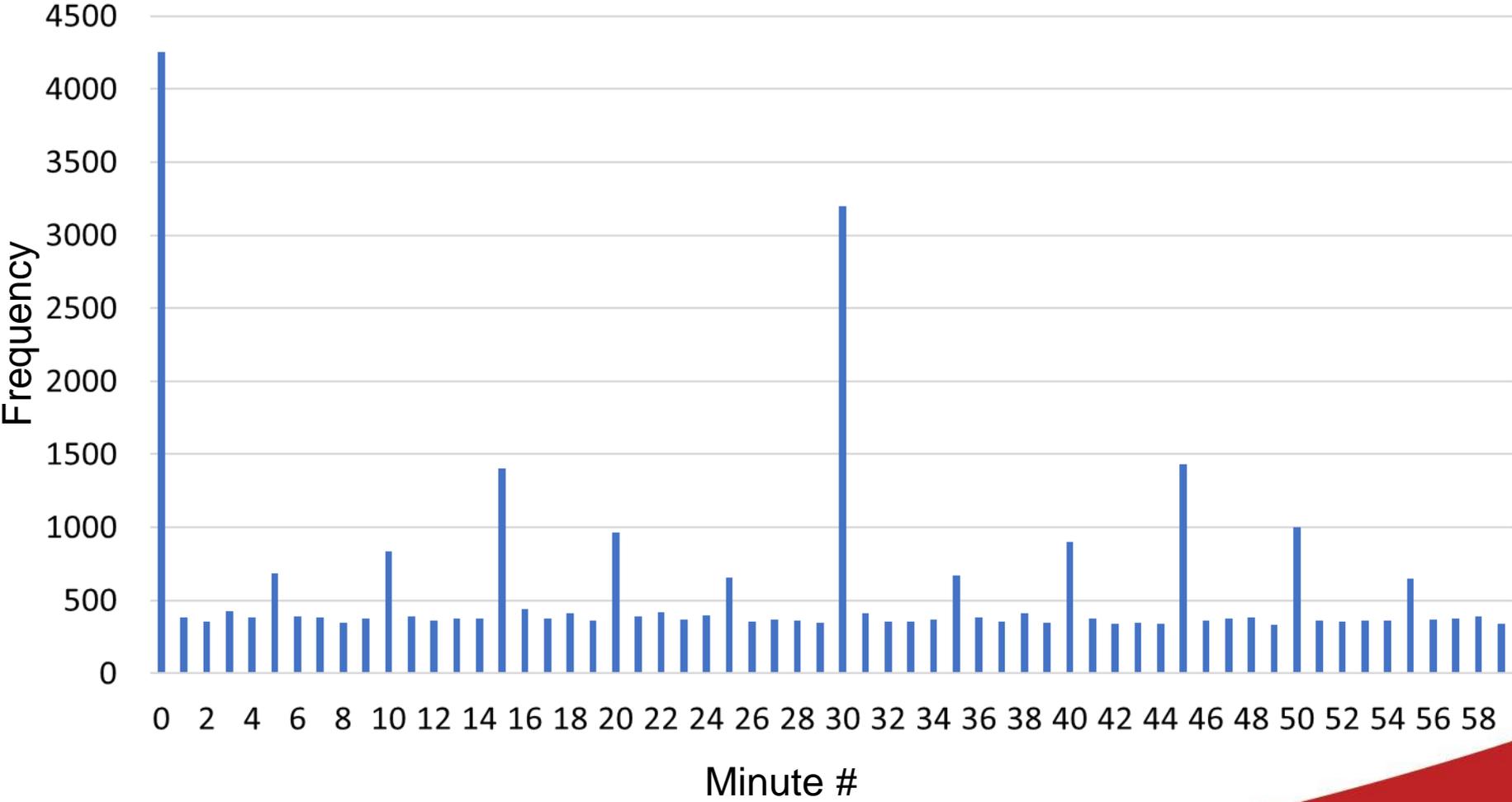


Squirrel Outage Patterns

SQUIRREL INDEX IN 2018



Outage Start and End Time Patterns



Outage Start Time

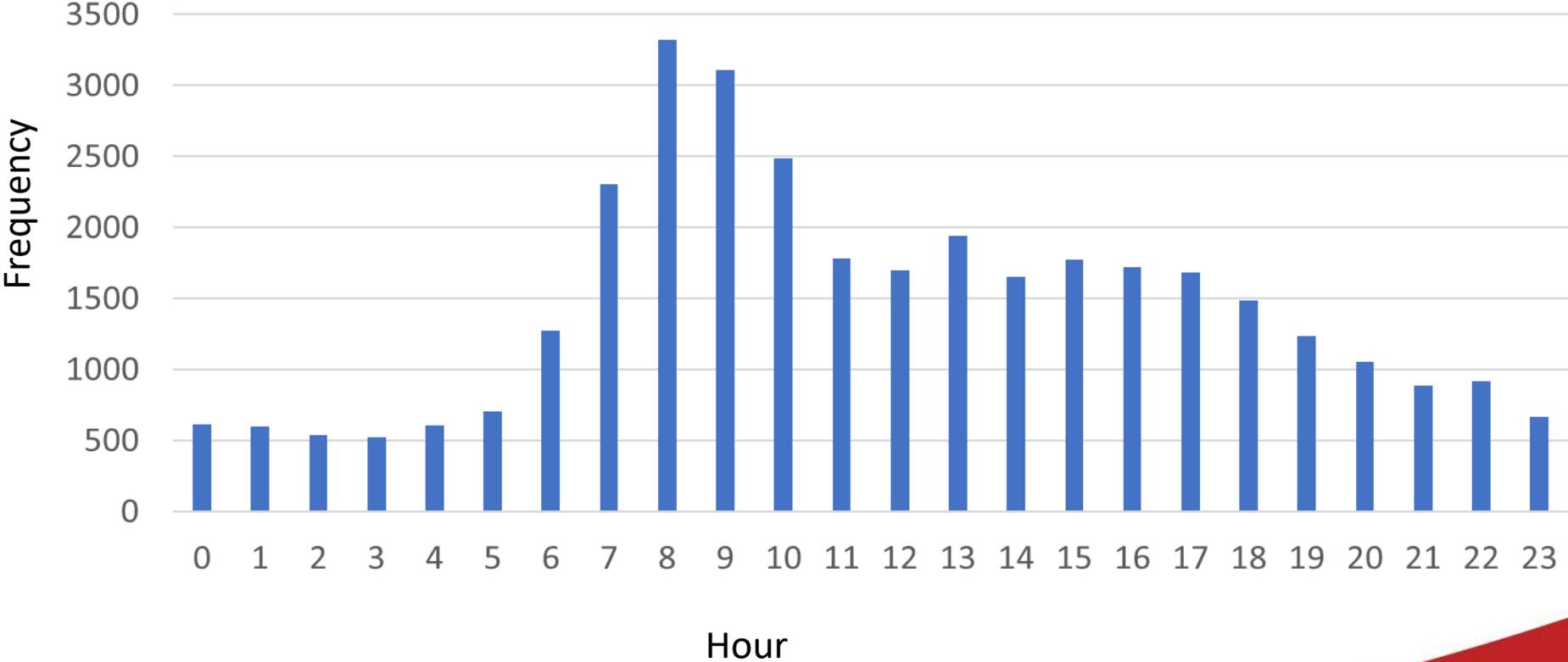


Figure 8

Top five customer-weighted occurrence rates for common causes of sustained outages for all utilities that use the eReliability Tracker Service ²

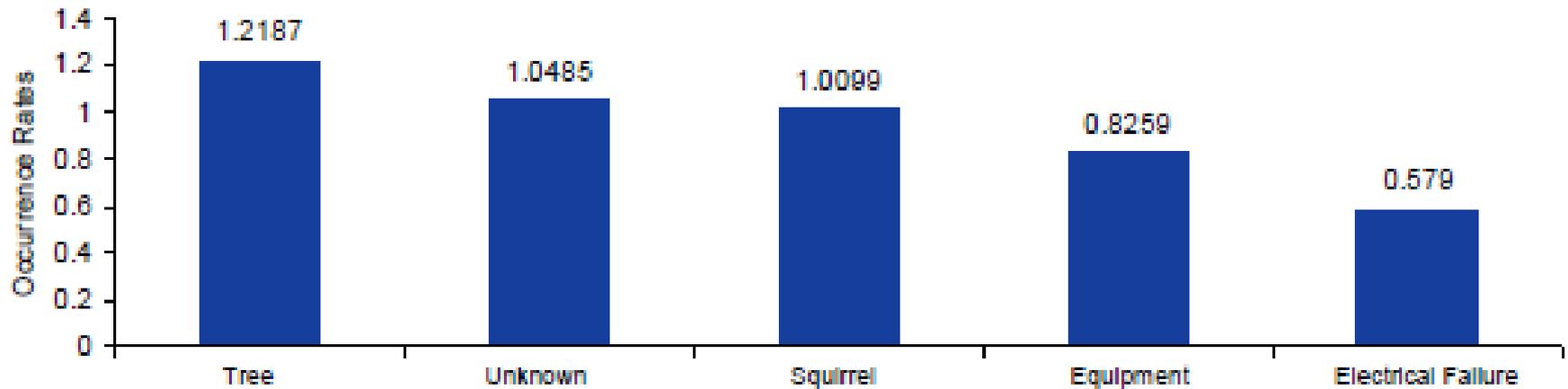
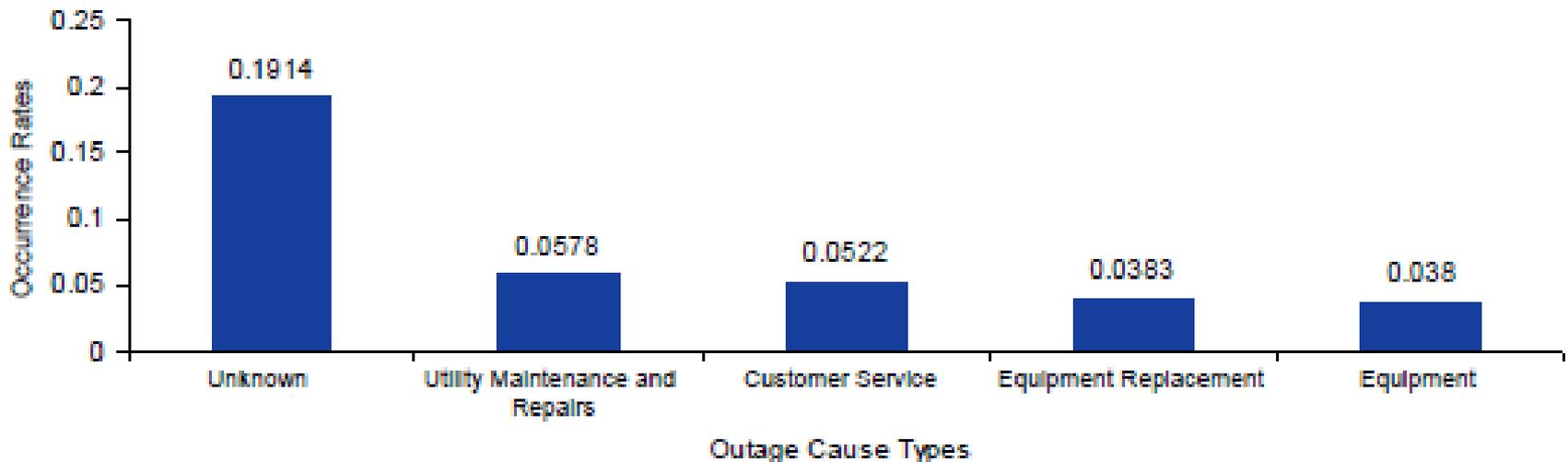


Figure 11

Top five customer-weighted occurrence rates for common causes of momentary outages for all utilities that use the eReliability Tracker Service ²



Wisconsin 2018 EIA and 2018 eRT Reliability Statistics

SAIDI		Cooperative	Investor Owned	Municipal
EIA National Reliability 2018 Data	Utility Count	15	6	20
	Average of SAIDI With MED	171.98	95.82	45.07
	Average of SAIDI Without MED	97.92	65.93	21.43
<hr/>				
eRT Reliability 2018 Data	Utility Count			17
	Average of SAIDI With MED			66.33
	Average of SAIDI Without MED			24.89
<hr/>				
SAIFI		Cooperative	Investor Owned	Municipal
EIA National Reliability 2018 Data	Utility Count	7	7	11
	Average of SAIFI With MED	1.02	0.67	0.47
	Average of SAIFI Without MED	0.76	0.56	0.32
<hr/>				
eRT Reliability 2018 Data	Utility Count			17
	Average of SAIFI With MED			0.505

CERTIFICATE OF EXCELLENCE IN RELIABILITY



This is to acknowledge that

has achieved excellence in reliability by significantly outperforming the electric industry national average as reported by the Energy Information Administration.

MARCH 1, 2018

Date

Michael J. Hyland
Senior Vice President,
Engineering Services



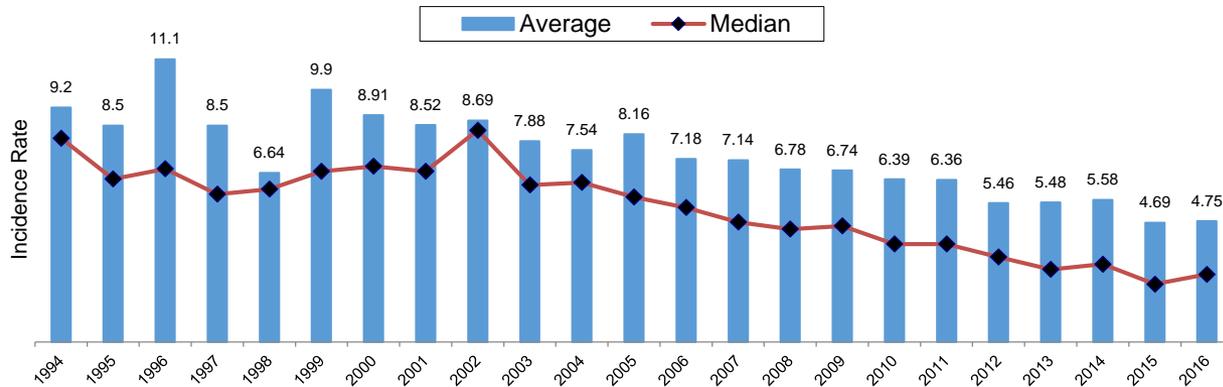
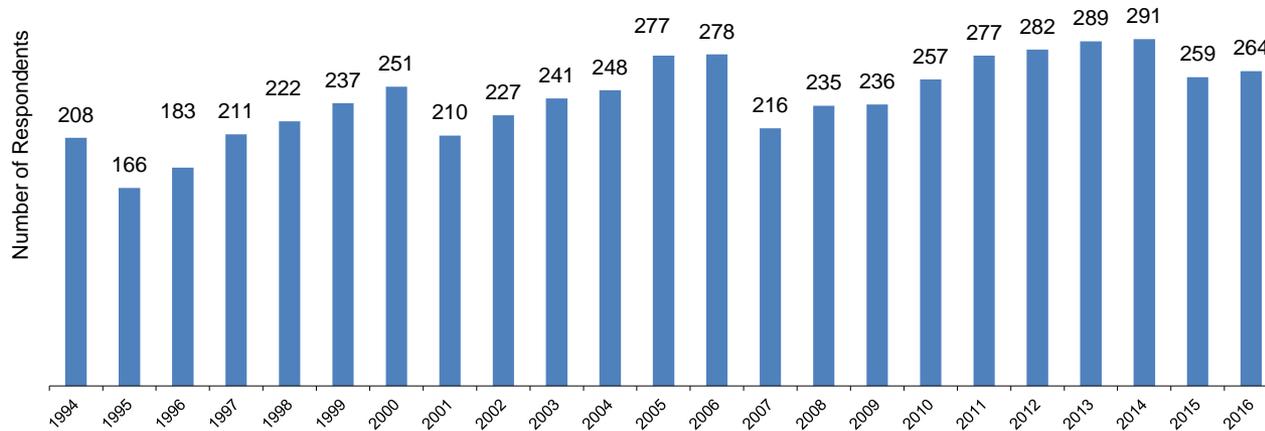
Wisconsin: “The Reliable State!”

16 Certificate of Excellence in Reliability Awardees (out of 18)

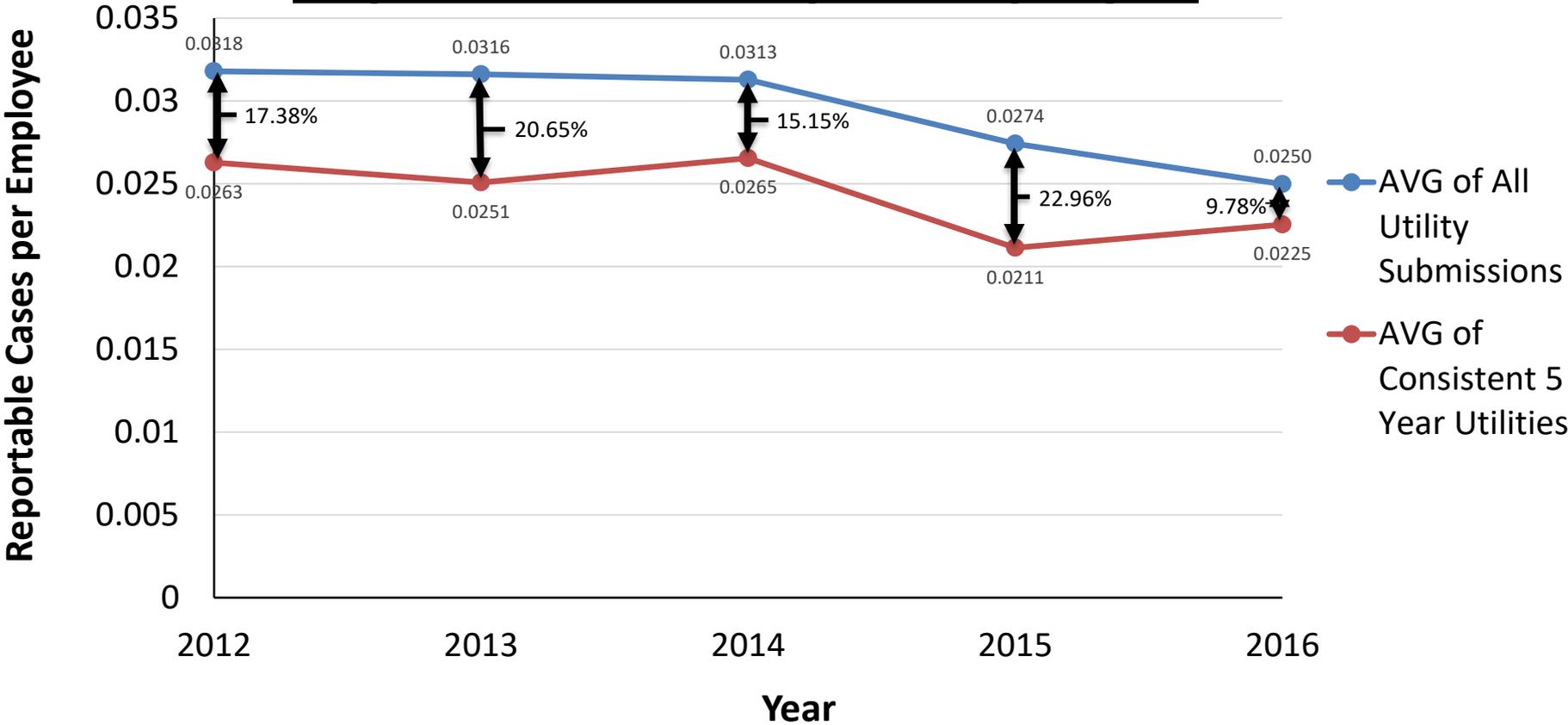
- City Utilities of Richland Center (2018, 2016, and 2015 data)
- Evansville Water & Light (2018, 2017, 2016, and 2015 data)
- Florence Utility Commission (2018 data)
- Hustisford Utilities (2017, 2016, and 2015 data)
- Kaukauna Utilities (2018 data)
- Manitowoc Public Utilities (2018, 2017, 2016, and 2015 data)
- Marshfield Utilities (2018, 2017, 2016, and 2015 data)
- New London Electric & Water Utility (2015 data)
- Oconomowoc Utilities (2018, 2017, 2016, and 2015 data)
- Rice Lake Utilities (2018, 2017, 2016 data)
- River Falls Municipal Utilities (2018 , 2017, and 2015 data)
- Stoughton Utilities (2015 data)
- Sturgeon Bay Utilities (2018, 2017, and 2016 data)
- Sun Prairie Utilities (2018 data)
- Waunakee Utilities (2018, 2017 data)
- Waupun Utilities (2018, 2017, 2016, and 2015 data)

Safety Awards of Excellence

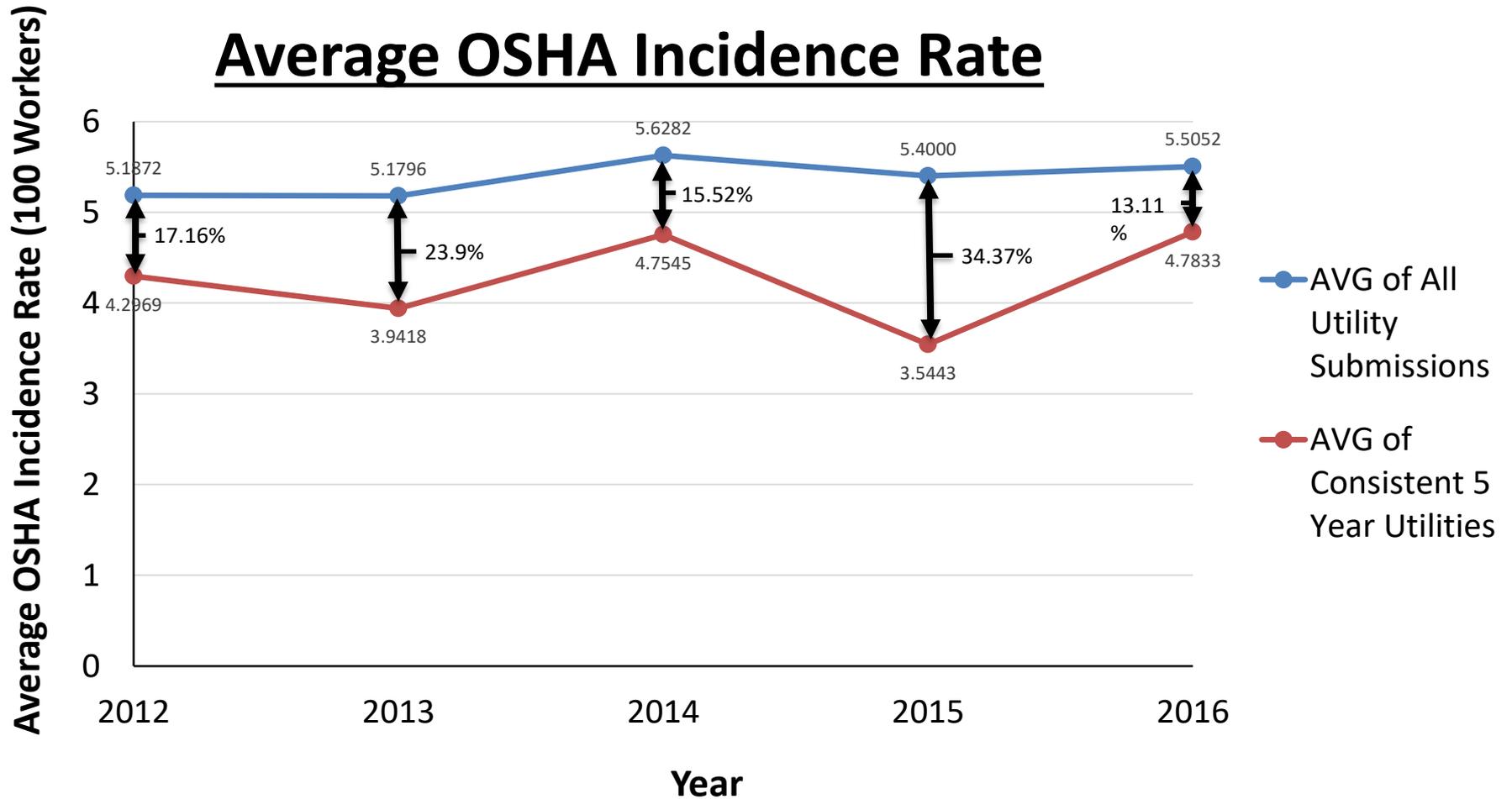
Total Entries per Year (2016)



Reportable Cases per Employee

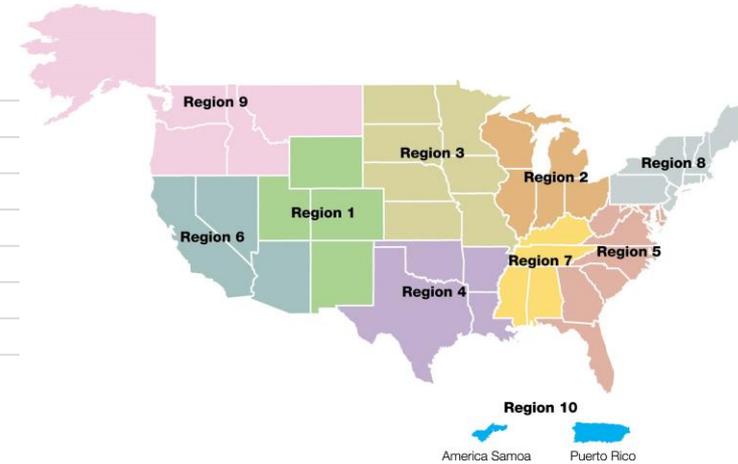
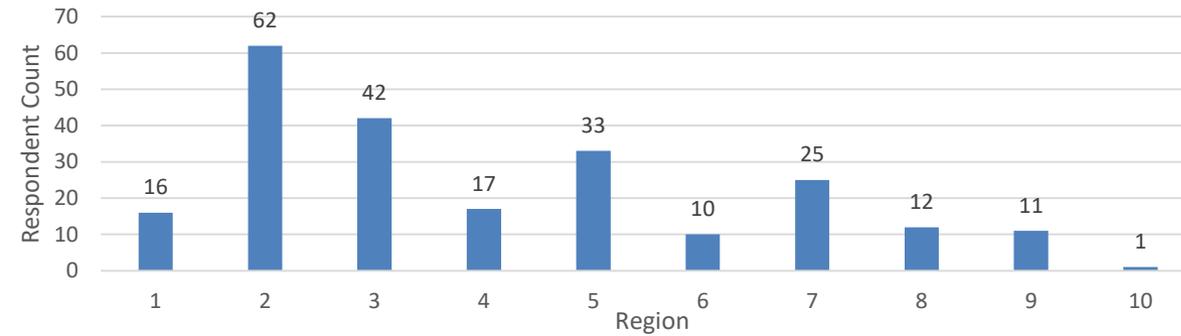


Average OSHA Incidence Rate

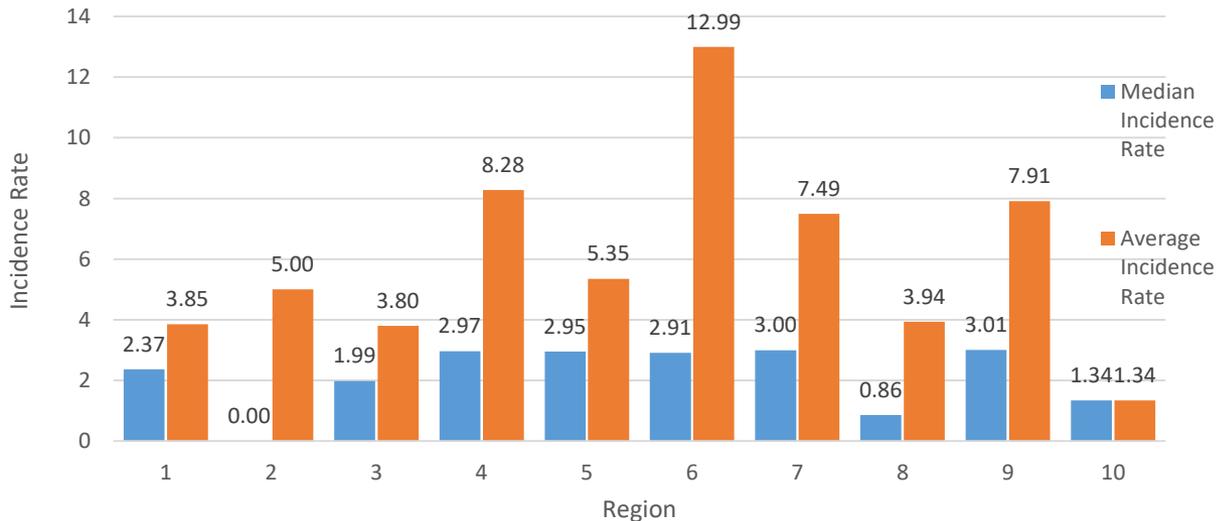


Safety Awards of Excellence Data

Count of All Respondents by Association Region (2016)

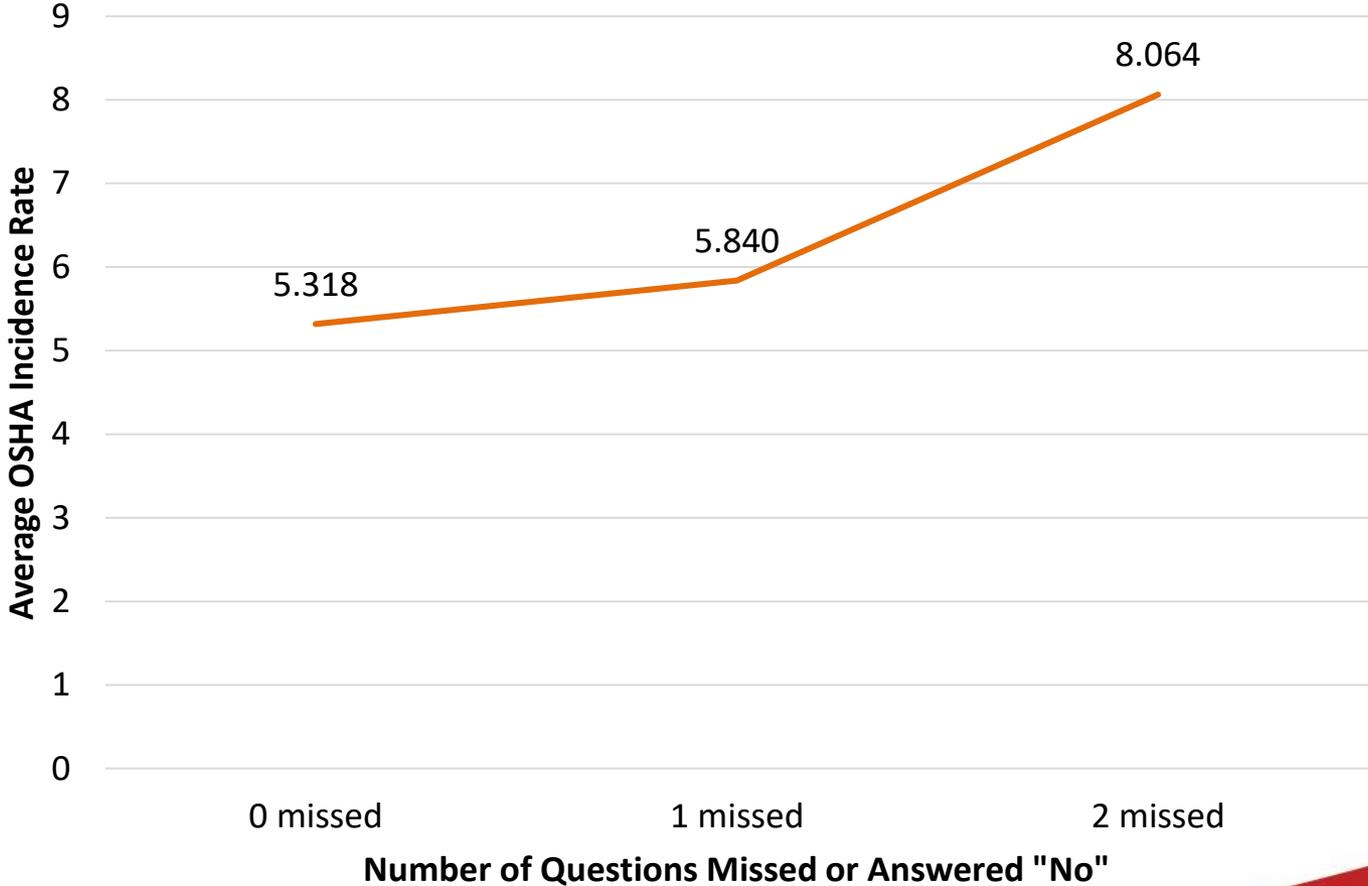


Average and Median Incidence Rates by Association Region (2016)



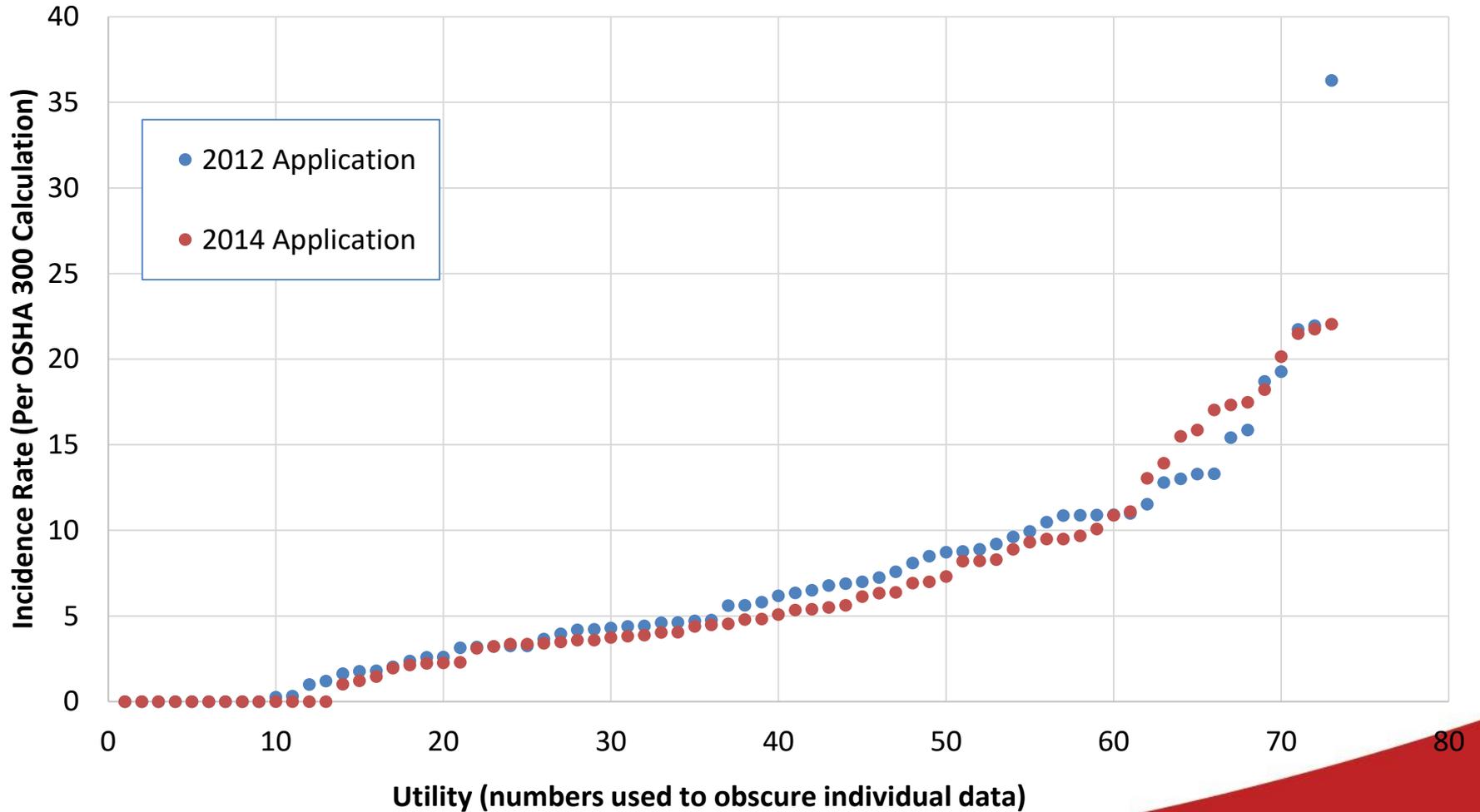
RP₃ Application Data

Average OSHA Incidence Rate by Number of "No" Responses to Safety Questions on the RP3 Application for 2012-2016



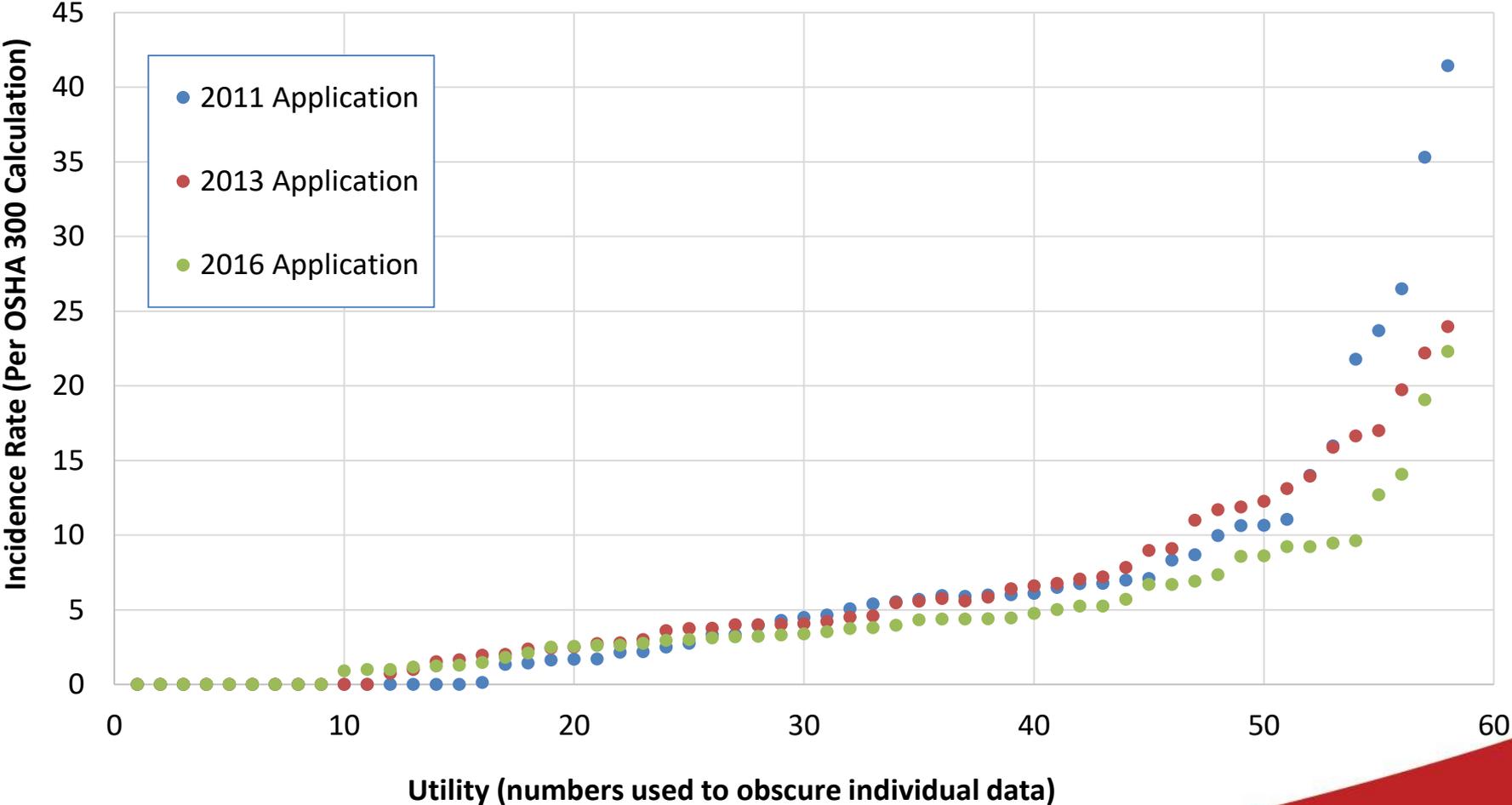
RP₃ Application Data

Safety Index Over the Years



RP₃ Application Data

Safety Index Over the Years



eSafety Tracker

- The eSafety Tracker will help utilities document and analyze safety-related events: Meetings, job briefings, injuries, near-misses, investigation reports
 - Utilities will be able to run reports on their incident history
 - Better data allows for a better understanding of root causes of incidents and allows deeper understanding of utility safety
 - Better data collection on incidents should help improve safety rules through the APPA Safety Manual in the long run
- 

Home/Message of the Day

Safety Meeting/Briefing Incidents Reports Safety Manual Manage

tesster

Message of the Day at TESST APPA Utility

Be courteous. Never pile material in such a way that it will endanger a worker who has to work on it or will make a backbreaking job for the worker who breaks down the pile. Be sure to consider the strength of the support if you're piling material on a floor, platform or scaffold; the stability of the ground if you're piling a heavy load; and the height of the pile so it won't topple.

Welcome to the American Public Power Association's eSafety Tracker service! Worker safety is at the core of a public power utility's commitment to service, and we hope the Tracker will help improve safety at your utility. Tracking safety performance helps underscore a utility's commitment to a culture of safety.



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Allows 'Leaders' to set different daily messages regarding safety and safety culture

Meeting/Briefings: Record Meeting

Safety Meeting/Briefing Incidents Reports Safety Manual Manage tesster

Record Meeting Record Briefing

New Meeting for TESST APPA Utility

Date and Time *

Date Time

Date and time when the meeting occurred

Presenter(s)

Person(s) that led the meeting. Can be a non-employee.

Meeting Description *

Please list all crew members that attended this meeting

Meeting Details

Please provide a summary list of safety topics discussed and/or covered by the meeting

Administrative Notes

Save Cancel

- Create Meetings, keep track off:
 - Attendees
 - Presenters
 - Administrative notes
 - Date/time
 - Meeting Description/Details

Meeting/Briefing: Record Briefing

Safety Meeting/Briefing Incidents Reports Safety Manual Manage tesster

Record Meeting Record Briefing

New Briefing for TESST APPA Utility

Date and Time *

Date Time

Date and time when the briefing occurred

Person(s) Responsible *

Job Description *

Job ID

Unique identifier for the Job

Work Location *

Location where the job will be/was performed (address or description)

Please list all crew members that attended this briefing

The following items have been covered as a part of this briefing

Hazards Associated with the Job *

Yes No

Were Hazards Associated with the Job discussed during this briefing?

Hazards Associated with the Job notes

Work Procedures Involved *

Yes No

Were involved work procedures discussed during this briefing?

Work Procedures Involved notes

Special Precautions *

Yes No

Were special precautions discussed during this briefing?

Special Precautions notes

- Create Safety Briefings, keep track off:
 - Person(s) responsible
 - Job Description/ID
 - Date/time
 - Attendees
 - Work Location
 - Hazards Associated/Work Procedures involved
 - Checklists

Meeting/Briefing: Record Briefing Continued

- Checklists to walk through important PPE and situational awareness issues.

Additional Briefing Item Details *

Hazards Associated with the Job

- Hazardous Atmosphere
- Engulfment
- Fall Hazard
- Chemical Hazard
- High Noise Levels
- Moving Machinery
- Environmental Hazard
- Traffic
- Other Utilities
- Critical Safety Equipment
- Special Precautions**
- Attendant/Observer
- Continuous Monitor/Atmosphere
- Weather
- Cover Up
- Caution, Hold, Clearance Order, Foreman's safety Guard

Recommended Pre-Job Preparation *

- Confined Space Entry Checklist
- Procedure/Rescue Plan
- Cones Behind Vehicle
- Lock Out Tag Out
- Proper Signage In Place
- Proper Tools For Job
- Communicate With Others In Area
- Proper Equipment

Safety Hazards Assessment Checklist *

1. Crew Information

- Emergency procedures
- Understanding of jobs
- All hazards understood
- First aid/CPR qualified
- Fire
- First Aid Kit

2. Personal Protection

- Hard hat
- Hand protection
- Eye/Face
- Foot protection
- Hearing protection
- Fall protection
- Lanyard/harness
- Rubber goods
- Low voltage gloves
- Non-synthetic clothes
- Respiratory

3. Personal Positioning - Consider

- Being struck by
- Being caught in between
- Being under the load
- Electrical contact
- Falling from
- Lifting methods

4. Work Area Conditions

- Uneven ground
- Muddy ground
- Slippery surfaces

5. Electrical Equipment

- Check voltage rating
- Check dual voltage switch
- Test voltage before energizing

Energy Source Controls

- Lockout/Tagout
- Testing
- Grounding
- Capacitor Discharged
- Induced Voltage
- Overhead Electrical Work Procedures

Work Procedures Involved

- Underground Electrical Work Procedures
- Voltage Testing
- Atmospheric Testing
- Confined Space Entry Requirements
- Excavation/Trench Protection
- Energized Electrical Work
- De-energized Electrical Work
- Trucks/Machine Grounding
- Traffic Control/Warning Equipment, Barricades, Cones
- Other
- Head Protection

Personal Protective Equipment

- Eye Protection
- Work Gloves
- Rubber Gloves/Sleeves
- FR Clothing
- Harness/Lanyard
- Proper Footwear
- Hearing Protection
- Respiratory Protection
- Daily Inspection

Trucks/Equipment/Tools

- Operational Check
- Tools Available
- Tools Inspected

MSDS For Substances In Area

- Communicate With Customer
- Treat Customer Kindly
- Customer Job Site Clean

7. Electrical

- Work hot or deenergized?
- Total line clearance
- Partial clearance (one-shot)
- Deenergize if possible
- Backfeed possible?
- Open neutrals
- Testing voltage properly
- Pickups/pulling load
- Clearance distance required
- Fault current available
- Mechanical jumpers
- Static/Induced voltage
- Energized static conductor
- Insulated static conductor
- Second point of contact

8. Utility Locates

- Verification
- Potholing

9. Low Voltage

- Generators
- Tools
- Cords
- Ground Fault Interrupters

10. Vehicles

- Backing
- Wheel Chocks

11. Traffic Control

- Cones, signs
- Flagman
- Arrow Board
- Safety Vests
- Roadway hazards
- Pedestrians

14. Excavations

- Under 5 feet
- Over 5 feet
- Shored/sloped as needed
- Protective equipment needed
- Competent Person Checklist
- Ladders

15. Confined Spaces

- Atmospheric Hazards
- Permit required
- "Non Permit" required
- Rescue Procedures
- Ladders needed
- Stringing over

16. Wire Stringing

- Stringing adjacent to
- Guarding
- Swivels
- Grips
- Catch offs
- Presses/Dies
- Equipment grounds

17. Grounding (Not grounded, not dead)

- Conductor running grounds
- Line grounds
- Personal grounds
- Equipotential grounds
- Bonding
- Secure the load

18. Hauling

- Overdimension loads
- Adequate load capacity
- Adequate brakes
- Adequate lighting

Incidents: Create New Incident

- Create Incidents (Injury, Near Miss, Property Damage, Investigation Report) keep track off:
 - Incident Type
 - Incident Name/Identifier
 - Date/time: Occurrence
 - Date/time: reported to superior
 - Address Locations
 - Weather conditions

[All Incidents](#) [Export](#)

New Incident at TESST APPA Utility

Incident Type *

- Select -

Incident Name/Identifier *

Date and time of event *

Date

Time

Date and time when the incident occurred

Date and time reported to superior *

Date

Time

Date and time when the incident was reported

Address/Location *

Location where the incident occurred (address or description)

Temperature *

Fahrenheit, in tenths

Precipitation *

inches, in hundredths

Wind Speed *

MPH, in tenths

Other Weather

Create New Incident

Electronic Safety Manual

APPA Safety Manual - 16th Edition

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Type topic or keywords here.

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Downloads

115.5 Job Briefings

American Public Power Association safety resources on job briefings can be found at www.PublicPower.Org/Safety.

1. The employer shall ensure that the employee in charge conducts a job briefing with the employees involved before the start of each job. The job briefing will at least cover the following subjects and is recommended to be documented:
 1. Hazards associated with the job.
 2. Work procedures involved.
 3. Special precautions.
 4. Energy-source controls.
 5. Personal protective equipment (PPE) requirements.
 6. Emergency response information.
2. If the work or operations to be performed during the work day are repetitive and similar, at least one job briefing shall be conducted before the start of the first job of each day or shift. Additional job briefings shall be held if significant changes that might affect the safety of the employees occur during the course of the work. Significant changes such as work tasks or hazards differing, or additional un-briefed personnel arriving to perform work at the jobsite shall be addressed with a job briefing.
3. A brief discussion is satisfactory if the work involved is routine and if the employee, by virtue of training and experience, can reasonably be expected to recognize and avoid the hazards involved in the job. A more extensive discussion shall be conducted if the work is complicated or extremely hazardous, or the employee cannot be expected to recognize and avoid the hazards involved in the job.
4. An employee working alone need not conduct a job briefing. However, the employee shall ensure that the tasks to be performed are planned as if a briefing were required.
5. Refer to OSHA Best Practice: Job Briefings, OSHA Standard 29 CFR 1910.269(c), NFPA 70E 110.1(H) and NESC, ANSI C-2 2017 – Part 4.

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DEED Safety Smart Video Series

- Based on old DEED Safety Videos
- New APPA DEED Program Grant (\$87.7 K to MMUA)
- Filmed at MMUA and ECG
- Shorter in length.

Name	Place	Group
Bangor Municipal Utility	First	A
City Utilities of Richland Center	Third	A
Clintonville Water & Electric Plant	First	A
Columbus Water & Light	First	A
Lodi Municipal Light & Water Utility	First	A
Medford Electric Utility	First	A
Muscoda Utilities	First	A
Rice Lake Utilities	First	A
Shawano Municipal Utilities	First	A
Waupun Utilities	Entrant	A
Whitehall Municipal Electric Utility	First	A
Arcadia Electric Utility	First	B
Black River Falls Municipal Electric & Water Utilities	Entrant	B
Brodhead Water & Light Commission	First	B
Evansville Water & Light Dept.	First	B
New Holstein Utilities	First	B
New Richmond City Utilities	First	B
Oconomowoc Utilities	Entrant	B
Reedsburg Utility Commission	First	B
River Falls Municipal Utilities	Entrant	B
Two Rivers Water & Light	First	B
Waunakee Utilities	Entrant	B
Wisconsin Rapids Water Works & Lighting Commission	Entrant	B
Menasha Utilities	Entrant	C
Stoughton Utilities	Entrant	C
Sturgeon Bay Utilities	First	C
Sun Prairie Utilities	Entrant	C
Kaukauna Utilities	First	D
Marshfield Utilities	Entrant	D
Manitowoc Public Utilities	Entrant	E

Public Power's Research Program



Why DEED?

- ❖ National research program
- ❖ Funding for innovative projects & student interns
- ❖ Pipeline for student assistance & recruitment
- ❖ DEED award recognition (EIA & ACE)
- ❖ Points towards  gnation.
Reliable Public Power Provider
- ❖ Sharing Knowledge/Tech Transfer: reports & resources shared on webinars, DEED Project Database (DPD), monthly newsletter, listserv, and discounted resources in APPA Store

DEED by the Numbers

- **960+** DEED Members
- **63%** of grant proposals approved/10 years
- **Average 2019 grant = \$82,041**
- Results from **622+ projects** available

2019

- \$1.53 M awarded supporting 17 grants & 37 scholarships
- Shared results from 18 Grants & 19 Scholarships completed

Wisconsin activity by the Numbers

- **Members:** 47 DEED members in Wisconsin
- **Funding:** \$733,265 has supported Wisconsin projects and scholarships over the last 40 years.
- **Awards:**
 - **ACE:** WPPI Energy received the ACE Award in 2003.
 - **EIA:** Two Wisconsin utilities earned Energy Innovator Awards; Sturgeon Bay in 1983 and New London in 1995
- **DEED Board Directors:** Two recent DEED directors have been from Wisconsin, Jeff Feldt, Kaukauna Utilities and current board director Mike Noreen, River Falls Municipal Utilities.



Cyber & Physical Preparedness

- Help members develop “all-hazards” approach to disaster preparation and response
- Show federal policymakers public power’s commitment to security and mutual aid
- Strengthen government/industry partnerships
- Minimize new federal regulation

DOE Cooperative Agreement Overview

- In 2016 the Association partnered with the Department of Energy (DOE) on a 3-year, \$7.5M Cooperative Agreement;
- Year 1 – Analysis and Data Collection
- Year 2 – Deployment and Resource Development
- Year 3 – Sustainability

***Acknowledgment:** These activities are based upon work supported by the Department of Energy under Award Number DE-OE0000811.*



Cybersecurity Scorecard

- Use existing cybersecurity models to inform a product that is useable by all public power utilities
- Developed a self-assessment tool called the public power **Cybersecurity Scorecard**
- Usable by small to mid-sized public power utilities to start evaluating their cybersecurity program
- Also scalable where all public power utilities will find it useful
- Complete your assessment today: <https://publicpower.axio.com/>

***Acknowledgment:** These activities are based upon work supported by the Department of Energy under Award Number DE-OE0000811.*

Scorecard Evaluations

Member Metrics as of 01/13/20

- 329 public power utilities participating
 - (2019 Goal was to reach 400 out of the 700 identified targets)
- 694 foundational cybersecurity self-assessments from the 637 users
 - (14 Questions – 45 minutes)
- 174 completed a full C2M2 assessment
 - (312 Questions – 2-3 days)

Wisconsin Cyber Activity

Cyber Summit Attendees

- o Kaukauna Utilities
- o WPPI Energy

Task 1.5 Exercises (24)

- o Arcadia Electric Utility
- o Bangor Municipal Utility
- o Black River Falls Municipal Electric
- o Boscobel Municipal Utilities
- o Brodhead Water and Light
- o Cedarburg Light and Water Utility
- o City Utilities of Richland Center
- o Eagle River Light and Water
- o Florence Utilities Commission
- o Hartford Electric
- o Juneau Utilities
- o Lodi Municipal Light and Water
- o Menasha Utilities
- o Sun Prairie Utilities
- o Waunakee Utilities
- o WPPI Energy
- o MEUW
- o Muscoda Utilities

- o New London Electric & Water
- o Oconomowoc Utilities
- o Plymouth Utilities
- o Rice Lake Utilities
- o River Falls Municipal Utilities
- o Stoughton Utilities
- o Sturgeon Bay Utilities

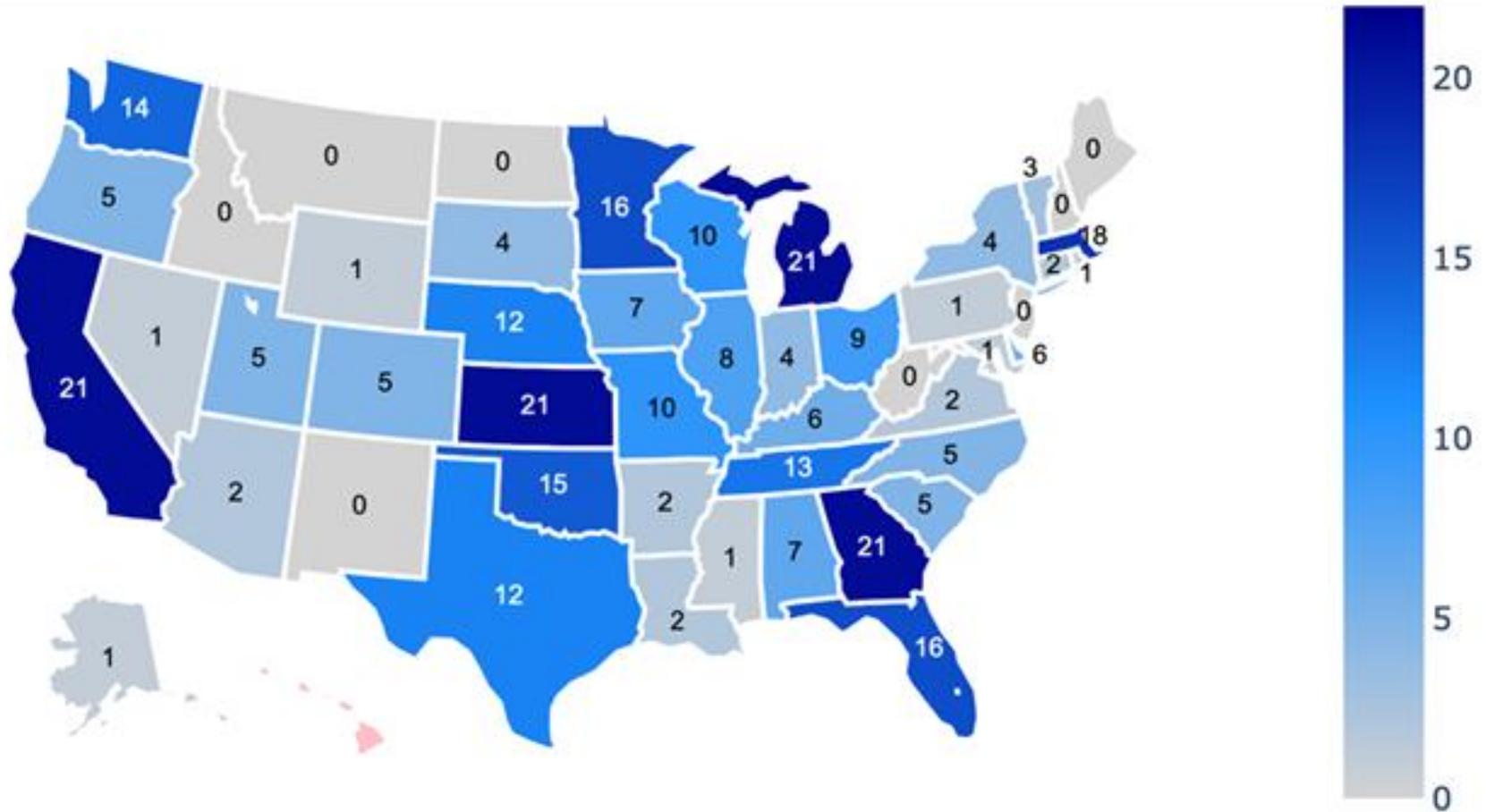
eRT subsidies through CEDS

- o Jefferson Utilities
- o Florence Utility Commission
- o New Richmond City Utilities
- o Waunakee Utilities

Security listserv members (Weekly Situation Report recipients)

- o Manitowoc Public Utilities
- o Plymouth Utilities
- o Rice Lake Utilities
- o WPPI Energy
- GridEx Outreach
- o Manitowoc Public Utilities
- o WPPI Energy

Wisconsin has had 10 utilities complete the scorecard





Overview of Mutual Aid Process and Available Resources

This material is based upon work supported by the Department of Energy under award number DE-OE0000757.

#PublicPower www.PublicPower.org

About APPA's Mutual Aid Network

- Public power utilities have engaged in mutual aid for over 100 years, primarily through local, state and regional efforts
- Late 90's: Created a one-page mutual aid agreement developed by APPA and National Rural Electric Cooperative Association (NRECA)
- Approximately 2,000 municipal and cooperative utilities have signed it from across the country
- Not designed for extensive mutual aid contracting



Public Power's MAP

Mutual Aid Playbook

*A Guide to Response and Recovery
for the Nation's Public Power Utilities*



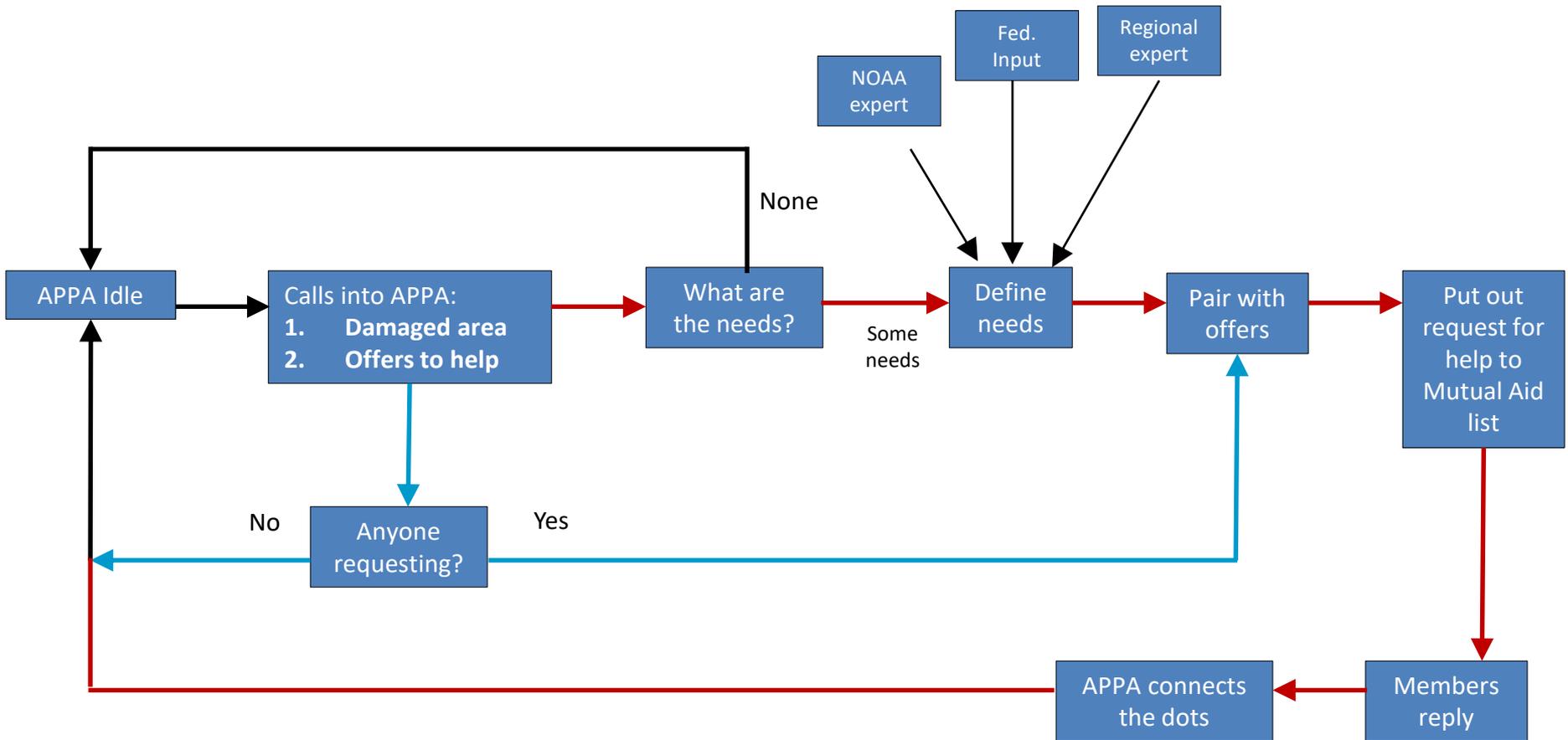
July 2014

APPA® American
Public Power
Association

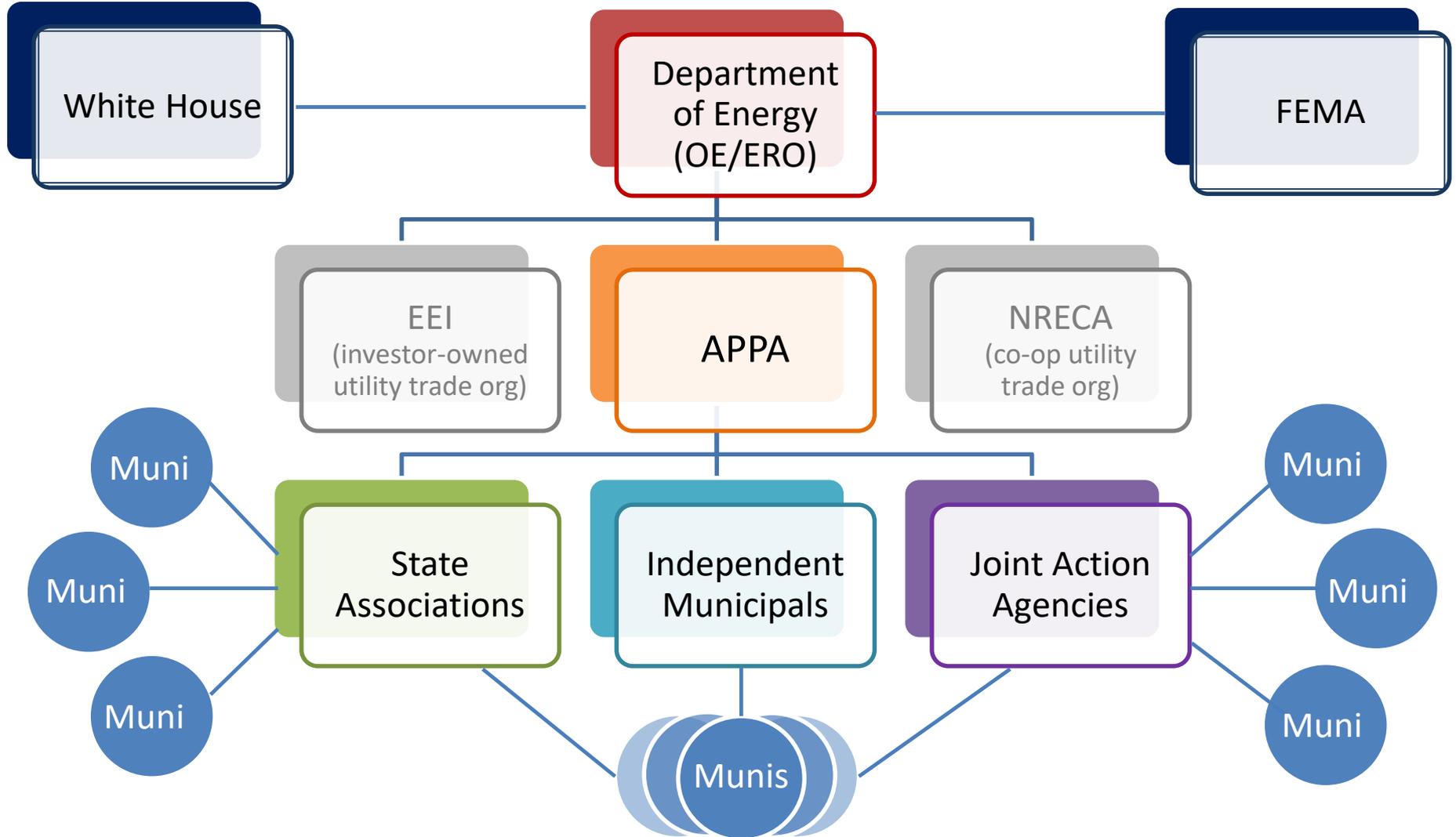
#PublicPower www.PublicPower.org

Public
Power's
Mutual Aid
Network:
A playbook for
response.

The Network That Was



Public Power's National Challenge



Formalizing Public Power's Mutual Aid Processes

APPA/NRECA
Mutual Aid
Agreement
developed

1999

Post-Sandy
Hotwash with
DOE and DHS

Jan.
2013

Mutual Aid
"Committee of the
Willing" formed

June
2013

Oct.
2012

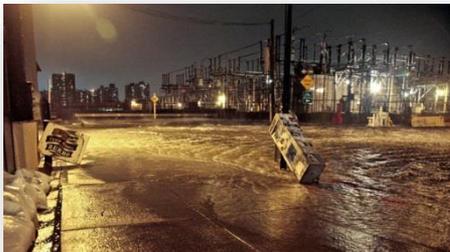
Superstorm
Sandy Hits

May
2013

Gap analysis
conducted,
Meeting with
President Obama

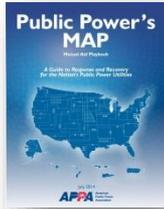
Sept.
2013

First meeting
of Mutual Aid
Working Group
(MAWG)



Formalizing Public Power's Mutual Aid Processes

Mutual Aid Plan Framework developed



Mutual Aid Playbook developed; presented to U.S. DOE Sec. of Energy

Mutual Aid Playbook presented to new Deputy Sec. of Energy, Sherwood-Randall

Jan.
2014

Sept.
2014

April
2015

May
2014

Oct.
2014

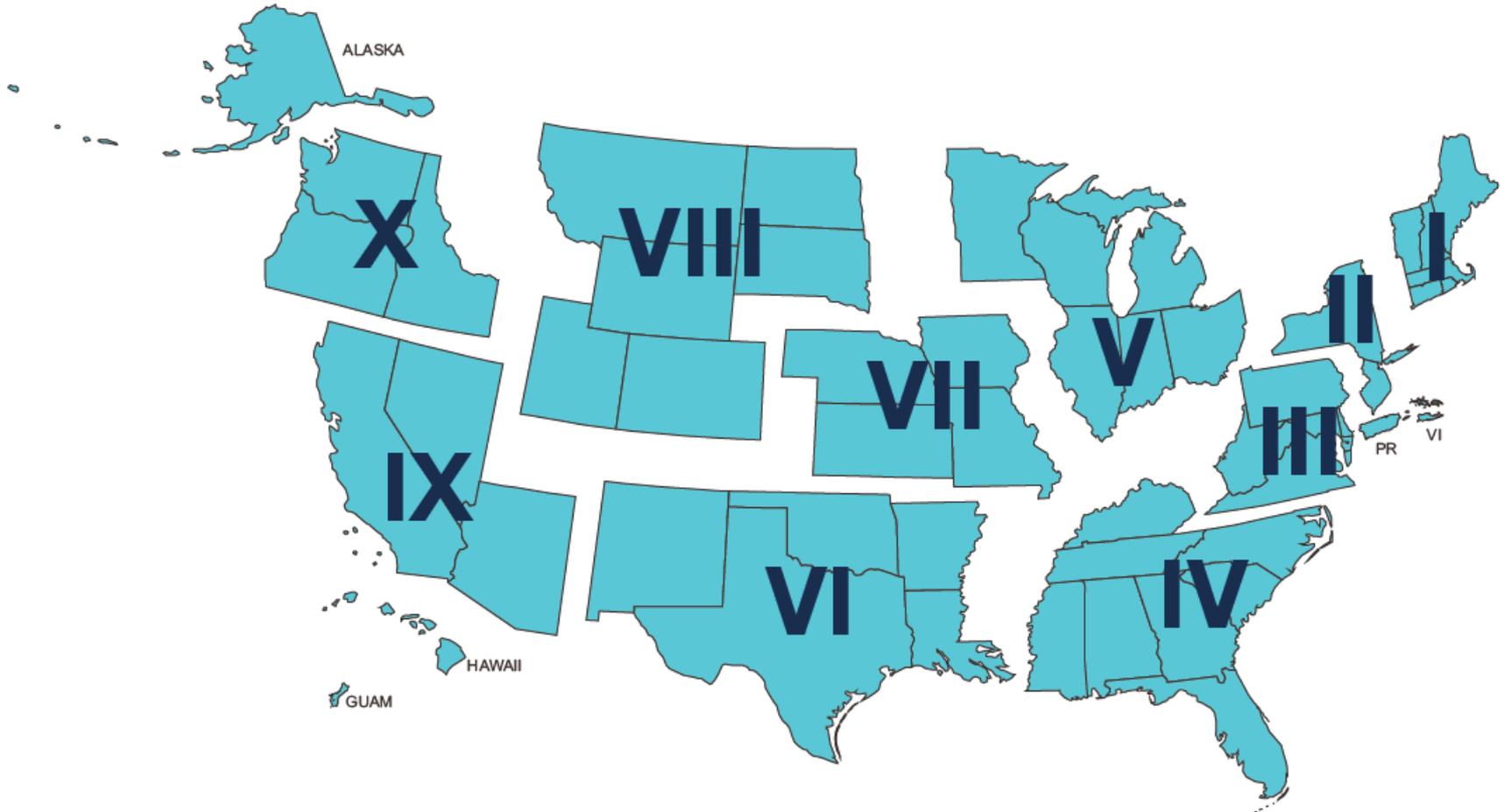
Fall
2015

Public Power's Mutual Aid Network at DOE's Clear Path II event

MAWG Committees formed

- Identify gaps and continue to refine
- Coordination with industry and gov't partners
- Media relations education
- Exercise

2.1 Mutual Aid Network Regions*



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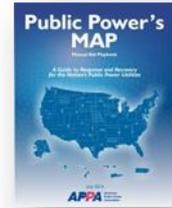
This material is based upon work supported by the Department of Energy under award number DE-OE0000757.

Level	Tier 1: Utility Coordinator	Tier 2: Network Coordinator	Tier 3: National Coordinator (American Public Power Association)
Steady State			
0 No outages	<ul style="list-style-type: none"> Update contact and resources lists and communicate periodically with network coordinator 	<ul style="list-style-type: none"> Compile contact and resources lists from utilities within network 	<ul style="list-style-type: none"> Maintain mutual aid playbook and listserv
1 Isolated event	<ul style="list-style-type: none"> Assess need, respond to event, and determine if escalation is needed 	<ul style="list-style-type: none"> None generally, but may assist with information as requested 	<ul style="list-style-type: none"> Maintain mutual aid playbook and listserv
Local/State Mutual Aid Activated			
2 Local/state event	<ul style="list-style-type: none"> Communicate needs and available resources to network coordinator and update periodically Manage response within their utility 	<ul style="list-style-type: none"> Monitor response May assist identifying available resources Inform APPA of response, potential needs, and if preemptive call is needed 	<ul style="list-style-type: none"> Monitor conditions for possible escalation Monitor response to inform federal agencies
Regional Mutual Aid Activated			
3 Regional event	<ul style="list-style-type: none"> Communicate needs and available resources to network coordinator Periodic updates of needs and resources as response proceeds 	<ul style="list-style-type: none"> Assist identification of available resources May work with other network coordinators to mobilize needed resources 	<ul style="list-style-type: none"> Host preemptive call with affected network coordinators Monitor response to inform federal agencies
National Mutual Aid Activated			
4 National event	<ul style="list-style-type: none"> Communicate needs and available resources to network coordinator Multiple daily updates of needs and resources as response proceeds Manage local response 	<ul style="list-style-type: none"> Assist identification of available resources Work with other network coordinators and APPA to mobilize needed resources 	<ul style="list-style-type: none"> Available to coordinate response Inform federal agencies

Page 9

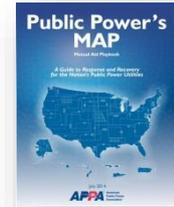
This material is based upon work supported by the Department of Energy under award number DE-OE0000757.

Steady State/Isolated Event



Level	Tier 1: Utility Coordinator	Tier 2: Network Coordinator	Tier 3: National Coordinator <i>(American Public Power Association)</i>
Steady State			
0 No outages	<ul style="list-style-type: none"> Update contact and resources lists and communicate periodically with network coordinator 	<ul style="list-style-type: none"> Compile contact and resources lists from utilities within network 	<ul style="list-style-type: none"> Maintain mutual aid playbook and listserv
1 Isolated event	<ul style="list-style-type: none"> Assess need, respond to event, and determine if escalation is needed 	<ul style="list-style-type: none"> None generally, but may assist with information as requested 	<ul style="list-style-type: none"> Maintain mutual aid playbook and listserv

Local/State Event



Level

**Tier 1:
Utility Coordinator**

**Tier 2:
Network Coordinator**

**Tier 3:
National Coordinator**
(American Public Power Association)

Local/State Mutual Aid Activated

2

Local/state event

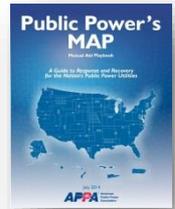
- Communicate needs and available resources to network coordinator and update periodically
- Manage response within their utility

- Monitor response
- May assist identifying available resources
- Inform APPA of response, potential needs, and if preemptive call is needed

- Monitor conditions for possible escalation
- Monitor response to inform federal agencies



Regional Event



Level

**Tier 1:
Utility Coordinator**

**Tier 2:
Network Coordinator**

**Tier 3:
National Coordinator**
(American Public Power Association)

Regional Mutual Aid Activated

3

Regional
event

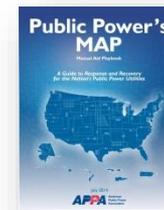
- Communicate needs and available resources to network coordinator
- Periodic updates of needs and resources as response proceeds

- Assist identification of available resources
- May work with other network coordinators to mobilize needed resources

- Host preemptive call with affected network coordinators
- Monitor response to inform federal agencies



National Event



Level

**Tier 1:
Utility Coordinator**

**Tier 2:
Network Coordinator**

**Tier 3:
National Coordinator**
(American Public Power Association)

National Mutual Aid Activated

4

National event

- Communicate needs and available resources to network coordinator
- Multiple daily updates of needs and resources as response proceeds
- Manage local response

- Assist identification of available resources
- Work with other network coordinators and APPA to mobilize needed resources

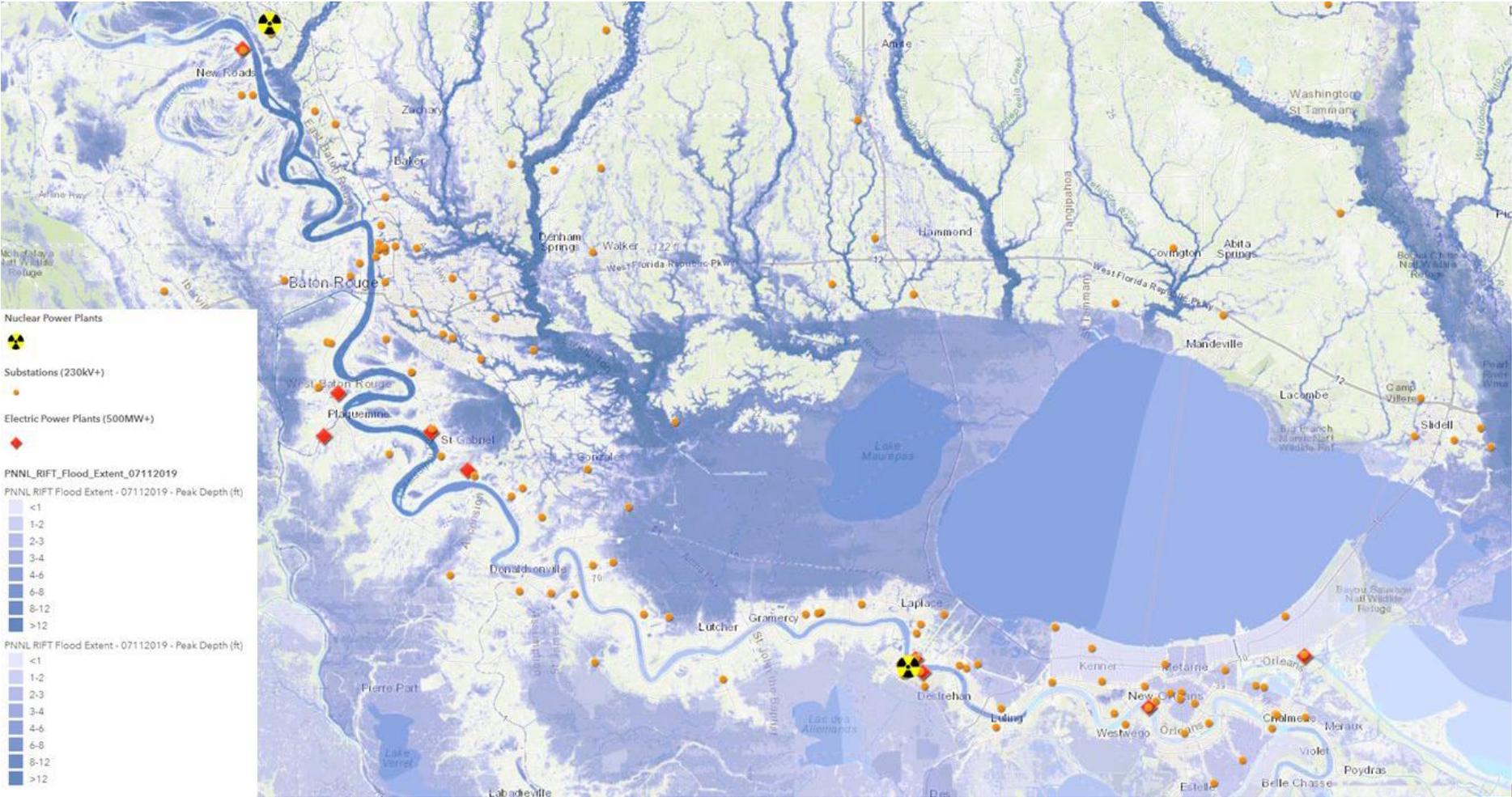
- Available to coordinate response
- Inform federal agencies



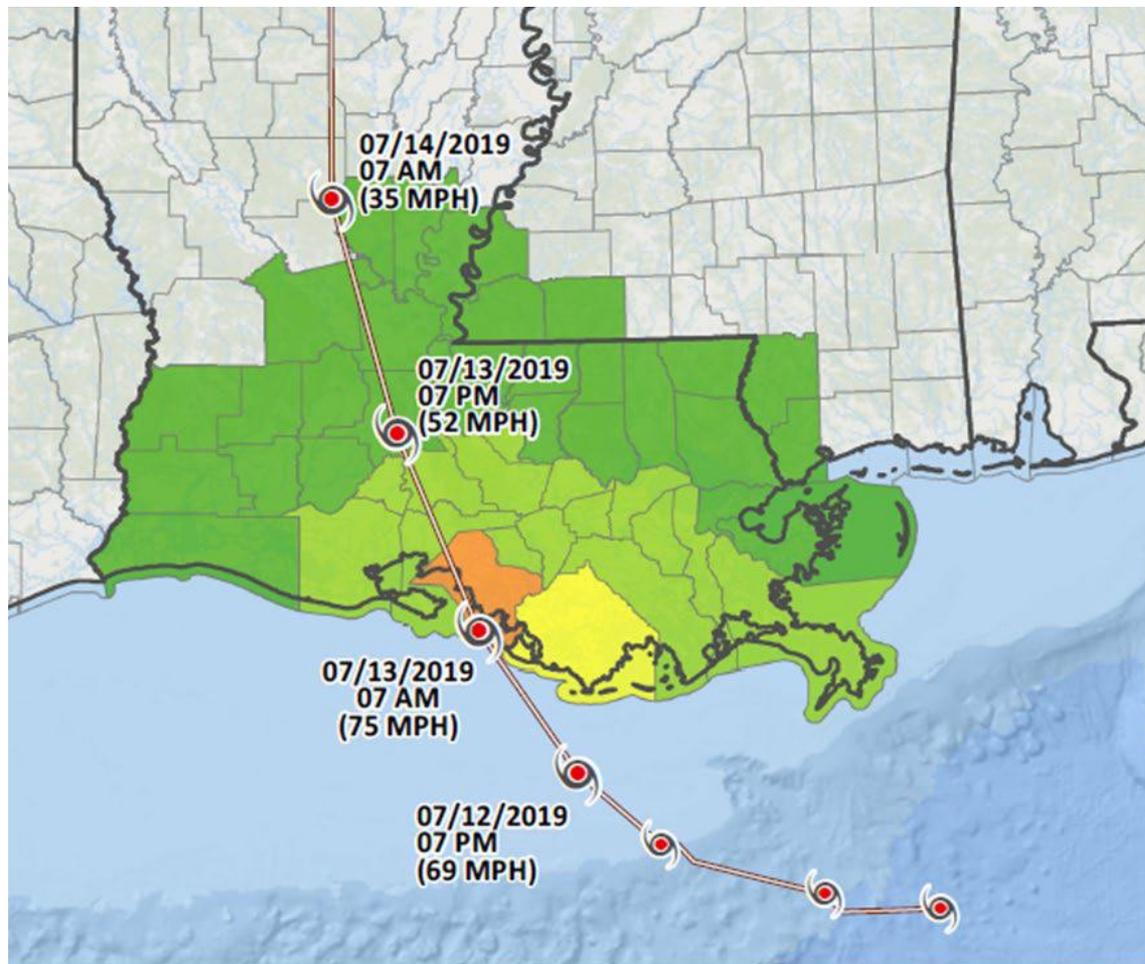
The Battle Rhythm....

- 9:30 AM APPA Mutual Aid Network conference call
 - 10:30 AM DOE/Industry “Unity of Effort” call
 - 12:30 PM FEMA VTC – All ESF’s call w/White House
 - 1:30 PM DOE/Industry “Unity of Messaging” call
 - 2:00 PM NBEOC call – now ESF 14
 - 3:00 PM Cross Sector Coord Council Call
 - 5:30 – 6:00 PM ish DOE Secretary / Industry CEO call
- 

Hurricane Barry: PNNL Flood Model For Official Use Only



Electrical Outage Estimates – ANL FOUO



Forecasted Position

Percentage of Electrical Outages by County



Forecasted Track

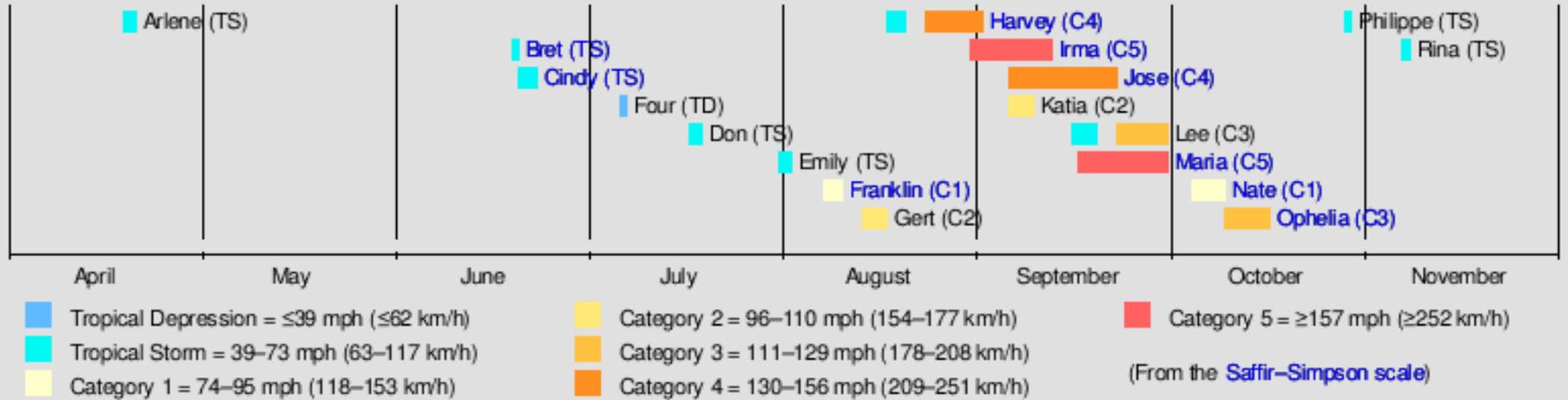
**Total Estimated Customers Impact:
253,915 Electrical Customers**

Results based on fragility curve:
Hurricane Fragility Curve, (2015)
Argonne National Laboratory.

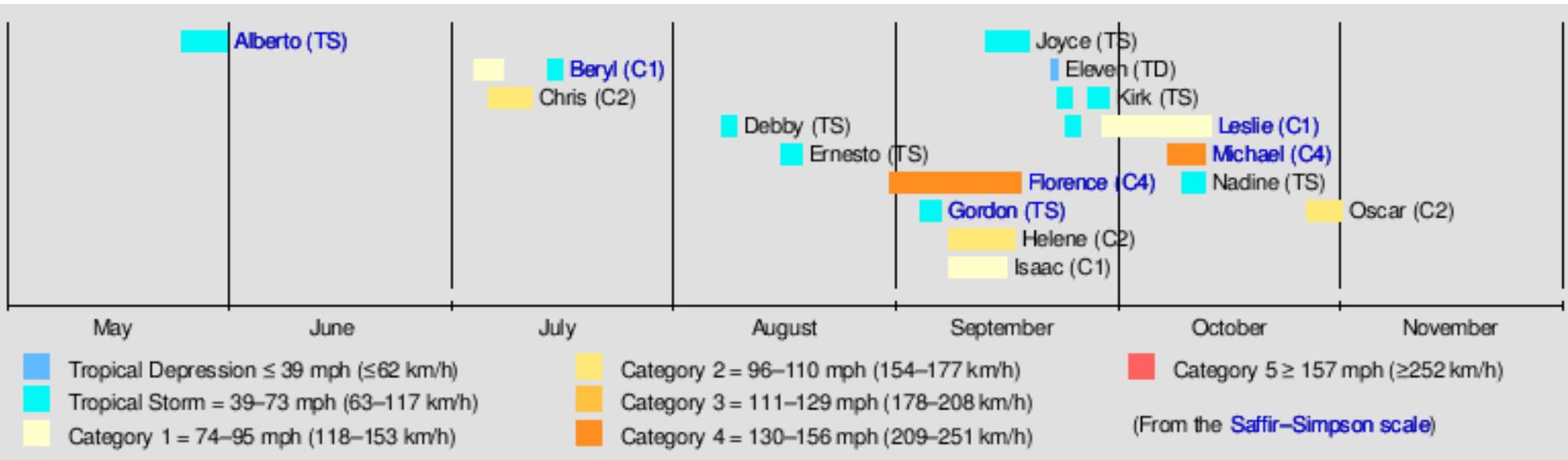
*Considers impacts resulting from sustained wind speeds of 39 mph or greater.

*The estimated number of electric customer outages does not reflect any potential restoration efforts that may occur.

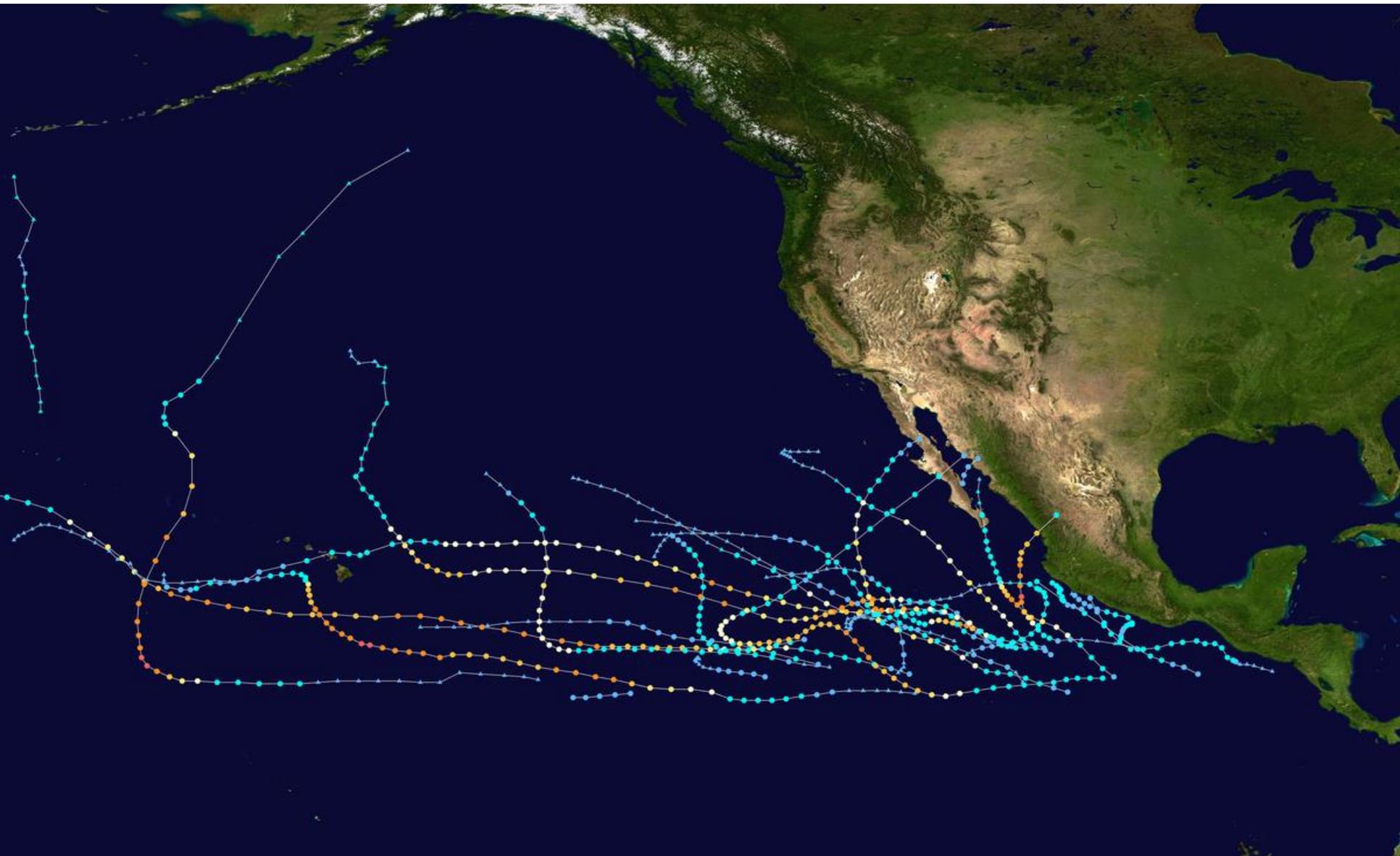
2017 Storm Season Timeline (Hurricanes)



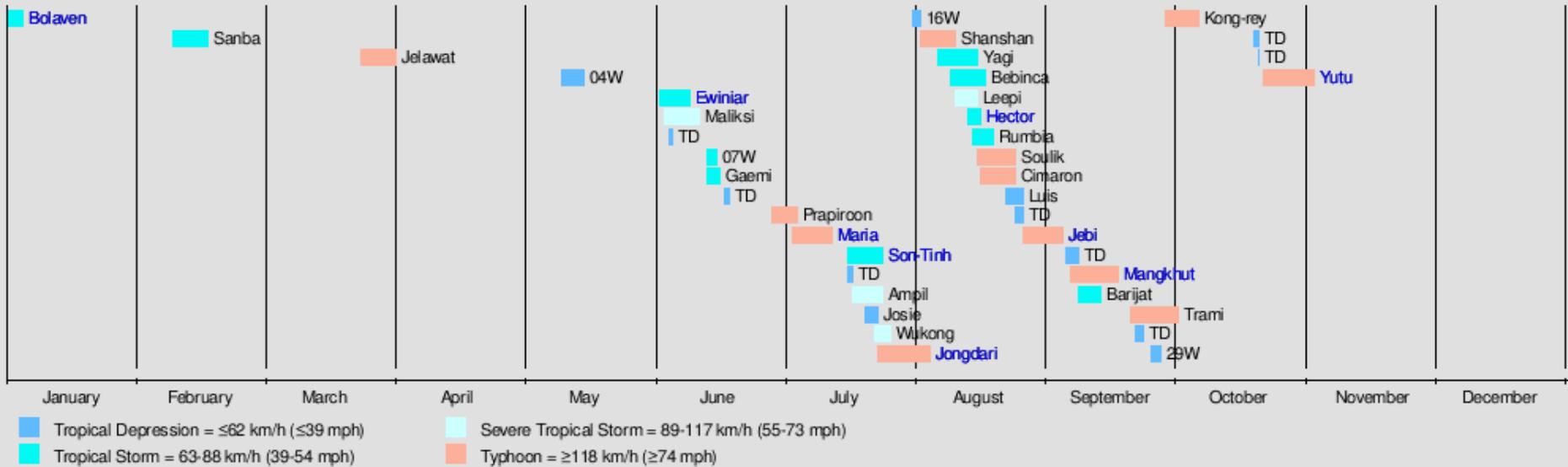
2018 Storm Season Timeline (Hurricanes)



2018 Storm Season Timeline (Typhoons)

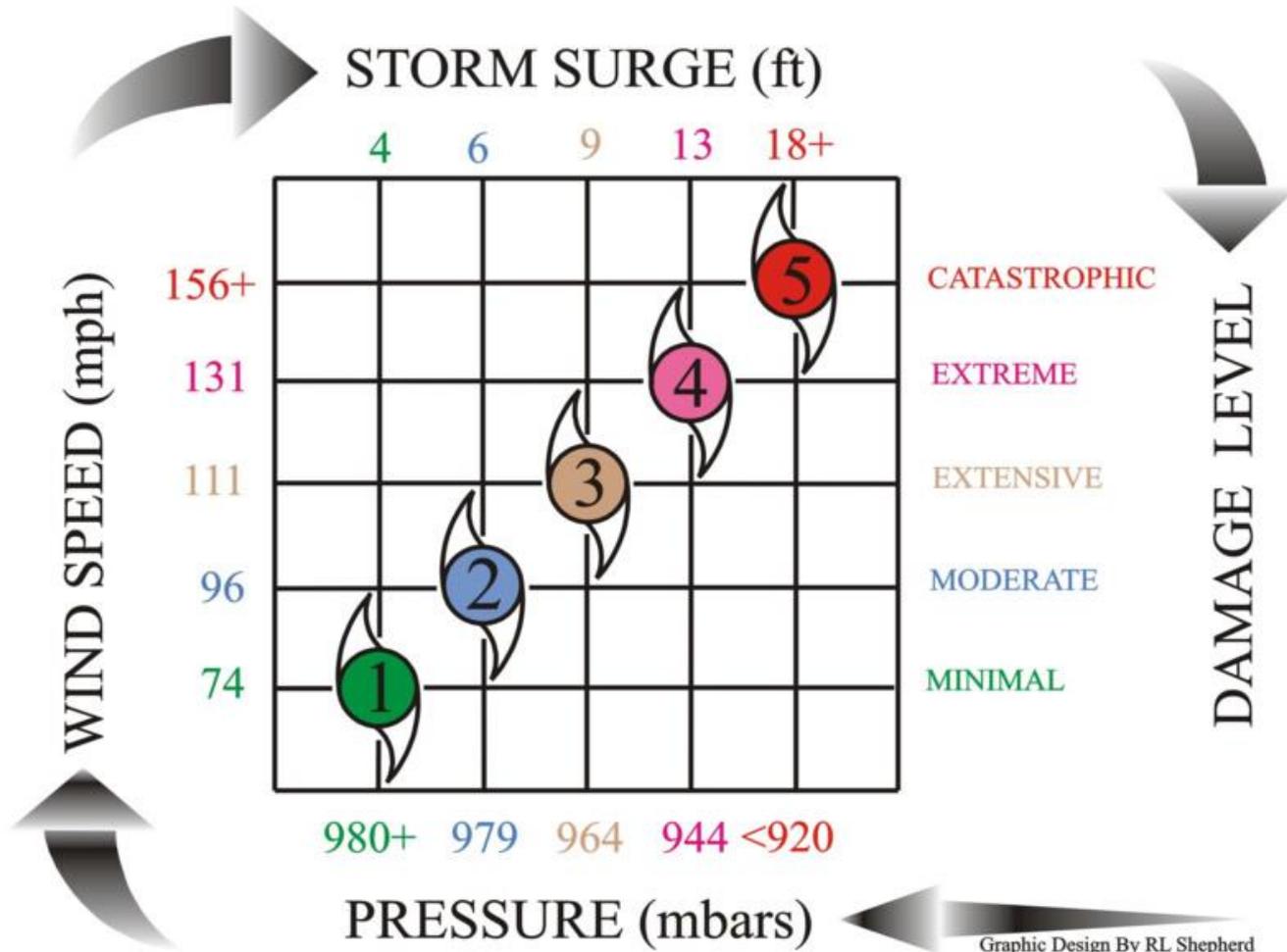


2018 Storm Season Timeline (Typhoons)



Hurricanes Strength

SAFFIR-SIMPSON HURRICANE SCALE

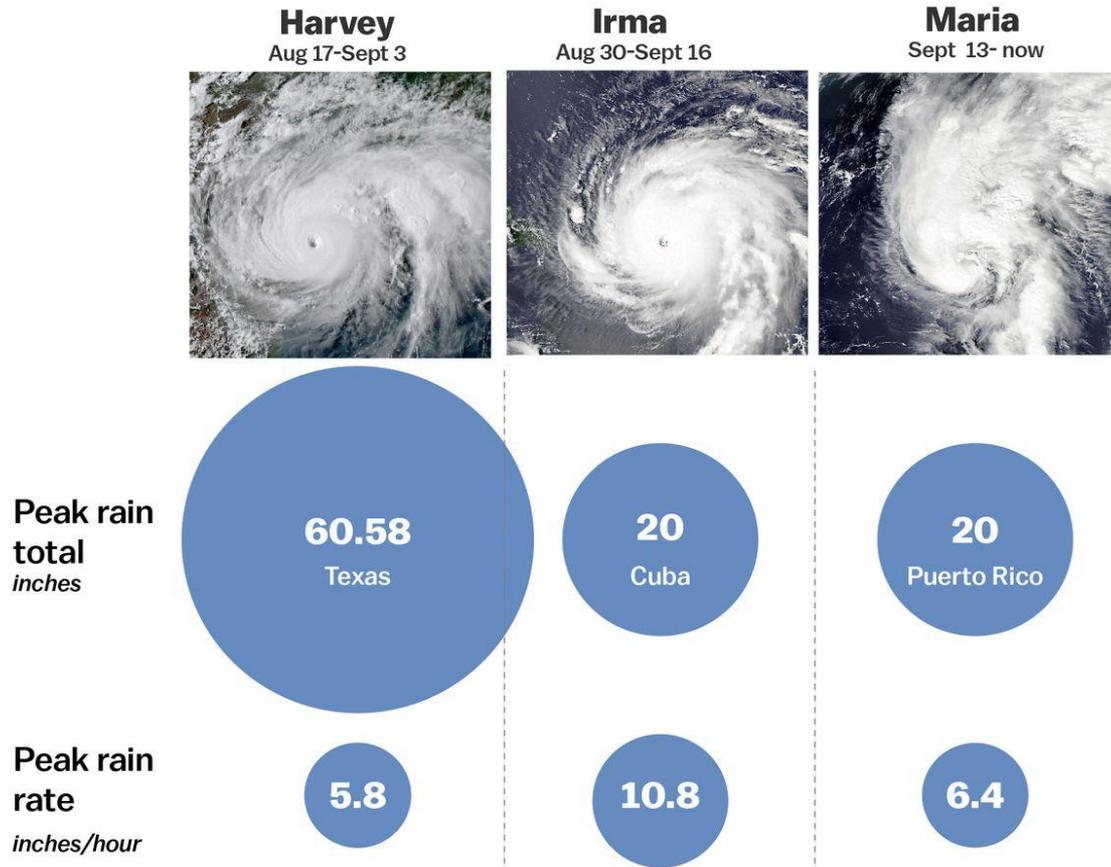


Storm Season Timeline



Storm Season Comparison: Harvey = Water

How the recent storms compare



SOURCE: NOAA, NASA

Vox

Harvey



Harvey

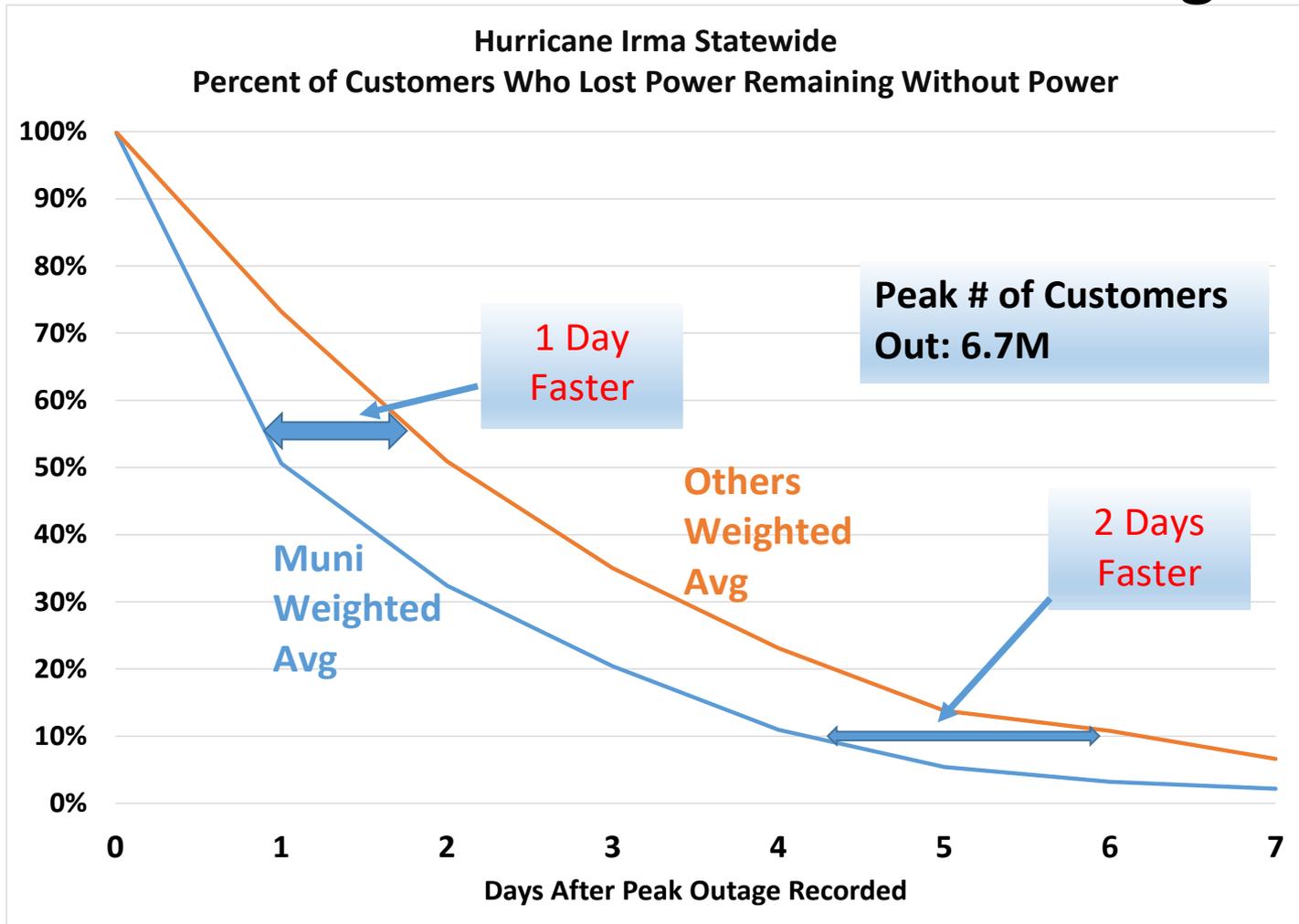


Storm Season Comparison: Irma & Maria = High Winds (Cat 5 on SS Scale)

Highest 1 minute sustained winds (175 mph or greater)
Source: <http://bit.ly/2AkUySt>

Rank	Hurricane	Season	Winds	
			mph	km/h
1	Allen	1980	190	305
2	"Labor Day"	1935	185	295
	Gilbert	1988	185	295
	Wilma	2005	185	295
	Irma	2017	185	295
6	Mitch	1998	180	285
	Rita	2005	180	285
8	"Cuba"	1932	175	280
	Janet	1955	175	280
	Carla	1961	175	280
	Camille	1969	175	280
	Anita	1977	175	280
	David	1979	175	280
	Andrew	1992	175	280
	Katrina	2005	175	280
	Dean	2007	175	280
	Felix	2007	175	280
	Maria	2017	175	280

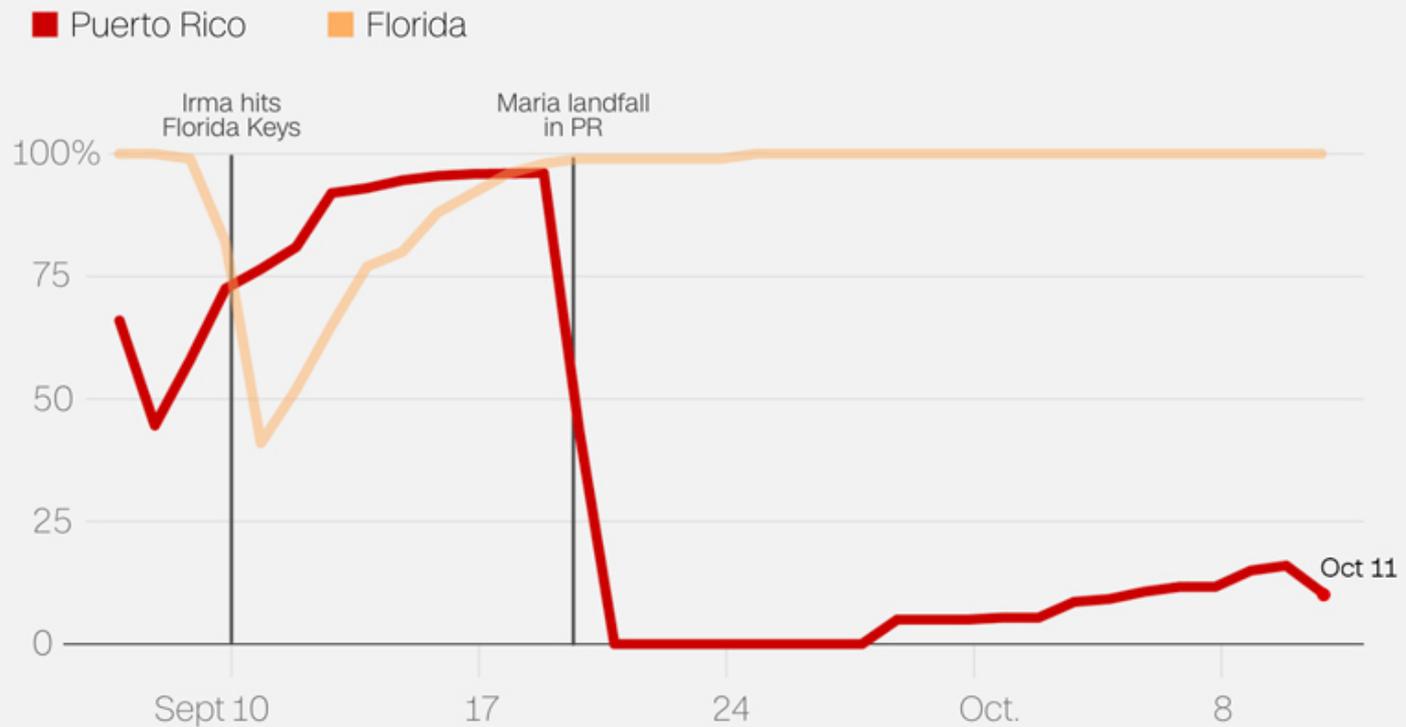
For CONUS storms, we model for typical restoration of service ... and muni's look good!



Not so easy on Island time...

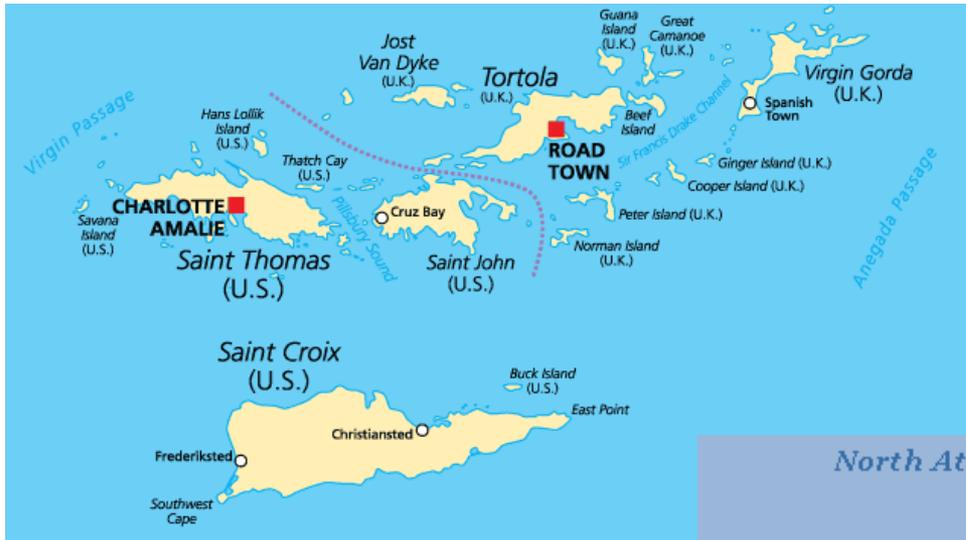
Percent of customers with electricity after Irma and Maria

Puerto Rico's electricity recovery is stuck



Source: DOE, Status.pr

Why was USVI/Puerto Rico/CNMI/ASPA Different?



Mutual Aid – what we do best...but we can't drive to the Islands....

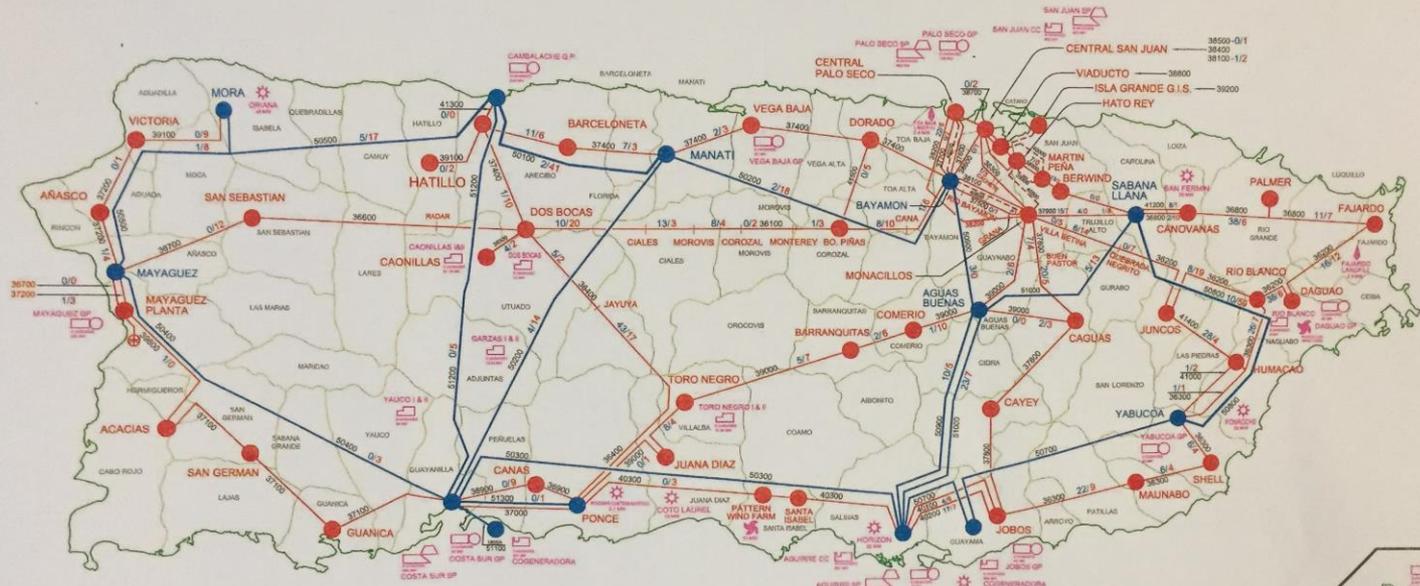


Transportation/shipping issues...



Puerto Rico Electric Power Authority Electric System Operation Division Transmission Lines 115 kV - 230 kV

STRUCTURES DAMAGED → ## ← CONDUCTOR INSULATION OHGW } CONDITIONS



LEGEND:

- 230 KV TRANSMISSION LINES
- 115 KV TRANSMISSION LINES
- - - 115 KV TRANSMISSION LINES- UNDERGROUND
- 230 KV TRANSMISSION CENTER
- 115 KV TRANSMISSION CENTER

- | | | | |
|---------------------|---------------------|----------------|--------------|
| TERMoeLECTRIC PLANT | HIDEoeLECTRIC PLANT | BATTERY SYSTEM | SOLAR FARM |
| COMPRESSED CYCLE | GAS TURBINE | WIND FARM | LANDFILL GAS |



REVISION: SEPTEMBER 30 2017- 10:00 PM

IMT Team Assignments

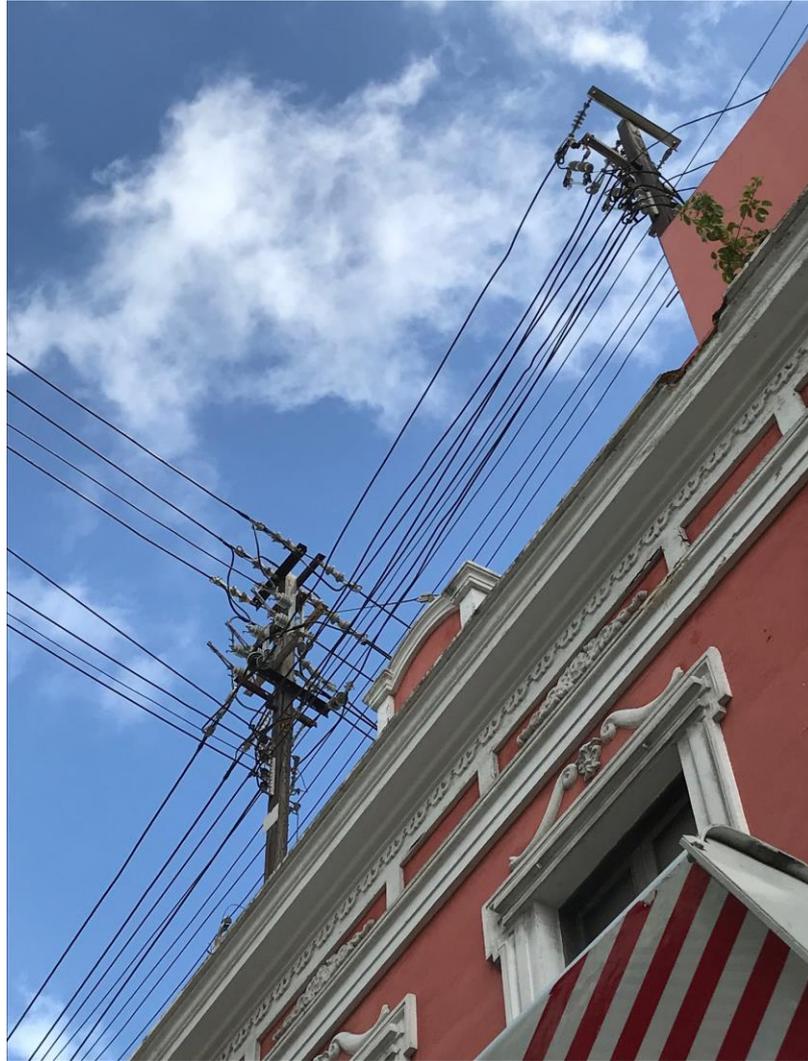


Above logos correspond to regional IMT organization

Roof Top Pole Lines?







Aging equipment.....





Vegetation
Management...?

Guying?

Pole Depth..?

Service drop.....



Renewable Generation?





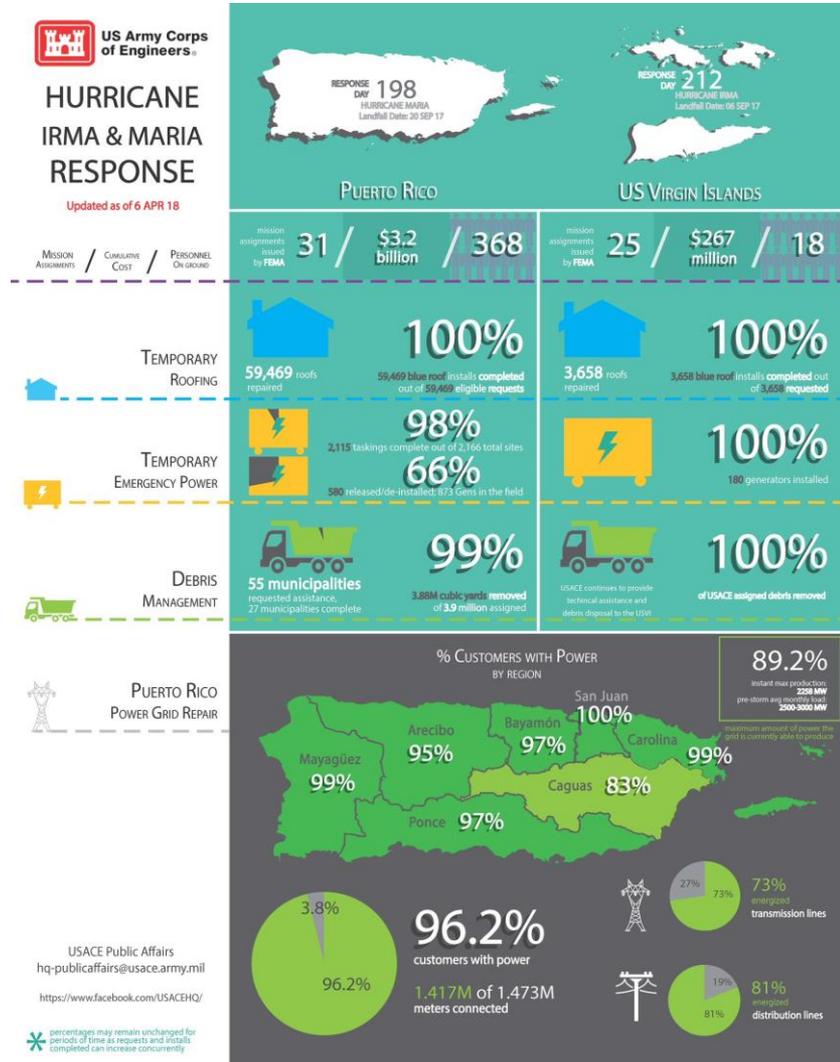
Lets try Wind?

Naguabo, PR (Getty Images)



Spot generation... Microgrids...

7 Mil/Day in fuel alone.....



Is there an easy fix?

- Pre-storm condition of assets matters...
 - Vegetation
 - Maintenance (including vehicles)
 - Construction (ex pole depth.....)
 - Supply of materials
- Adherence to standards
 - Codes.....and other best practices.
- Need for collaboration
 - Mutual Aid...
 - Agreements in advance of storm
 - Better / more robust Mutual Aid agreements.....
 - Conferences/education
- Sharing of Best Practices
 - FEMA ICS
 - Restoration leading practices

April – 2018 Rightsizing the workforce on Puerto Rico

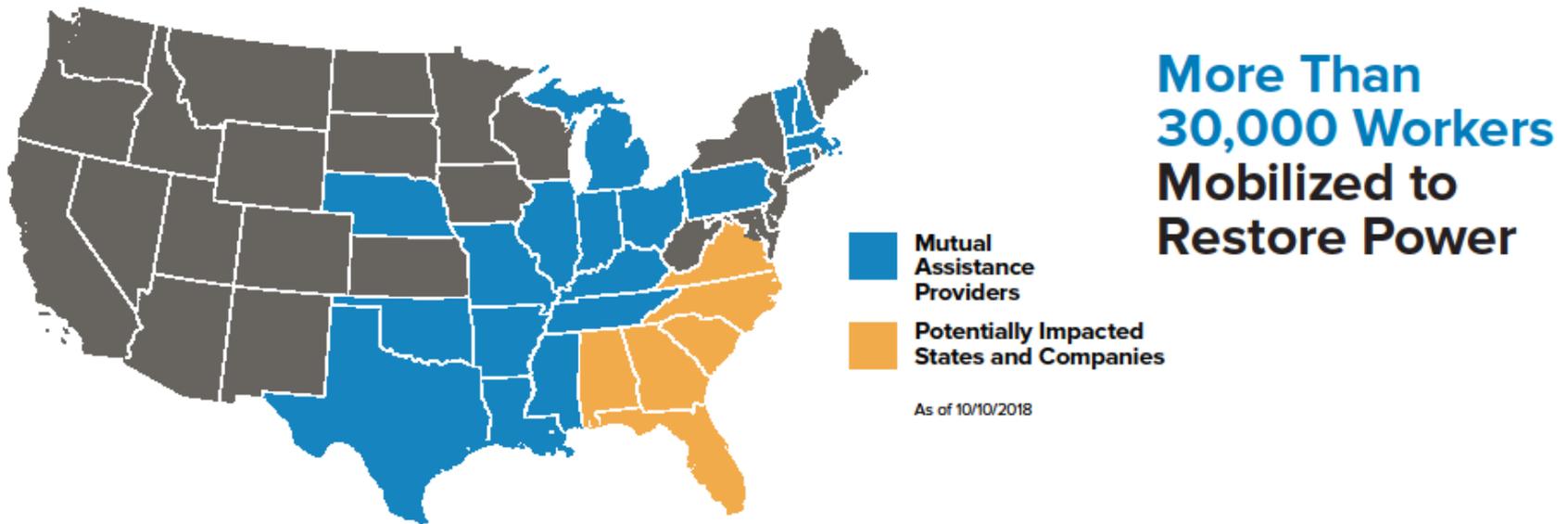


2018 Storm Season

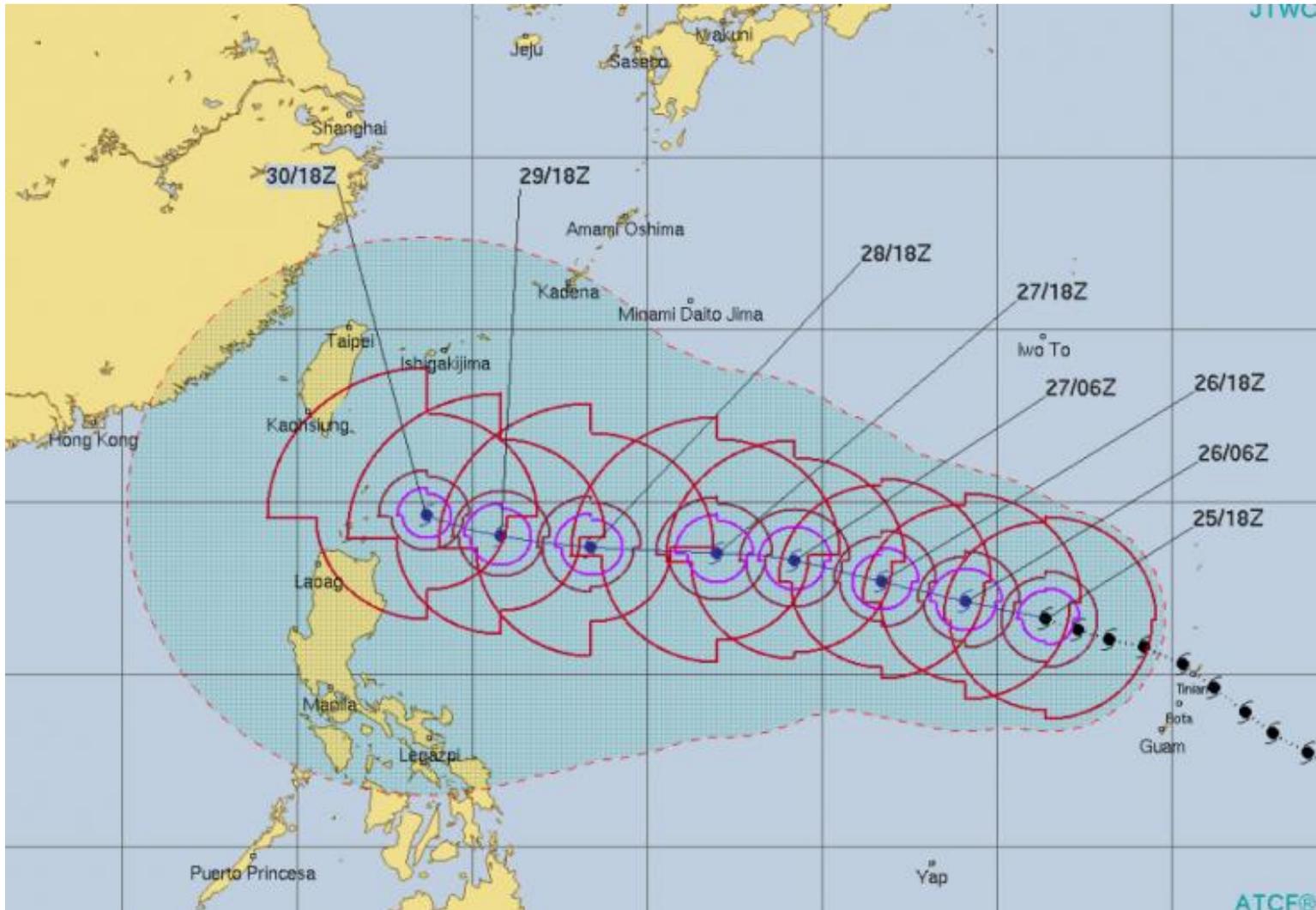
- Hurricane Florence
- Hurricane Michael
- Typhoon MangKhut
- Typhoon Yutu

2018 – Marketing of “Unity of Effort” across the electric industry

Hurricane Michael: **Mutual Assistance Is A Hallmark Of The Electric Power Industry**



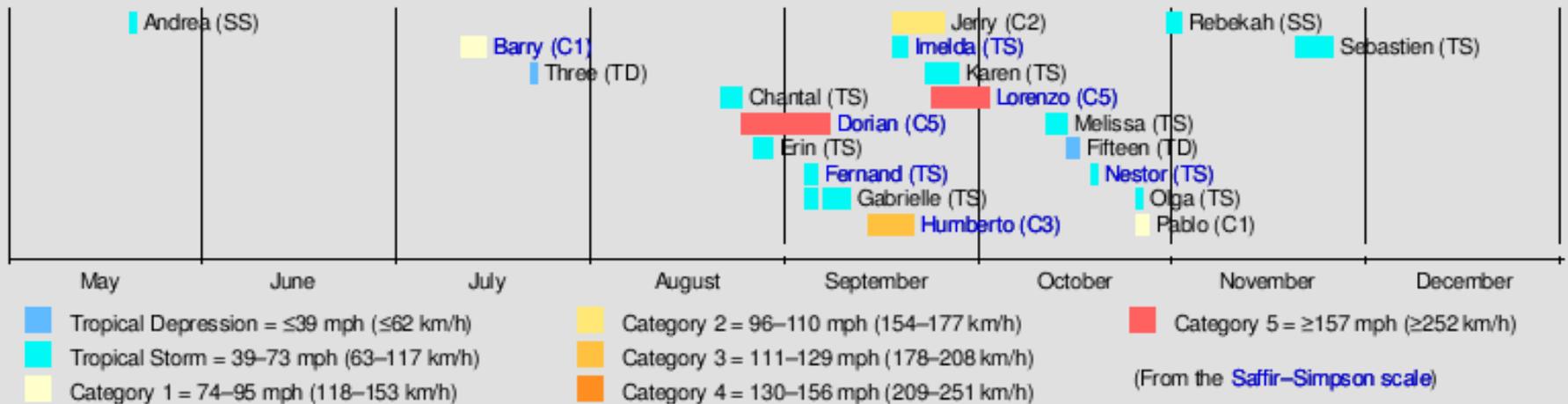
Typhoon Yutu



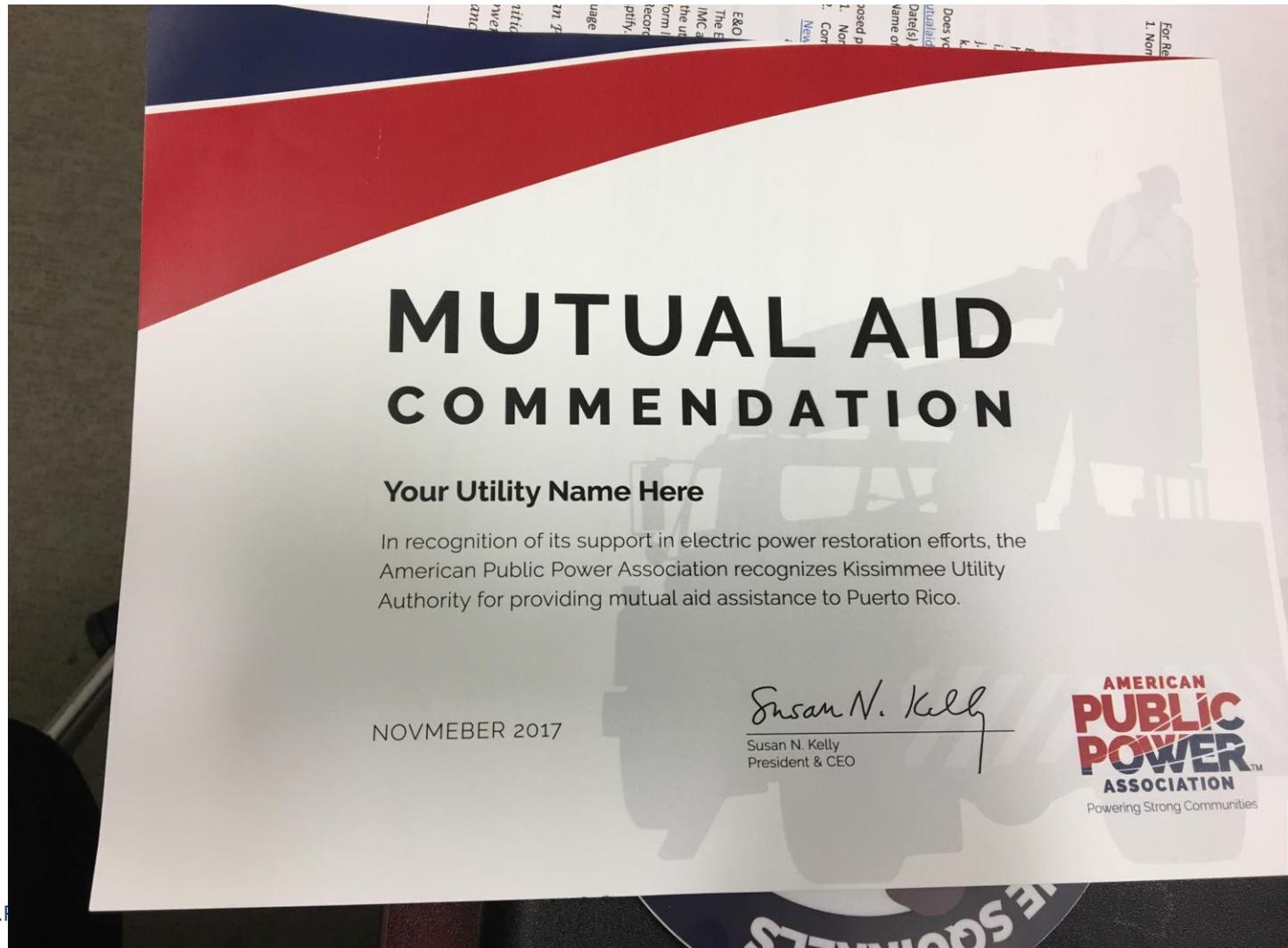
Typhoon Yutu



2019 Hurricane Timeline... a bit more quiet.



New Last Year: Mutual Aid Commendation
Handed out over 360 to date!.....



Wisconsin Activity

Mutual Aid Agreement	Utility that received aid	Date Mutual Aid Received
Manitowoc Public Utilities	Waupun Utilities	Aug-18
Manitowoc Public Utilities	New Holstein Utilities	Aug-18
Manitowoc Public Utilities	Kiel Utilities	Aug-18
Marshfield Utilities	Kissimmee Utility Authority	Sep-17
Marshfield Utilities	Virgin Islands Water & Power	Dec-17 - Feb-18
New London Electric & Water	Mount Pleasant Utilities	Aug-18
Reedsburg Utility Commission	Virgin Islands Water & Power	Dec-17 to Jan-18
Reedsburg Utility Commission	Kissimmee Utility authority	Sep-17
Rice Lake Utilities	Barron Electric Co-op	May-17
Rice Lake Utilities	Virgin Islands Water & Power	Dec-17 to Feb-18

Additional Resources

- **Emergency Preparedness Tabletop Exercise-in-a-Box**
- **Storm Communications Toolkit**
- **FEMA Public Assistance & Hazard Mitigation Grant Programs Toolkit**
- **Restoration Best Practices Guidebook**
- **All-Hazards Guidebook**
- **National MAWG Exercises - Yearly**

AMERICAN
PUBLIC
POWER
ASSOCIATION





#LightUpNavajo

- 15,000 families without electricity
- (75% of US families with out access to electricity)
- 280,000+ Square mile territory
- <\$12,000 median income

Thank You! 2019 Light Up Navajo Volunteers

City of Milford (DE)

City of Santa Clara (UT)

City of Scottsburg (IN)

City of St George (UT)

City of Wadsworth (OH)

Conway Corporation (AR)

Delaware Municipal Electric Corp (DE)

Farmington Electric Utility System (NM)

Grand River Dam Authority (OK)

Greenville Electric Utility System (TX)

Heber Light & Power (UT)

Lawrenceburg Municipal Utilities (IN)

Lehi City Power (UT)

Littleton Light Department (MA)

Murray City Power (UT)

Painesville Electric Department (OH)

Paxton Municipal Light Department (MA)

Piqua Power System (OH)

Rochelle Municipal Utilities (IL)

Sacramento Municipal Utility District (CA)

Salt River Project (AZ)

Sterling Municipal Light Department (MA)

Town of Smyrna (DE)

Washington City Power (UT)

West Boylston Municipal Light Plant (MA)



Light Up Navajo Stats

25 public power organizations

120+ volunteers

50+ miles of line built

\$272,360 donated

\$440,500 volunteer linework

233 families connected



SMART ENERGY PROVIDER

American Public Power Association

2019 Release

■ INTRODUCTION TO SMART ENERGY USE

APPA recognizes that each utility has a unique set of characteristics, and that size, geographic region, and other factors play a significant role in determining the best path for utilities navigating the sea change in the electric utility industry.

■ APPA Members

- Looking for national initiatives
- Desire for strong and practical program
- Difficult to audit

■ APPA

- Provides path and recognition for member efforts in -- energy efficiency, clean energy, and sustainability
- Help with initiatives at federal agencies

■ SEP PROGRAM OVERVIEW

What is the Smart Energy Provider (SEP) program?

“a best practices designation for the ‘greener’ side of utility operations”

1

National recognition of utility efforts and commitment to incorporating energy efficiency and sustainability while providing reliable electric service

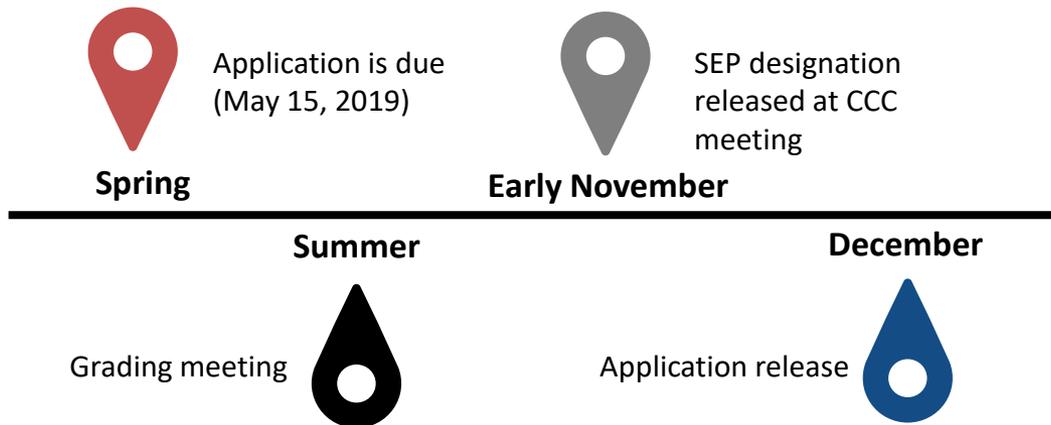
2

Help public power utilities benchmark their work in this area against others in the industry

3

Provide a vehicle for peer evaluation based on a set of industry best practices

■ SEP APPLICATION OVERVIEW



- **SEP Review Panel**
Conducts application reviews
- **Designation**
Two years period
Pass/fail system
(>70 points receive designation)

■ APPLICATION DISCIPLINES



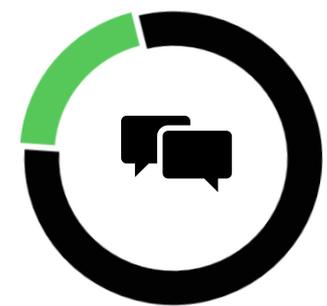
Smart
Energy
Information
(20%)



Energy Efficiency &
Distributed Energy
Resources (37%)



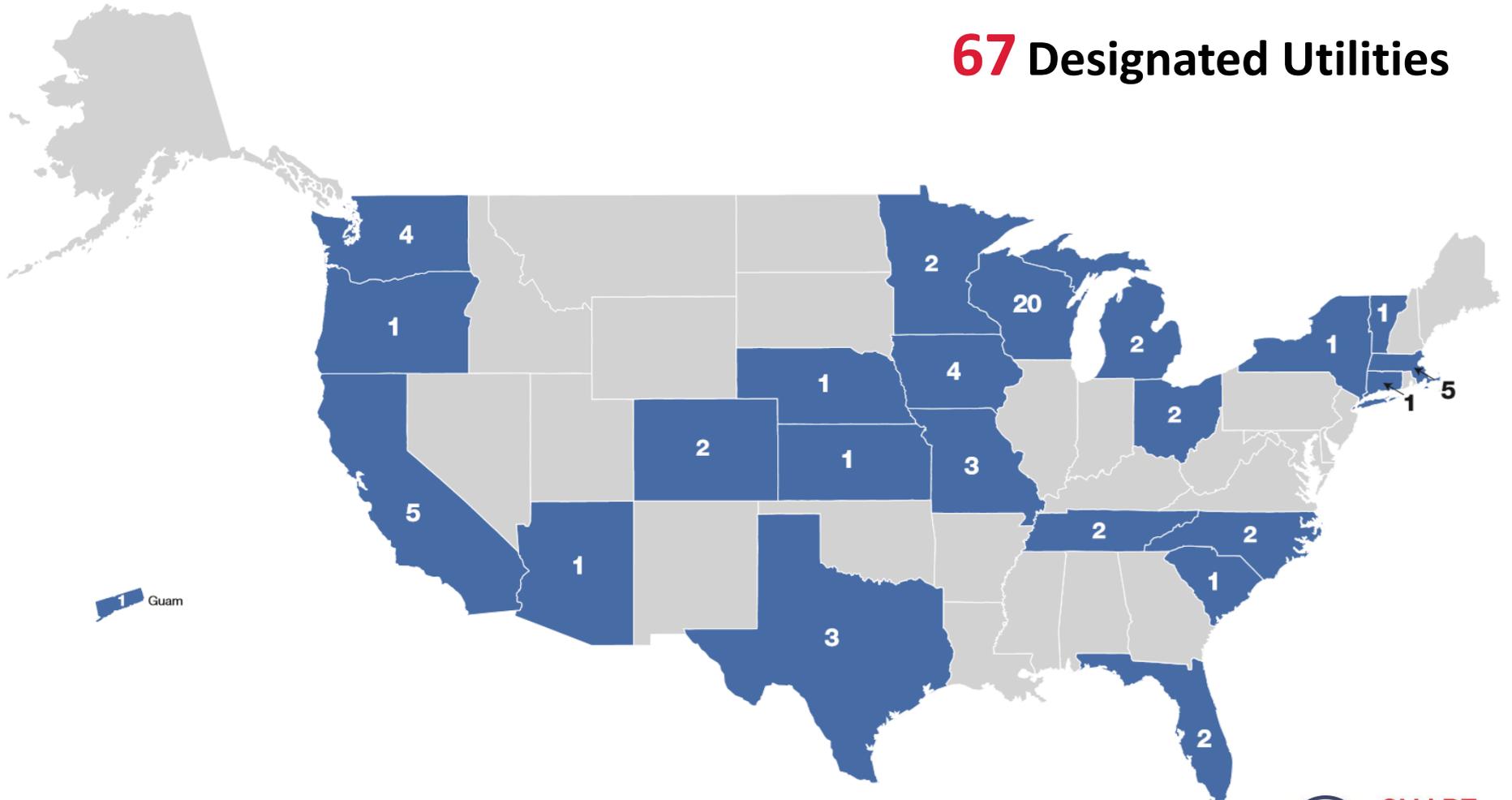
Environmental &
Sustainability
Programs/Initiatives
(23%)



Communication/
Education
& Customer
Experience (20%)

SEP CURRENT DESIGNEES MAP

67 Designated Utilities



Wisconsin Activity in Smart Energy

Wisconsin – the Smart State?

- Cedarburg
- Columbus Water & Light
- Florence Utilities
- Jefferson Utilities
- Kaukauna Utilities
- Lake Mills Light & Water
- Lodi Utilities
- Menasha Utilities
- New Holstein Utilities
- New London Utilities
- New Richmond Utilities
- Oconomowoc Utilities
- Reedsburg Utility
- Richland Center
- River Falls
- Stoughton Utilities
- Sun Prairie Utilities
- Two Rivers Water & Light
- Village of Prairie du Sac
- Waunakee Utilities

AMERICAN
PUBLIC
POWERTM
ASSOCIATION

Powering Strong Communities