

# Distribution System Planning Workshop

## Public Workshop #2 – Part 2

July 20, 2021





# Workshop #2 Information

## Teams Meeting Information

- Microsoft Teams meeting
  - Join on your computer or mobile app
  - [Click here to join the meeting](#)
  - Or call in (audio only)
  - [+1 563-275-5003,,984393064#](#) United States, Davenport
  - Phone Conference ID: 984 393 064#
- **Please place your phone on “Mute” when not speaking**
- **Please do not use the “Hold” function on your phone**
- Meeting attendance and public chat will be available at the website.
- Please use the chat function in TEAMS to provide any questions or comments during this presentation. We will do our best to address those as they come up, if we are unable to get to them, we will follow-up directly or at an upcoming workshop.



# Today's Goals

- Introductions
- Message from our leadership
- Technology and its role in DSP - Continuation
  - *Customer Usage Changes*
    - *Load Forecasting*
    - *Demand Side Management*
    - *Customer Generation*
    - *Transportation Electrification*
  - *Distribution automation*
- How to make technology building blocks part of the conversation with stakeholders
  - *Website, feedback and other methods*
  - *Review upcoming workshop topics*



# Customer Usage Changes



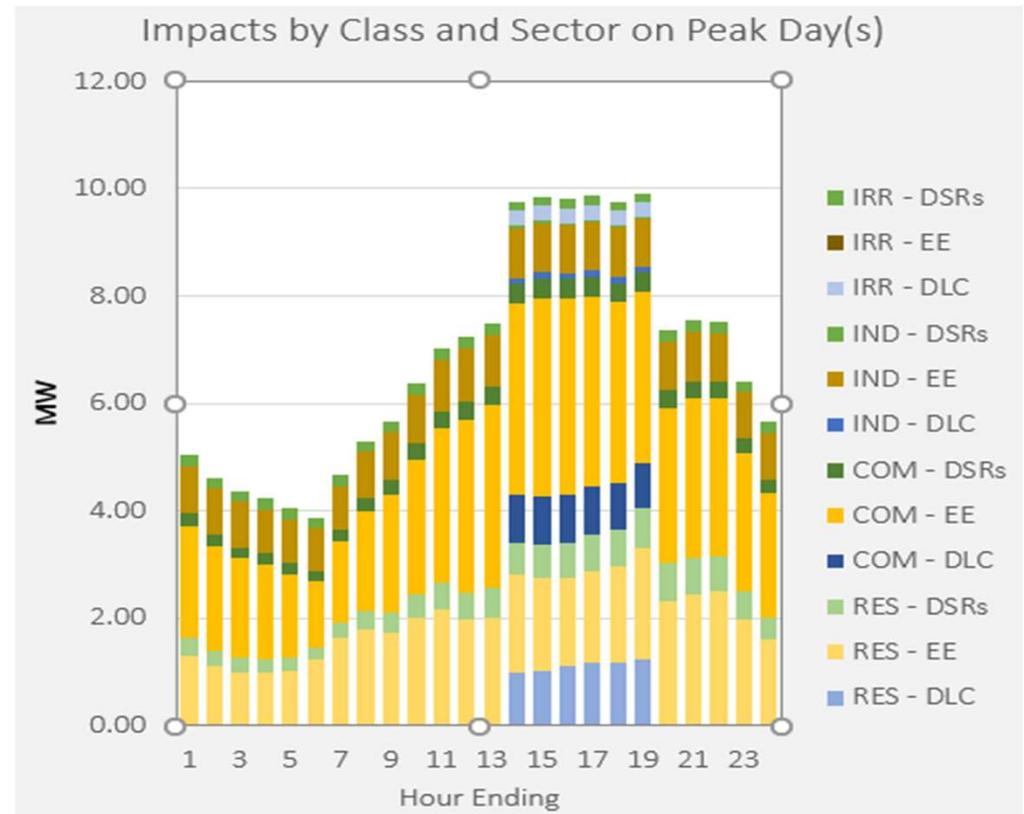


# PacifiCorp Long-term Load Forecast

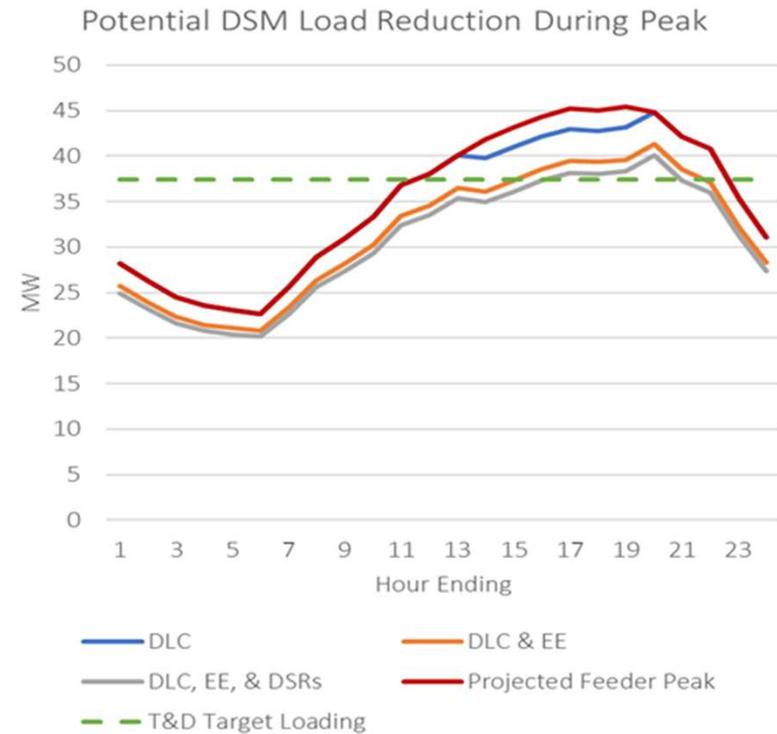
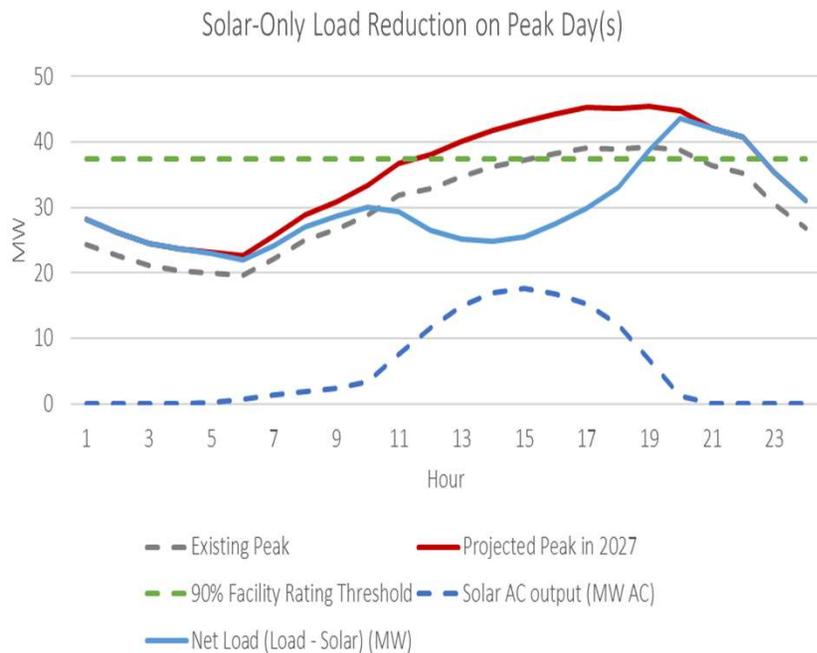
- Monthly regression models project class loads
  - Residential loads are forecast in two parts:
    - A customer model based on population forecast
    - A use-per-customer model using end-use stocks and efficiency trends (Statistically Adjusted End-Use Model)
  - Commercial and Industrial models
    - Remove large customer load from historical actual load
    - Forecast remainder of the class using econometric models
    - Add large customer forecast to modeled sales
  - 20-year Normal Weather
- Hourly Load forecast
  - Monthly loads
  - Historical hourly jurisdictional/state loads
  - 20-year peak producing weather pattern
  - Forecast jurisdictional/state peak loads
- Post Model Adjustments
  - Electric vehicles and building electrification
  - Private generation
  - Demand-side
- Load Pocket Forecast
  - State loads are allocated to load pockets on a percentage based on the aggregated substation forecast

# Demand Side Management (DSM)

- DSM resources can reduce overall load. However, the magnitude and timing of impacts vary depending on end-use, sector, and weather.
- EE and demand side rates are passive tools for load management. Only demand response allows for direct control of end-use load.
- Depending on the timing of peak and customer types on a feeder, specific DSM resources can be more or less effective at reducing peak load.

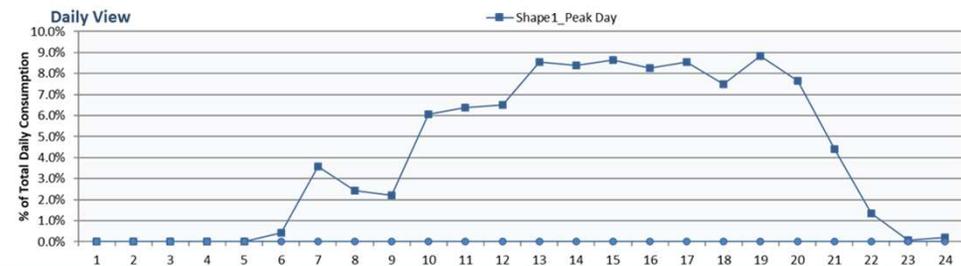
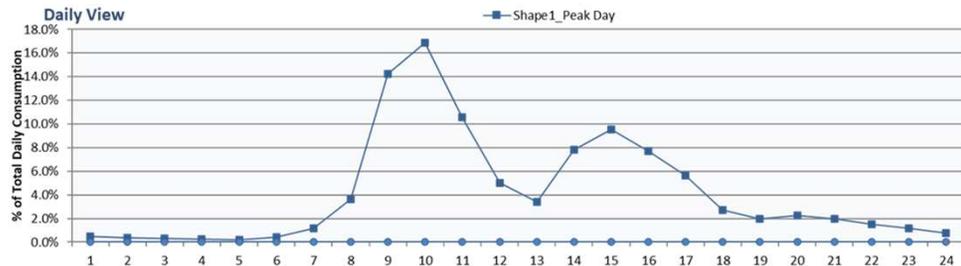
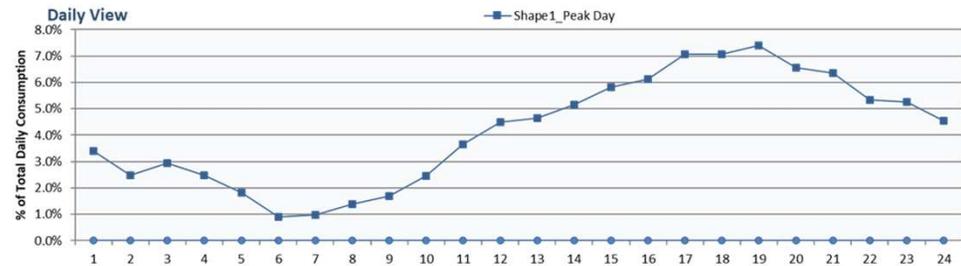


# How do technologies reduce peak loads?



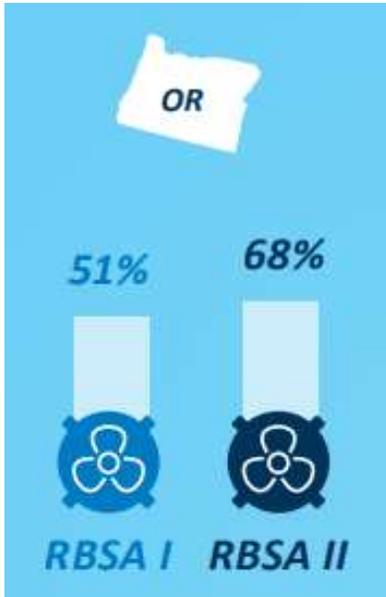
# How do technologies impact peak loads? Electric transportation

- These load shapes are from the RTF. Each of these shapes represent EV charging in different settings. Residential, commercial employees, and commercial public charging.
- Depending on the charger and customer type, load from EVs can look very different.
- Work is currently underway to learn more about EV load in our service area and how it may impact the distribution system.



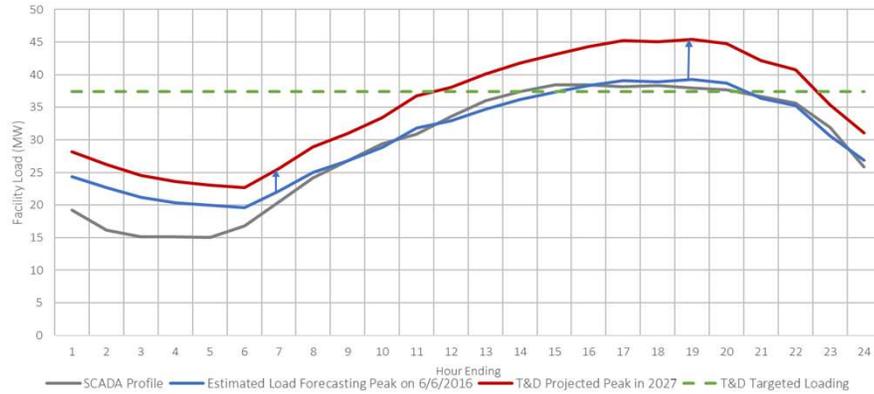
# How does climate change impact peak loads?

Proportion of homes with mechanical cooling

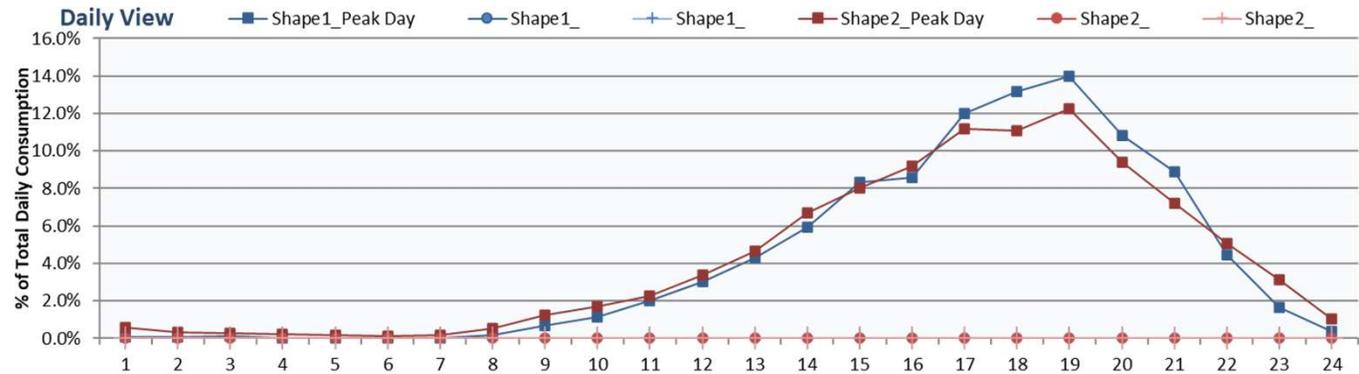


NEEA's residential building stock assessment, single family homes (2017).

Facility Daily Load Profile Comparison: Base Year and Year of Constraint

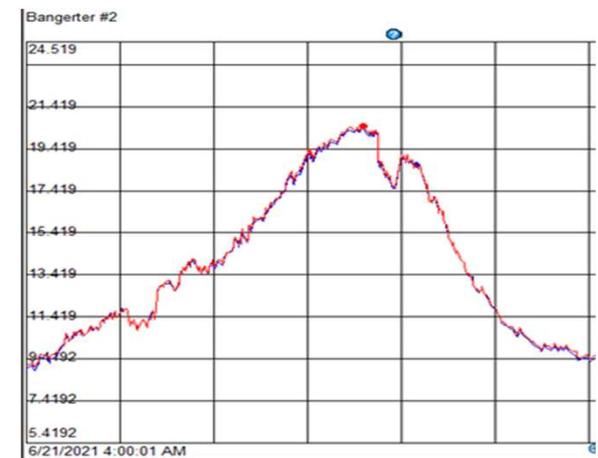
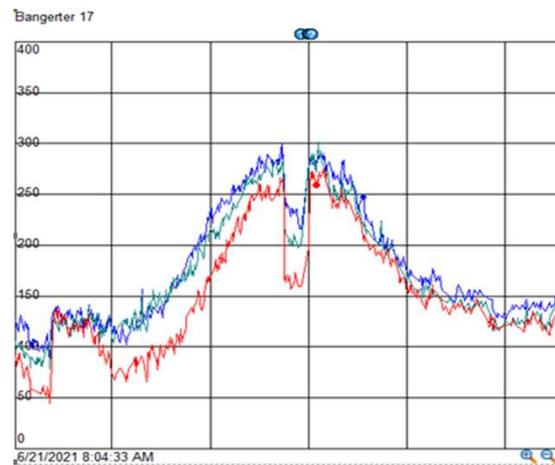
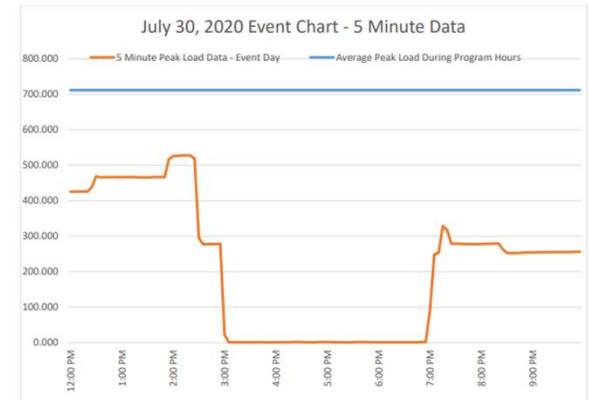
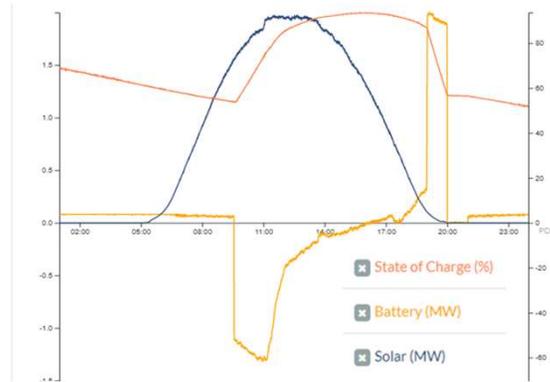


Central A/C and Room A/C load shapes



# Controllable Devices

- Expanding capabilities with controllable resources
- Behind the meter storage, irrigation load control, controllable AC
- The primary use has been to offset system peak, only recently moving into frequency response
- Must have sufficient localized capacity to impact distribution challenges
- Beginning to test distribution impact use cases

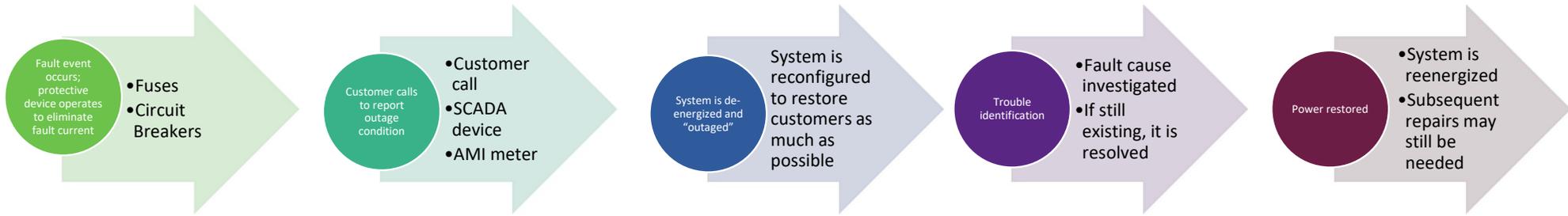




# Pilot Project



# What FLISR/DA does for reliability




**Legacy system without reclosing technology**

- About 45 minutes for responder to arrive
- 45 plus minutes for patrolling, correction and devices to be re-energized
- **Minimum 2 hours average; increases dramatically during extreme weather**



**Reclosing technology deployed**

- About 80% of faults cleared and power restored by automated devices (reclosers and circuit breakers/relays)
- Balance require field response to diagnose system issues, i.e. 20% remain
- **Similar response times to above, however smaller exposure generally means less time for patrolling & restoration, i.e. average about 100 minutes**

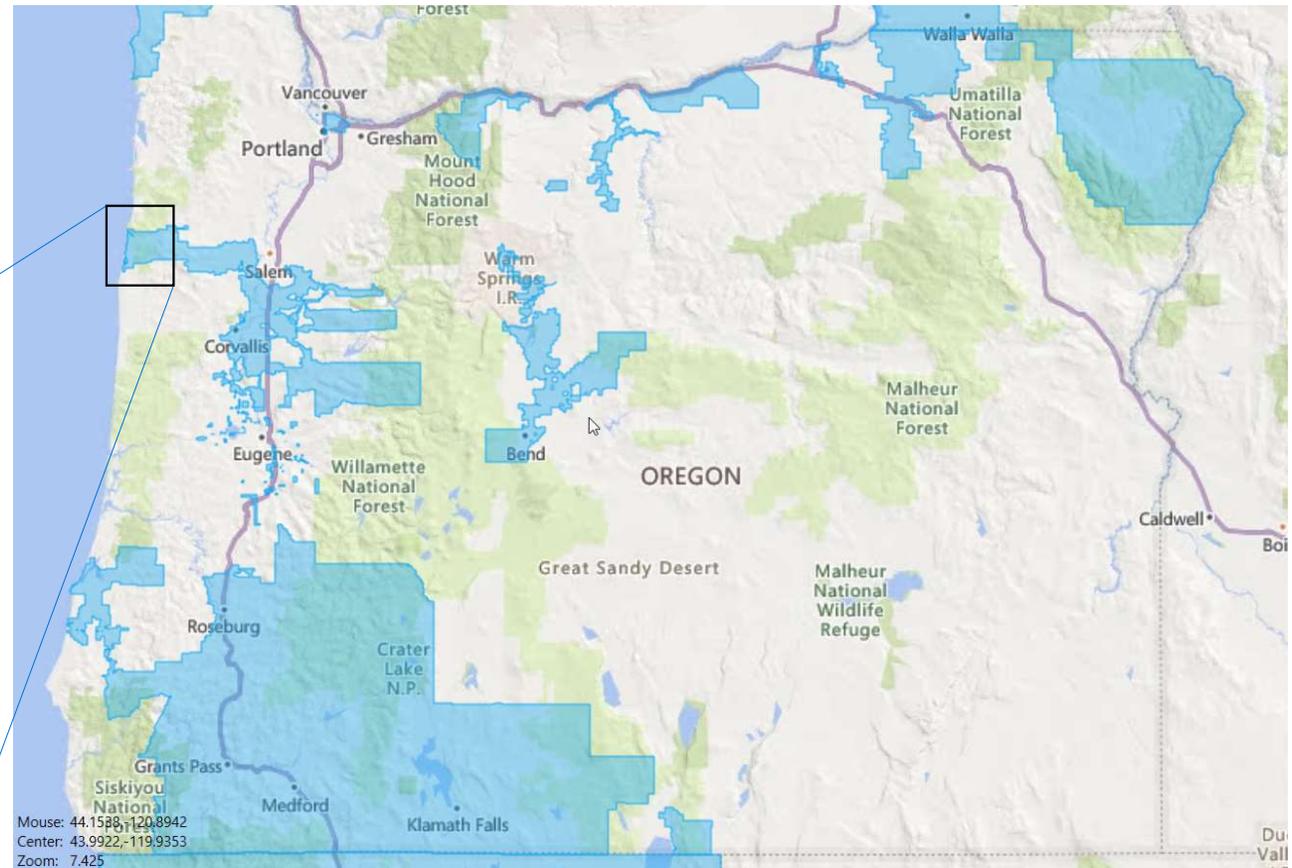
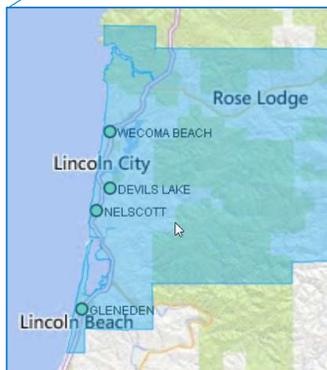


**FLISR/DA technology deployed**

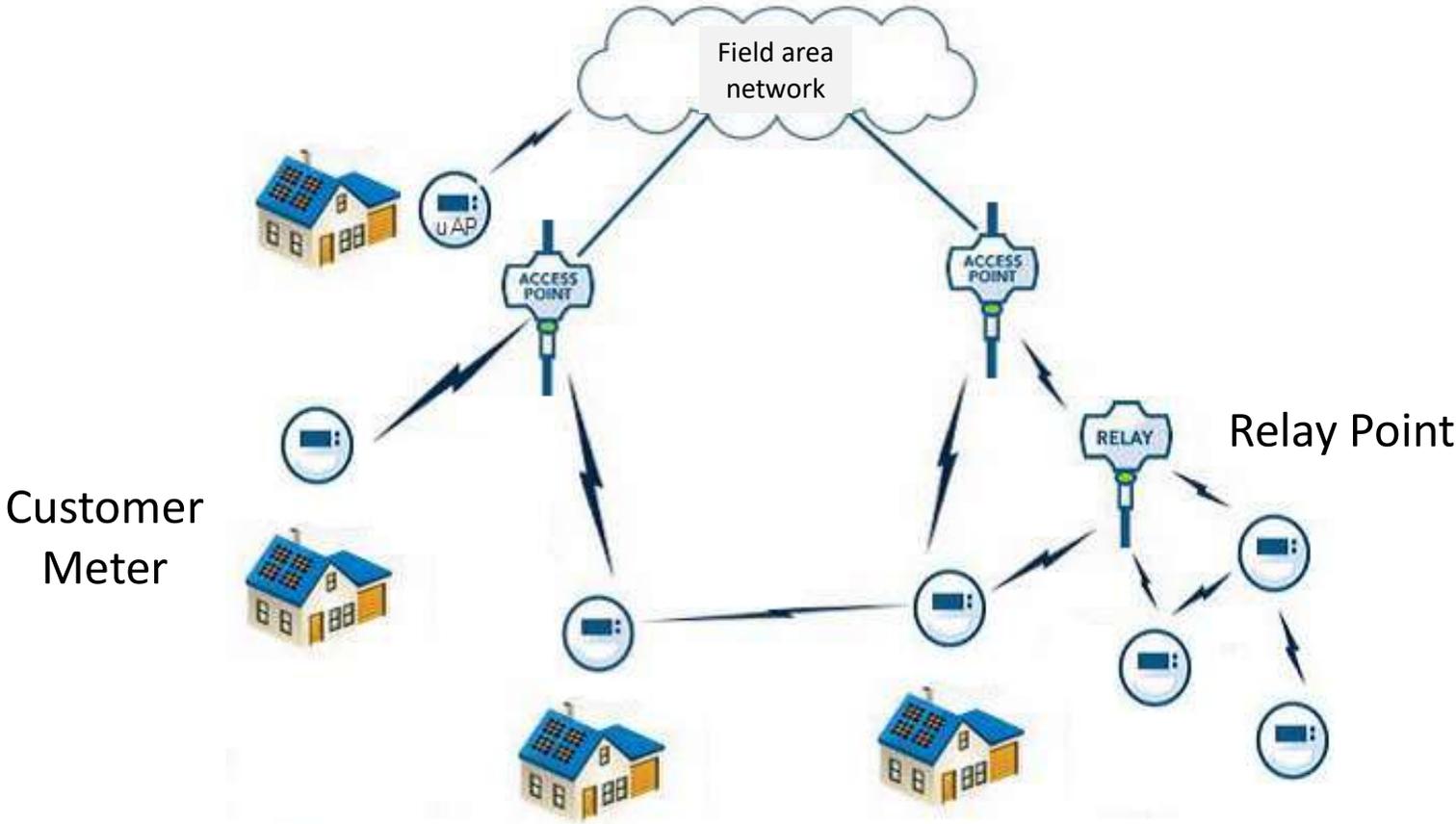
- All faults within "looped" zone restored by automated devices, with only damaged sections remaining de-energized
- **Usually the majority of customers are restored within about 10 minutes of fault event**
- Remaining customers within damaged section should experience shorter duration since field investigation is more limited than otherwise

# Lincoln City FLISR/DA Pilot

- Pacific Power serves just over 12,000 customers in the Lincoln City op area;
- 7,600 customers are served from two circuits on which the pilot technology has been deployed
- Nine reclosers and new substation equipment were required for the project
- System modifications are being performed to ensure it delivers required reliability and security



# Customer Meter Communication



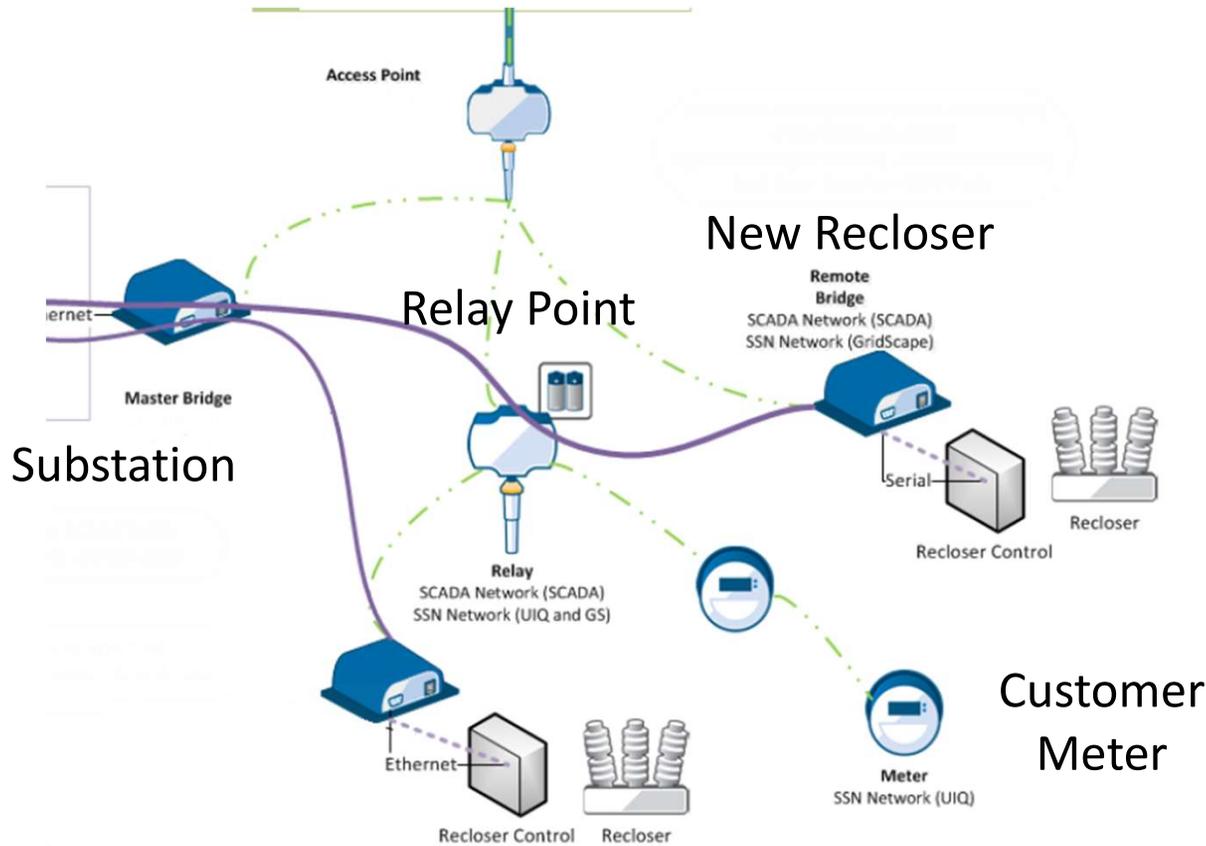
## Reclosers act as the controlling technology for rerouting the network

Switches are controlled two ways:

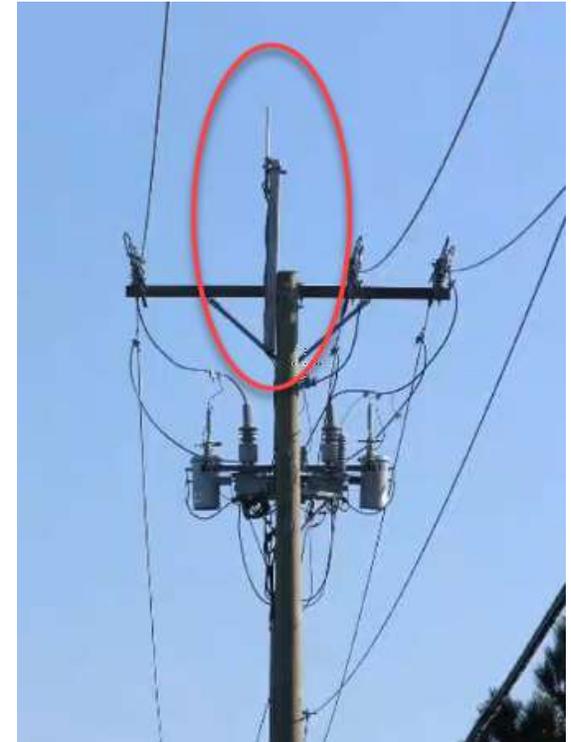
1. Programmatic: Substation Based Automation
2. Human Intervention: Operator Controlled From Portland



# Automation Built on Extensible Communication Network, piloting AMI Network



Relay Point



New Recloser

# Dispatch Controlled

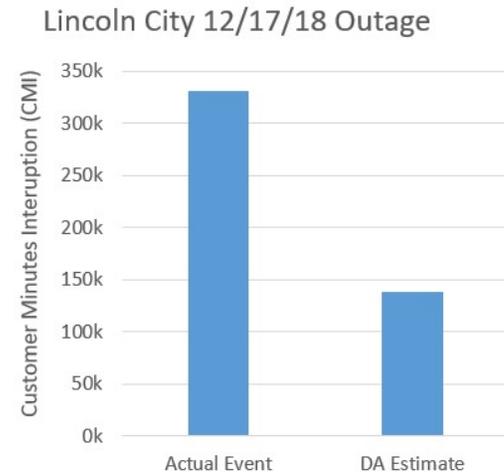
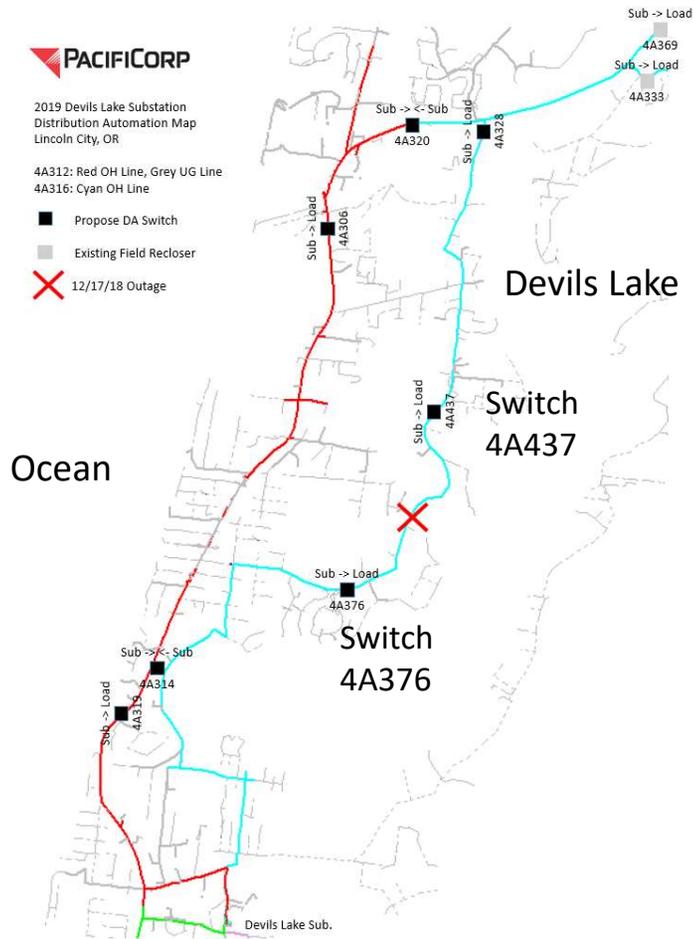


# Substation Based Automation



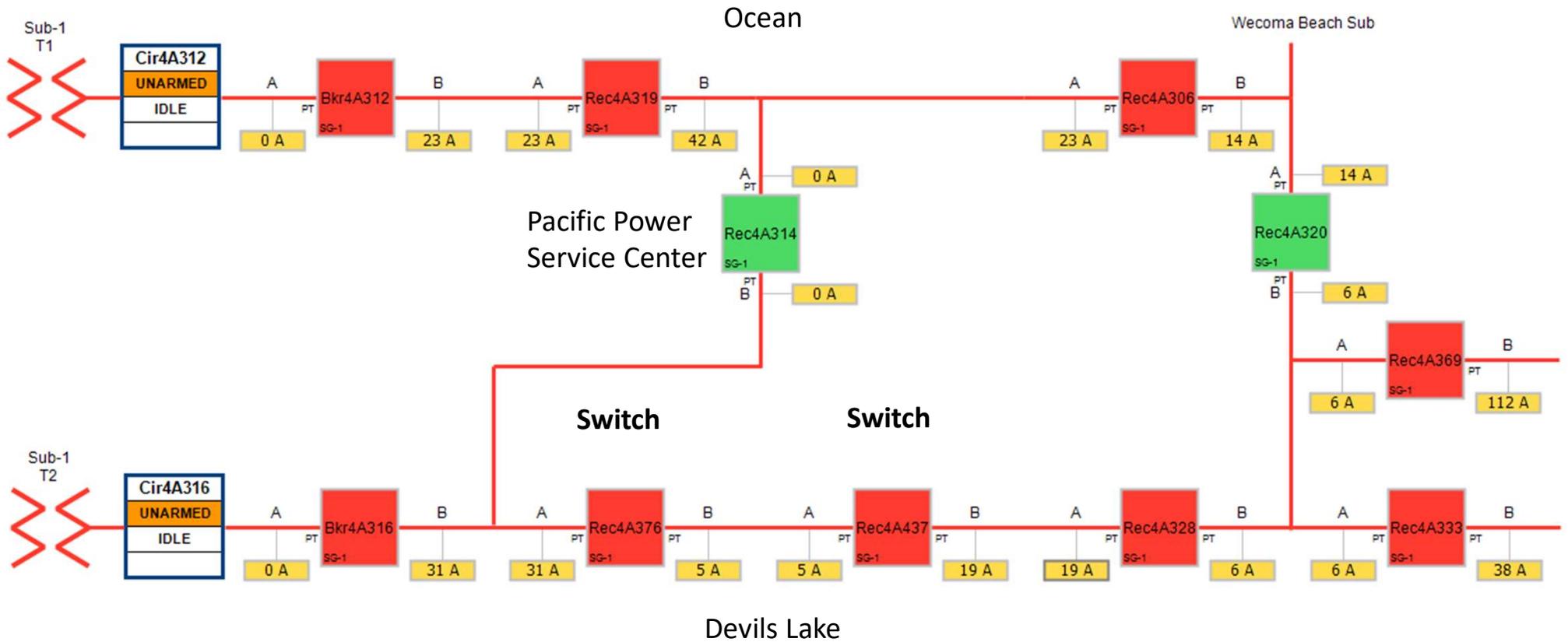


# FLISR/DA: Real-Life Example

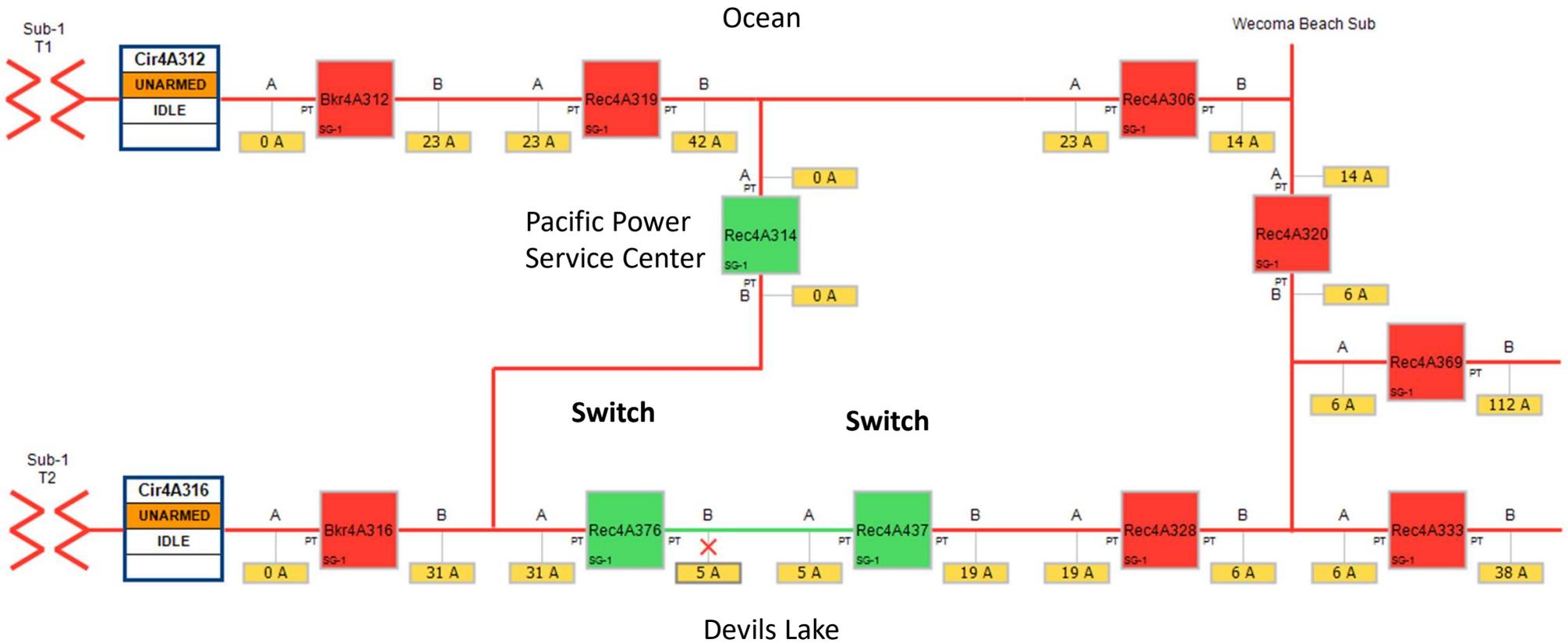


No DA/FLISR: an average of 45 min outage  
With DA/FLISR: an average of 8 min outage

# Normal Switch Layout



# Faulted Switch Layout





## Barriers/Enablers to DSP Vision Implementation

- Data needs
- Computing requirements
- Resource availability
- Uncertainty of credible cases now and in the future
- Building the new processes while not ignoring the legacy processes
- Time
- Cost
- Who benefits for the non-trivial investment



# Feedback in the DSP Process

- How to make technology building blocks part of the conversation with stakeholders
  - *Website, feedback and other methods...brainstorm!*
    - *Website*
    - *Reached out via email*
    - *Established a stakeholder feedback form*
    - *Conducted meetings requesting questions, thoughts, etc.*
    - *Appreciate any way in which we can better the dialogue*
    - *Thoughts? We'll take a few moments to collect your ideas in the chat panel*
  - *Review upcoming workshop topics*
    - Integration of system planning: IRP, wires (both T&D) and customer usage changes
    - Integration of stakeholder feedback into legacy planning processes and the roadmap toward PacifiCorp's DSP vision



# Question & Answer





# Next Steps

- **Schedule**

- Pacific Power Public Workshop #3: Friday, July 30, 2021, from 1 pm to 3 pm: **ALERT, this conflicts with an IRP meeting so we will be reaching out to reschedule with group**
  - Intended topics: Integration of system planning: IRP, wires (both T&D) and customer usage changes
- Pacific Power Public Workshop #4: Tuesday, August 24, 2021, from 10 am to 12 pm
  - Intended topics: : Integration of stakeholder feedback into legacy planning processes and the roadmap toward PacifiCorp's DSP vision
- Distribution System Plan (Part 1) to be filed on October 15, 2021

*Meeting dates and times subject to change*



# Closing





# Additional Information

- DSP Email / Distribution List Contact Information
  - [DSP@pacificorp.com](mailto:DSP@pacificorp.com)
- DSP Presentations
  - [Pacific Power Oregon DSP Website](#)
- Additional Resources
  - [Pacific Power's 2019 Oregon Smart Grid Report](#)
  - [Pacific Power's Oregon Transportation Electrification Plan](#)
  - [PacifiCorp's Integrated Resource Plan](#)



# Thank You!

