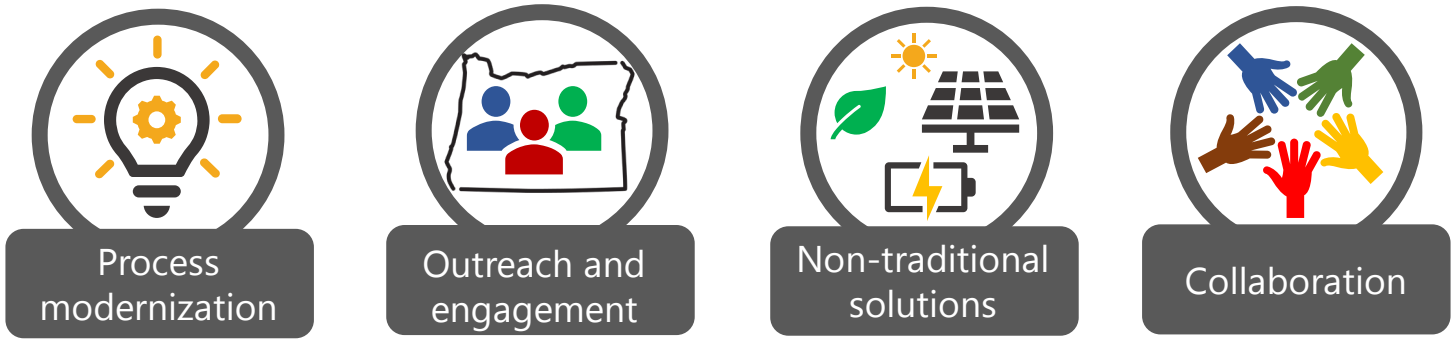
Prineville
Distribution System Planning
Community Workshop #2
August 9th, 2023

Presenters:
Ian Hoogendam – DSP Manager, Daniel Morgan– Engineer



DISTRIBUTION SYSTEM PLANNING

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Workshop #2 Information

Microsoft Teams meeting info:

Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 223 695 801 212
Passcode: qy3tXK
Download Teams | Join on the web
Call in (audio only)
+1 563-275-5003,,637457066# United States, Davenport
Phone Conference ID: 637 457 066#

- Please **place your phone on "Mute"** when not speaking
- If you call in using your phone in addition to joining via the online link, please make sure to **mute your computer audio**
- Please **do not use the "Hold"** function on your phone

Participation:
This workshop is available to the public, and there is a Questions/Comment section at the end of the workshop for online participants.

Please input your name and organization into the chat when you enter, and please "raise your hand" during the Open Discussion section to ask questions or provide input.

This workshop will be recorded and published to the PacifiCorp DSP website.

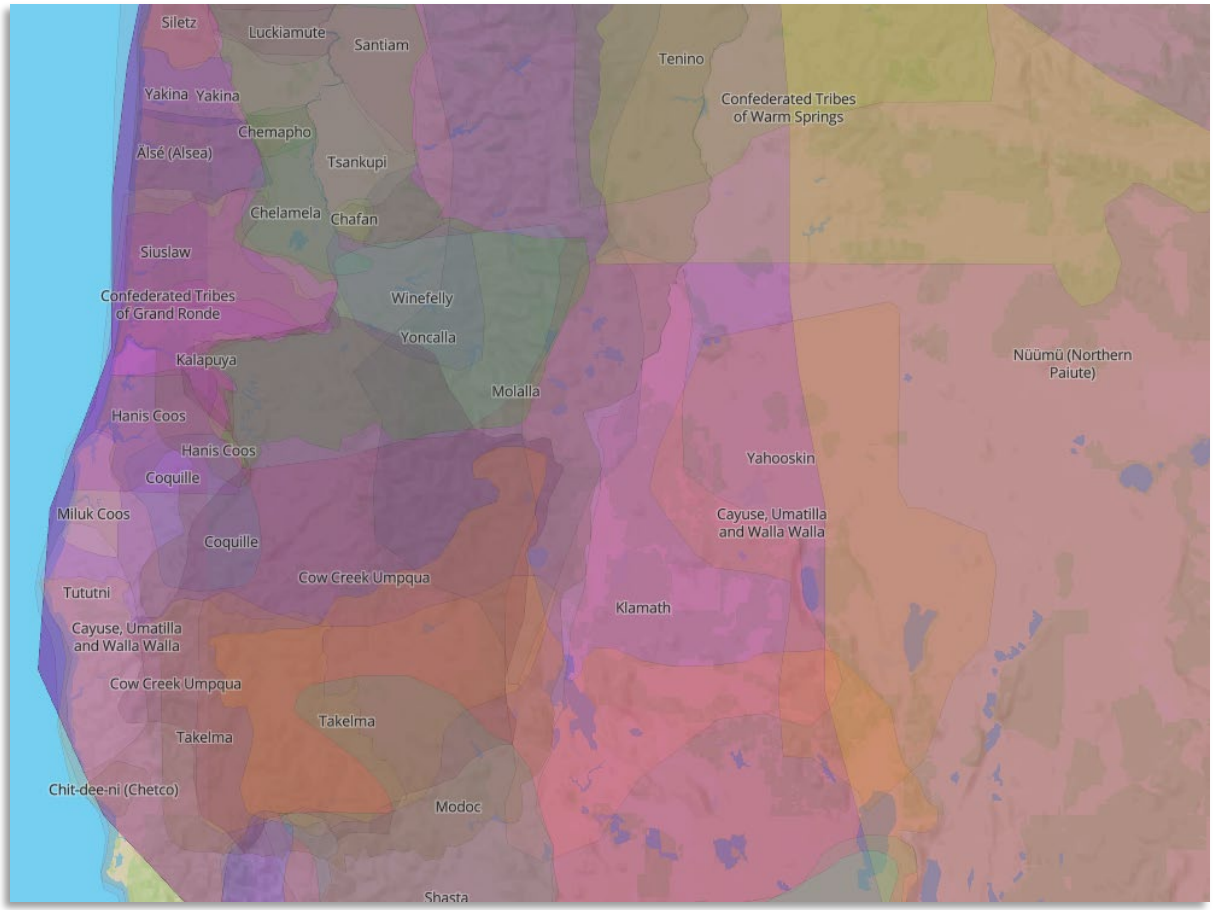
Land Acknowledgement

We are meeting online from various locations within the United States.

To learn about the original stewards of the land where you are now, this is a wonderful resource:

Native Land Digital

https://native-land.ca



By acknowledging Indigenous peoples and tribes, their traditional homeland ties are renewed and reaffirmed.

SOURCE: Native-Land.ca | Our home on native land

Today's Agenda

5	Introductions
10	Recap of Last Meeting
20	Overview of Grid Needs and Solutions
10	Break
25	Forecasted Grid Needs and Potential Solutions
15	Open Discussion

Introductions – Pacific Power Team Members

Distribution System Planning

- Ian Hoogendam – DSP Manager
- Shauna Thomas – DSP Program Specialist
- Daniel Talbot – DSP Engineer
- Daniel Morgan – DSP Engineer
- John Rush – Project Manager

Local Prineville Team

- Matthew Grubbs– Field Engineer
- Matt Chancellor– Regional Business Manager

Introductions – Prineville Participants

- Steve Forrester, City of Prineville
- Eric Klann, Divergent
- Caroline Ervin, City of Prineville
- Ryan Bowen , RHT Energy
- Brian Barney – Crook County
- Kim Daniels,

  Crook County Chamber of Commerce
- Kelsey Lucas,

  Economic Development - Central Oregon
- Energy Trust of Oregon

- Matt Smith, City of Prineville
- Russ Deboodt, City of Prineville
- Steve Uffelman, City of Prineville
- Josh Smith, City of Prineville
- Jake Stephens --NewSun Energy
- Todd Shields – St. Charles Hospital
- Jerry Brummer – Crook County
- Seth Crawford – Crook County
- Lori Scharton, NeighborImpact
- Jessica Taylor, NeighborImpact

Workshop Objectives

Success is a transparent, robust, and holistic distribution system planning framework.

Education

- Explaining traditional solution approaches and nontraditional solution programs
- Development and comparison of solutions

Engagement

- Gathering input about the solutions being considered
- Understanding the needs, values, and concerns of the community

Transparency

- Involving the community throughout the process
- Sharing of processes, analysis results, decisions, and learnings

What do you hope to get out of today's discussion?

Recap of Last Workshop

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What is Distribution System Planning (DSP)?

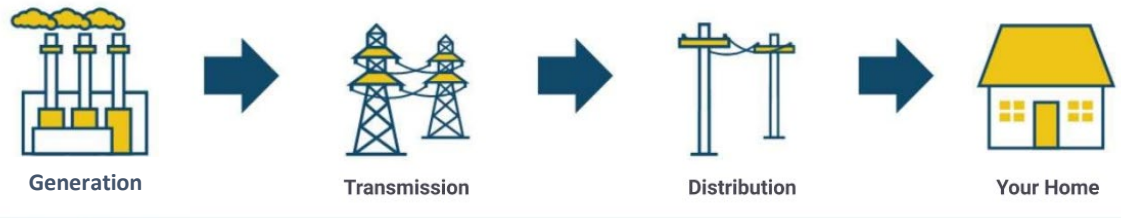
What is Oregon DSP?

- Advancements to traditional DSP based on guidelines proposed by Oregon PUC staff
- Increased transparency of DSP processes to meet the needs and leverage the capabilities of the modern grid

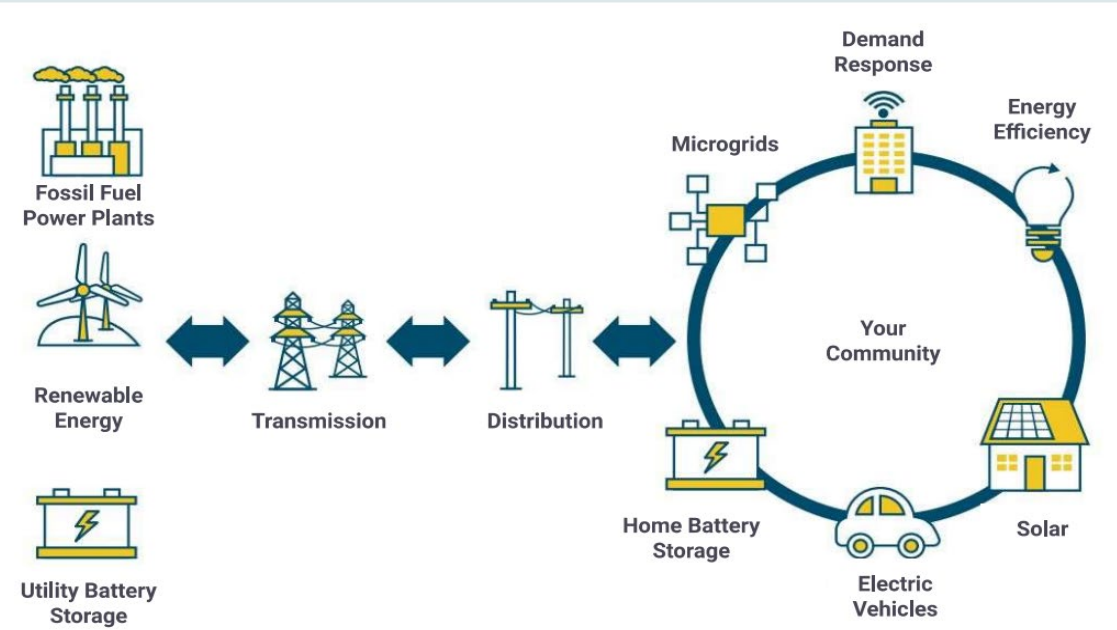
Key Changes to Traditional DSP

- Evaluation of nontraditional solutions to address grid needs
- Increased community engagement
- Enhanced forecasting:
  - 24-hour demand profiles
  - Inclusion of incremental electric vehicle (EV) and solar adoption rates

Past Grid



Modern Grid



Electric Grid Overview

Generation

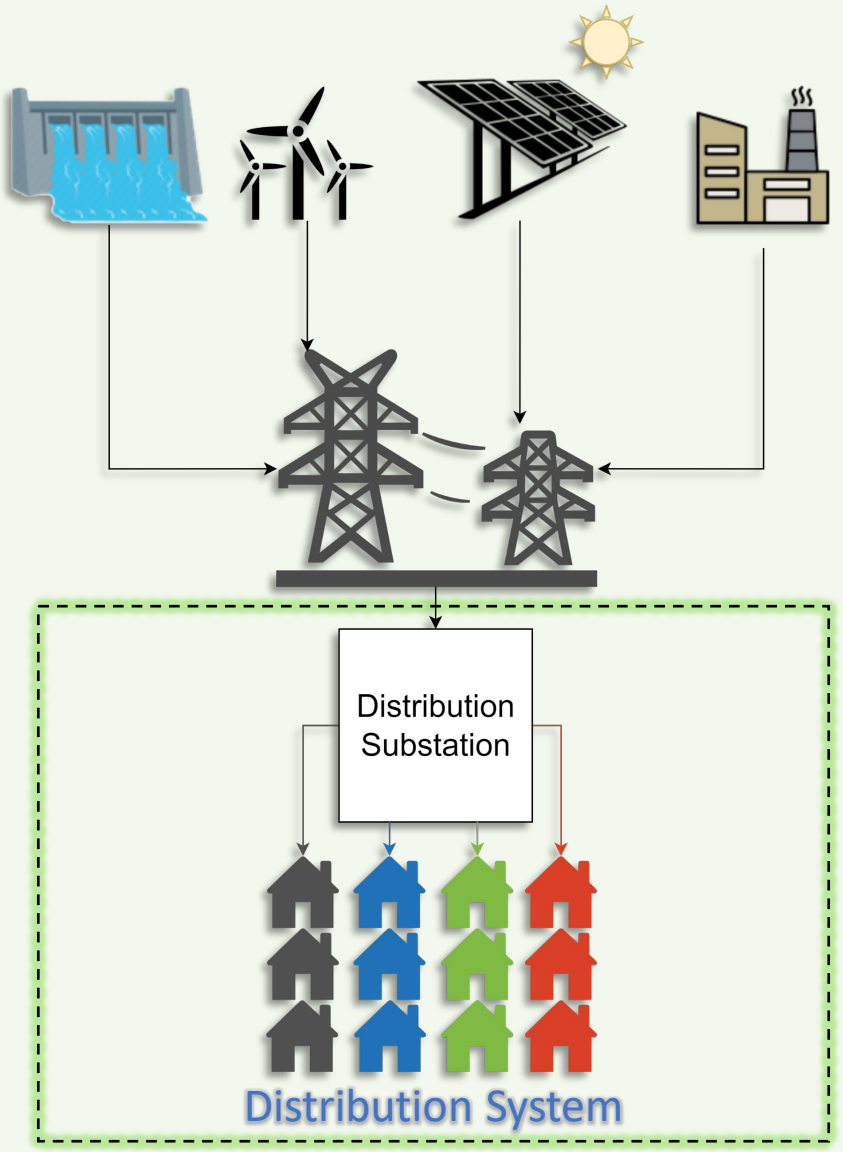
- Generates power from various resources

Transmission System

- Transmits power from generation plants to distribution substations

Distribution System

- Starts at distribution substation and ends at customer meter
- Delivers power to consumers via poles and wires (overhead and underground)



Prineville Area Overview

Distribution System

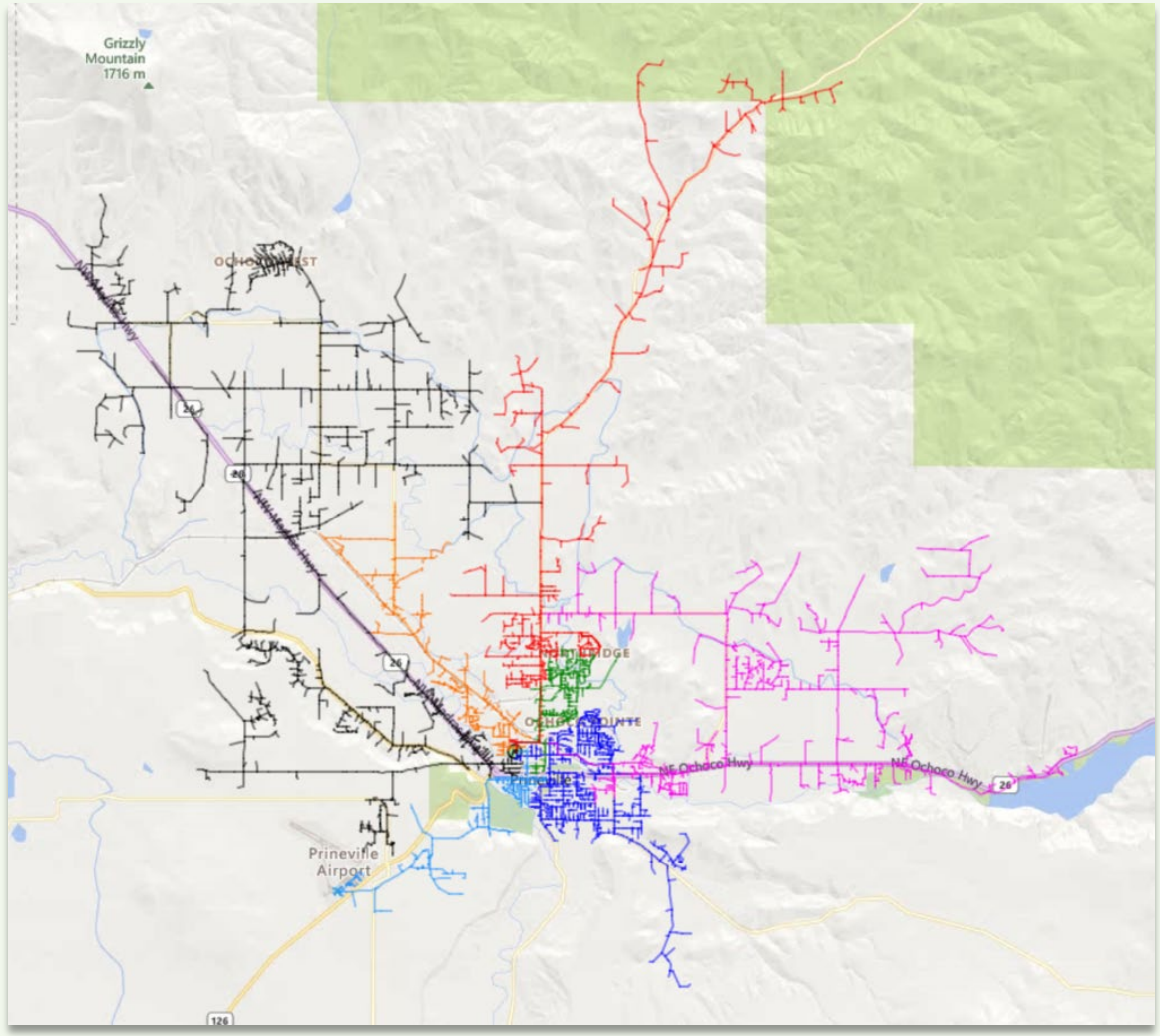
- Circuits: 7
- Line miles: 347 (sum of pole-to-pole distance)

Customers

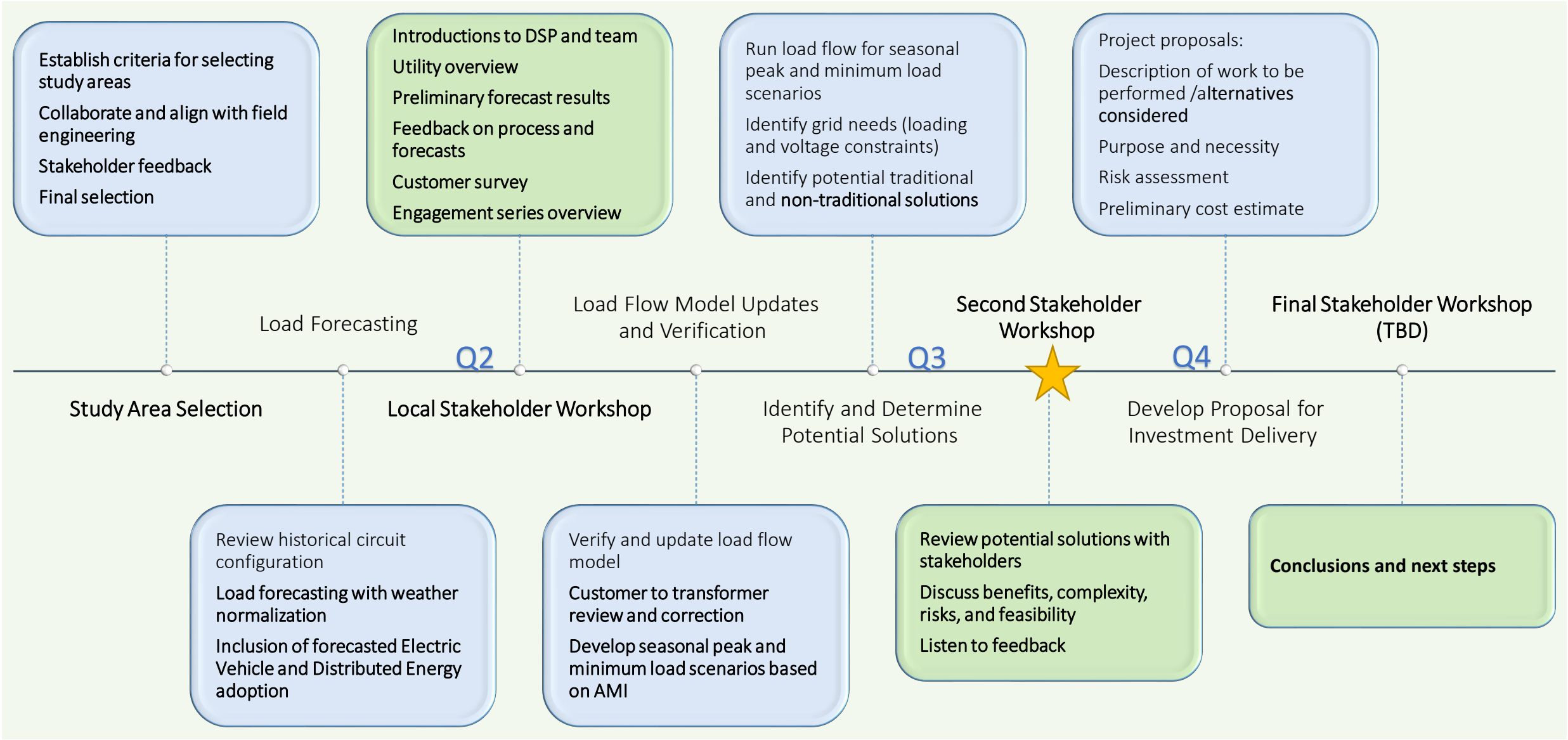
- Residential: 7,490
- Commercial: 1,199
- Irrigation: 387
- Industrial: 37

Other Characteristics

- Limited SCADA history
- New substation transformer by Fall 2023
- Large datacenters served by transmission
- Higher loads in winter, but equipment closer to capacity in summer



2023 DSP Study Process and Local Engagement Plan



Grid Needs and Solutions Overview

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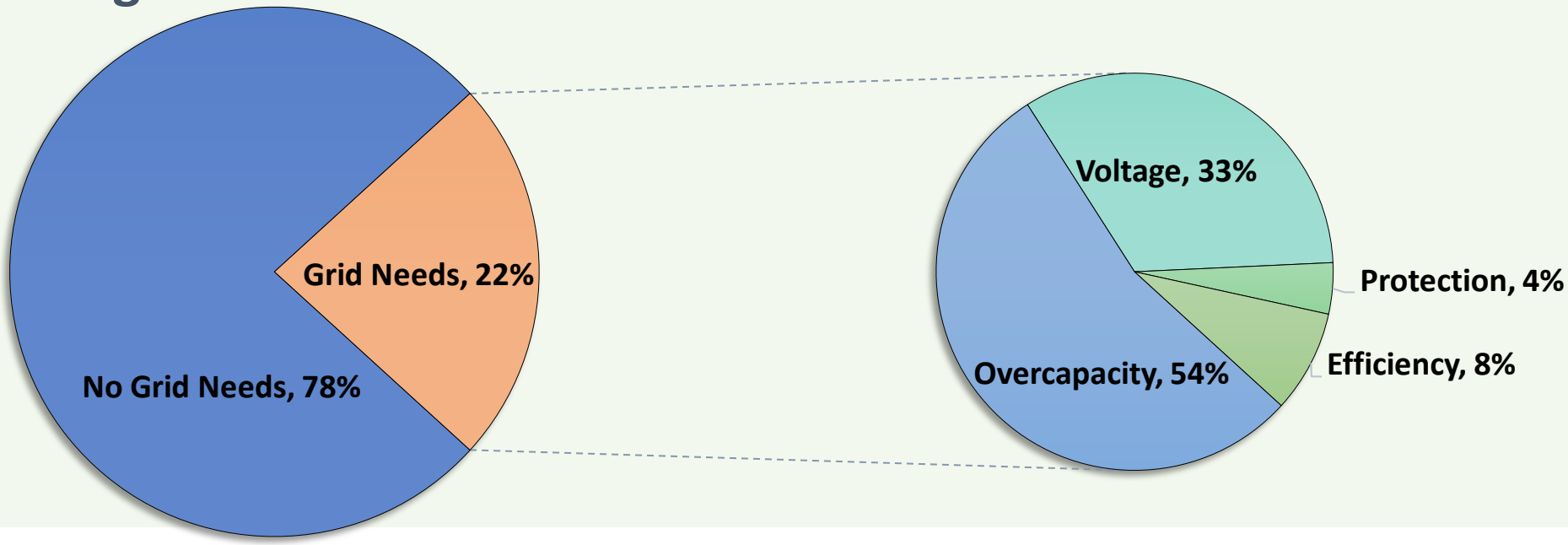
Types of Grid Needs

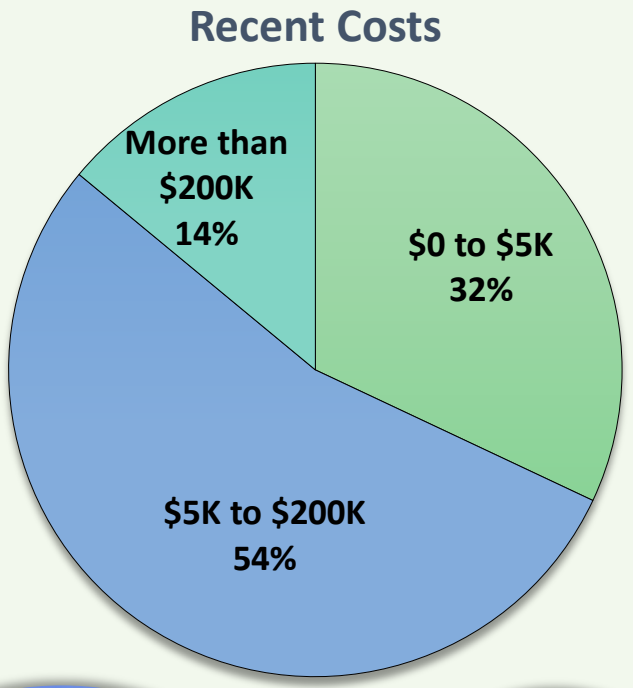
Overcapacity	Demand exceeds capacity of distribution system equipment
Voltage	Voltage levels that result in unsatisfactory performance of customer equipment
Protection	Expected loading conditions compromise the grid's ability to operate safely and reliably
Efficiency	Inefficiencies that result in avoidable power costs to the utility and can lead to other grid needs

Oregon Distribution Circuit Grid Needs from Recent Studies



Traditional Solutions: *Poles, Wires, Equipment*

Equipment Upgrades	➢Increase capacity of system equipment
New Equipment	➢New equipment to address voltage/protection needs or facilitate load transfers
New Substations and Circuits	➢Sometimes required in conjunction with other traditional solutions
Load Transfers	➢Transfer load to circuits with spare capacity
Phase Balancing	➢Balancing load among circuit wires
Settings Changes	➢Update equipment settings to ensure safe and reliable service for expected loading conditions



Nontraditional Solutions: *Energy Programs*

Solar

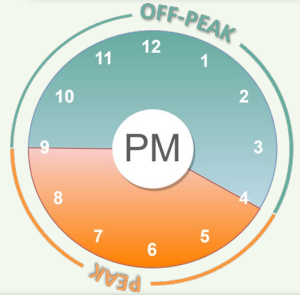
- Accelerate solar adoption in area through marketing and incentives

Energy Efficiency

- Accelerate energy efficiency in area through marketing and incentives

Demand Response

- Lower peak demand by managing behind the meter devices:
  - Batteries, Smart Thermostats, Water Heaters, EV Charging



Partnerships

- Collaboration with partners on unique/innovative solutions

Grid Need Screening and Nontraditional Solution Development

Grid Need Screening

- Traditional solution cost > $200k
- Solution needed in 5-10 years

Program Feasibility

- Basic understanding and ability to estimate effectiveness
- Implementation partners available

Program Effectiveness

- Program lessens severity of grid need

Nontraditional Solution Development

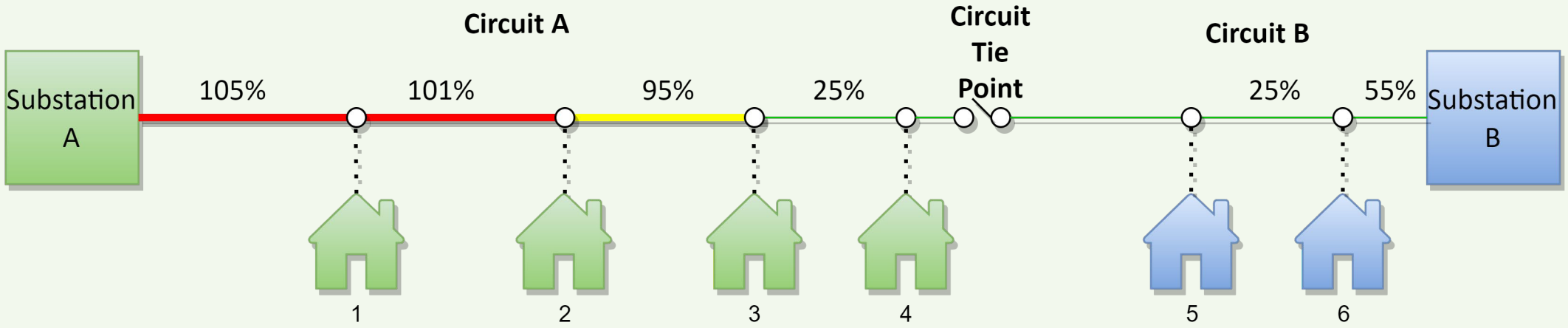
- Combinations of programs to resolve grid need

Nontraditional Solution Screening

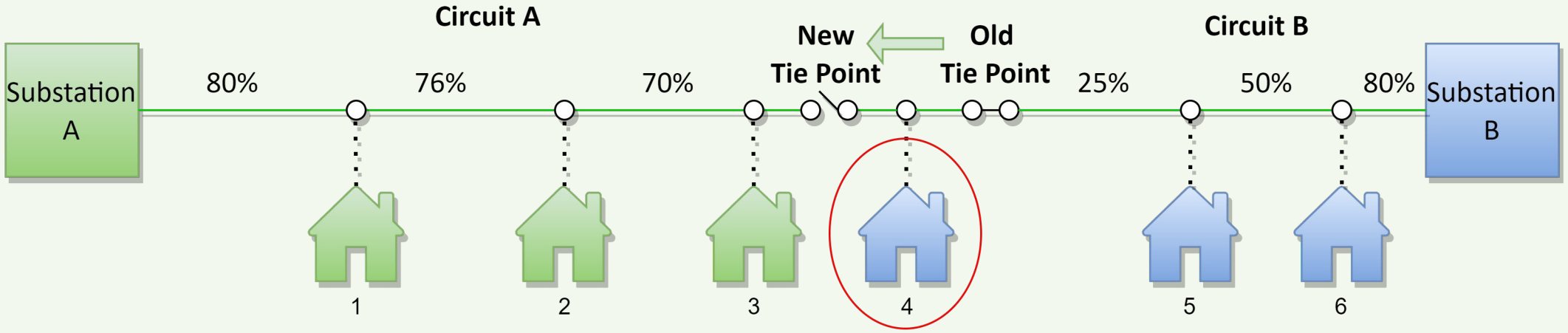
- Cost effective solution for participants and utility
- Estimated participation sufficient to resolve grid need

Traditional Solution Example: Load Transfer

Grid Need: Peak loading exceeds distribution wires rating

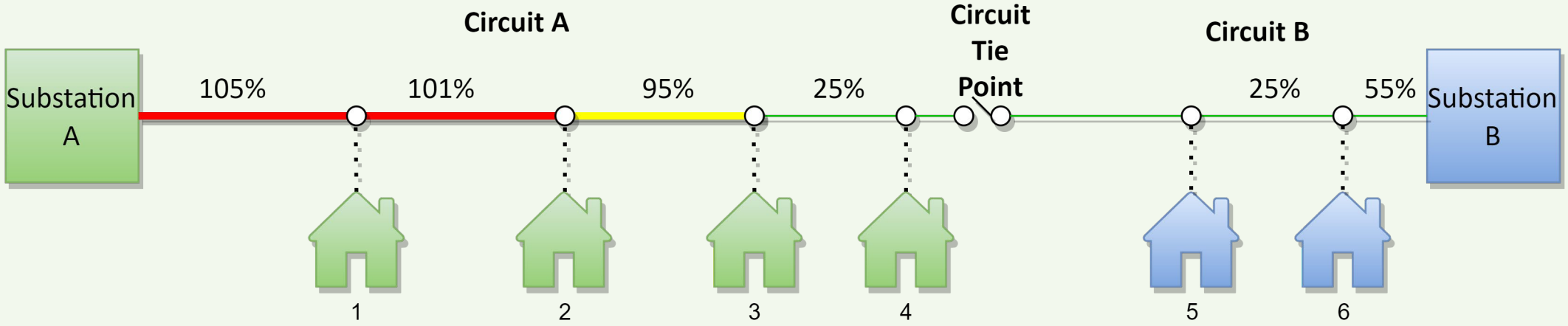


Solution: Load transfer from Circuit A to Circuit B

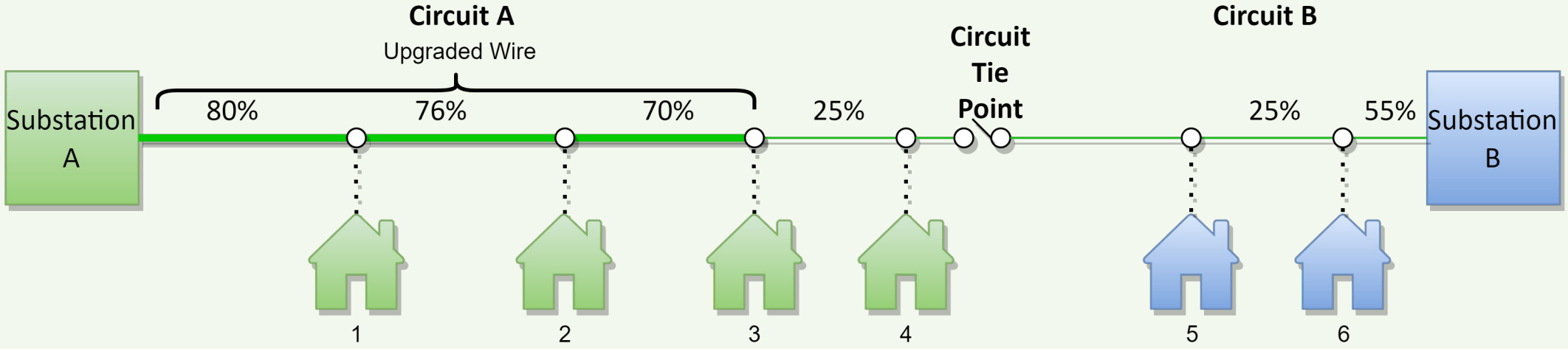


Traditional Solution Example: Upgrading Conductor

Grid Need: Peak loading exceeds distribution wires rating

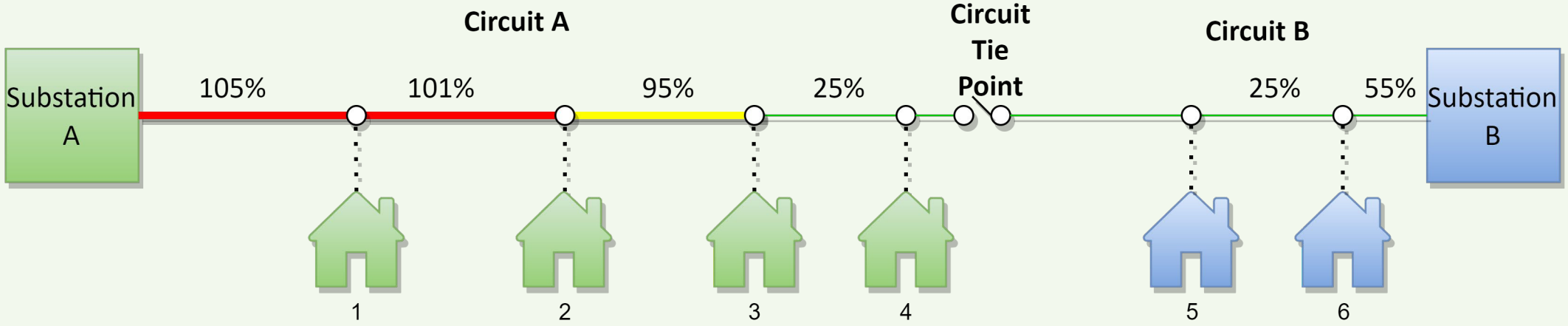


Solution: Upgrade wire to larger size to increase capacity rating

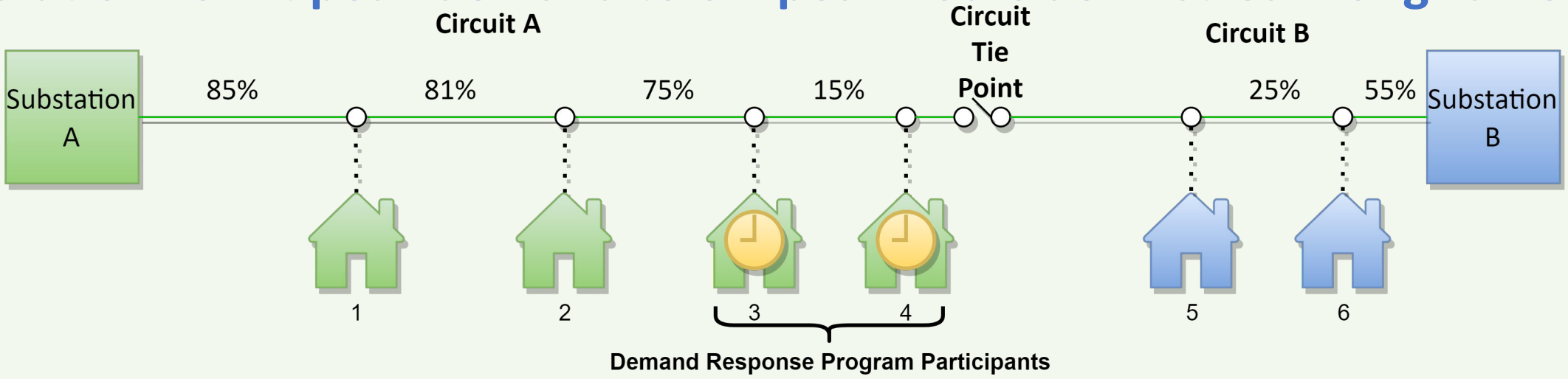


Nontraditional Solution Example: Demand Response

Grid Need: Peak loading exceeds distribution wires rating



Solution: Shift peak demand to off-peak hours downstream of grid need



Example Solution Comparison Matrix

Solution / Characteristic	Larger Wire	Solar	Solar + Battery + Demand Response	Energy Efficiency	Smart Thermostat Demand Response
Simplicity	★★★	★★☆	★☆☆	★★☆	★☆☆
Will this be able to address the grid need in time	★★★	★★☆	★☆☆	★★☆	★☆☆
Technical Feasibility	★★★	★☆☆	★★☆	★★☆	★★☆
Cost: Participant	N/A	★★☆	★☆☆	★★★	★★★
Cost: Utility	★★☆	★★★	★★☆	★★★	★★☆
Customer and Community Benefits	N/A	★★★	★★★	★★★	★★★

Break (10 Mins)

Ti Start Timer g

TIME TO RESUME

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Forecasted Grid Needs and Potential Solutions

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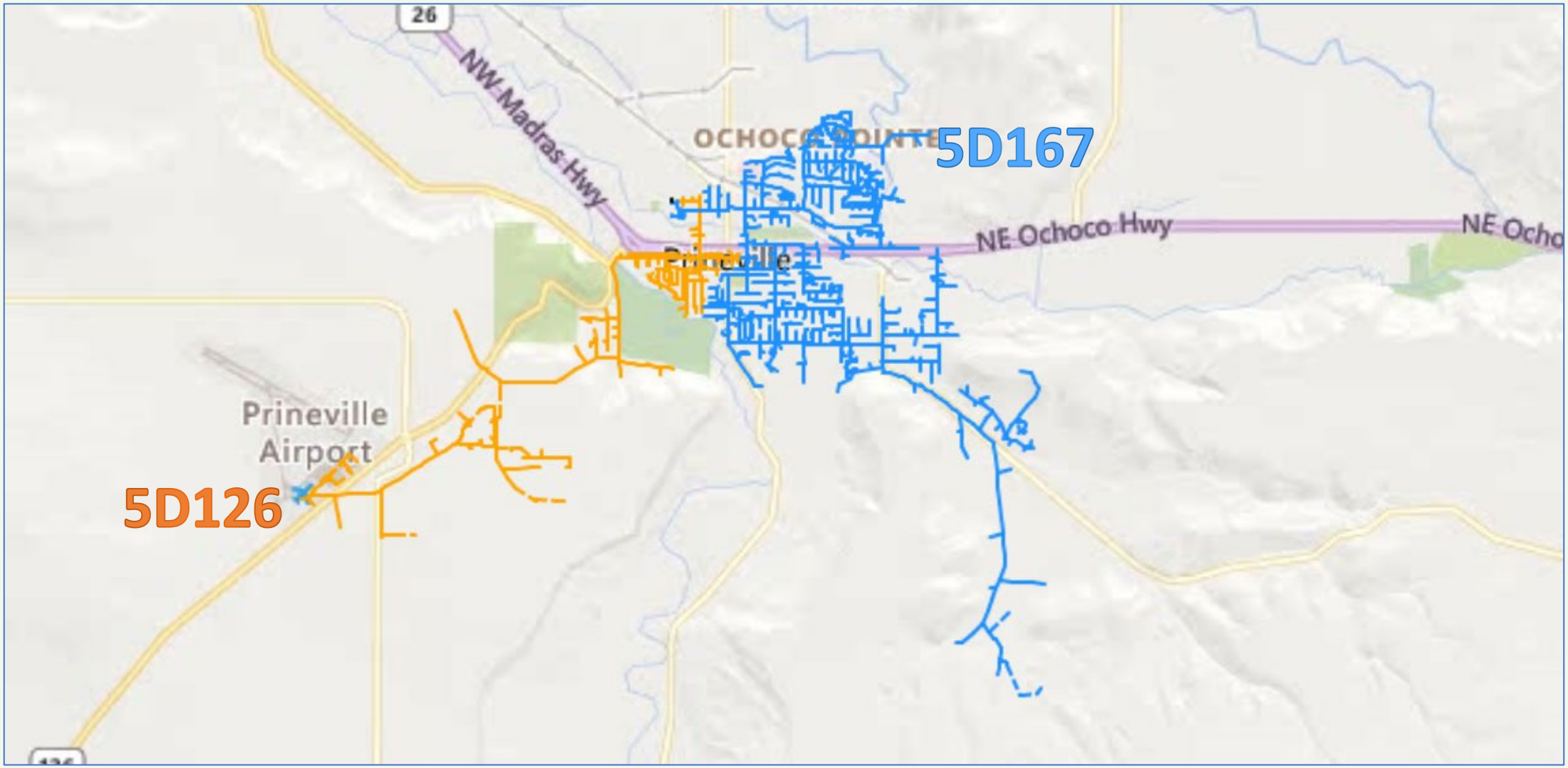
Prineville Target Circuits



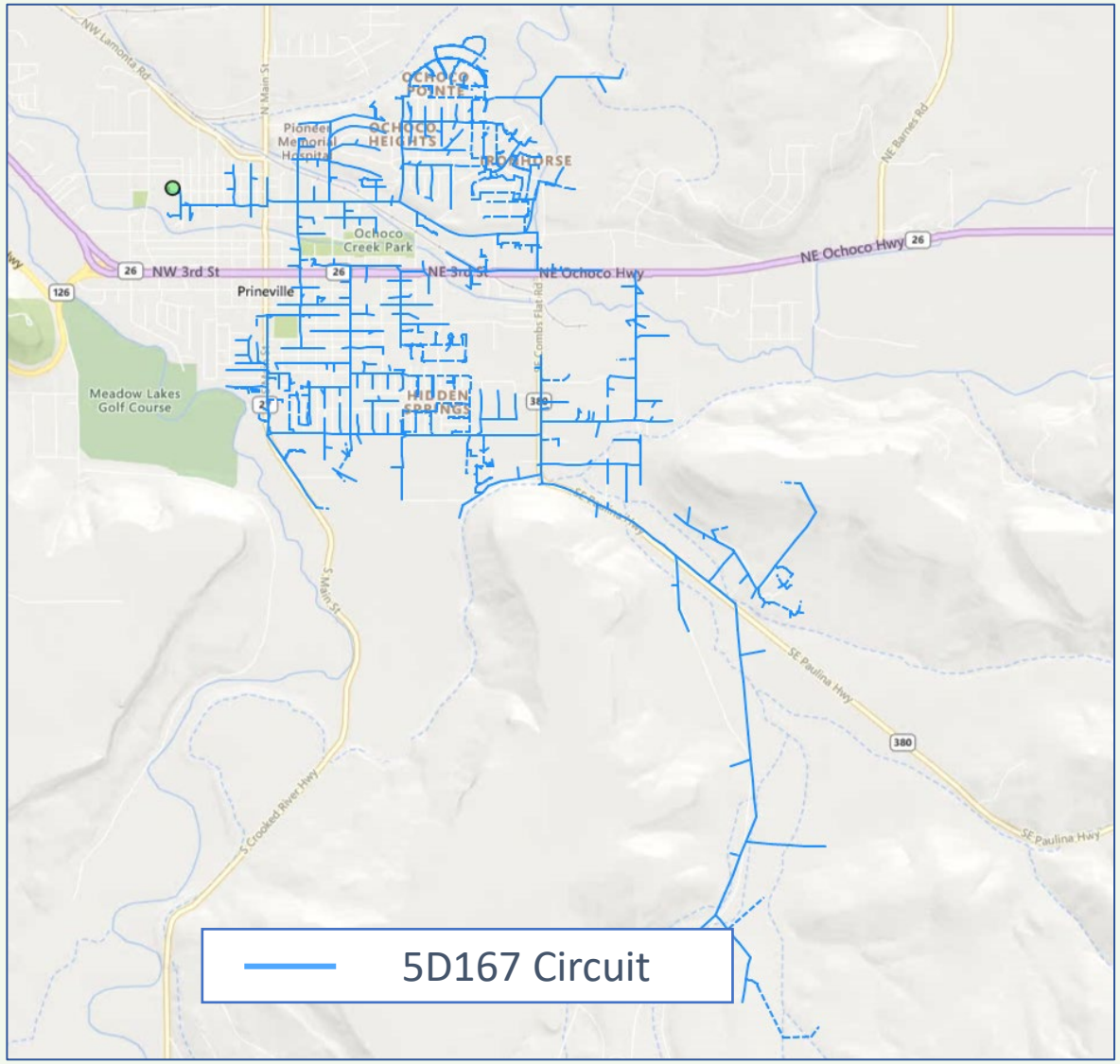
5D167 - Location and Characteristics

Southeast/central quadrant of Prineville

Includes downtown and area running down SE Paulina Hwy into Juniper Canyon.

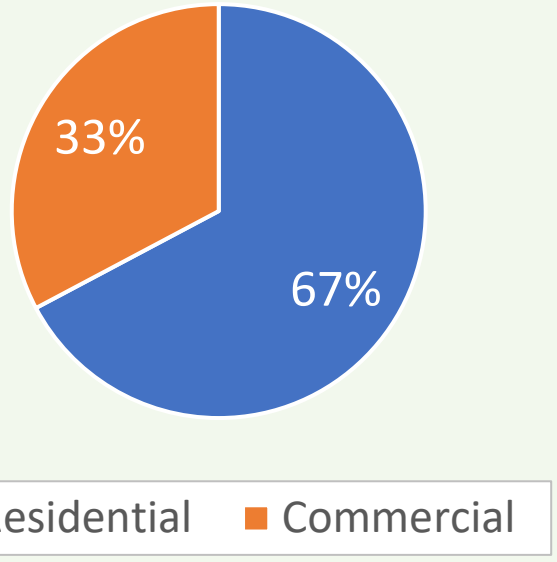
Largest circuit by both load and customers in Prineville.

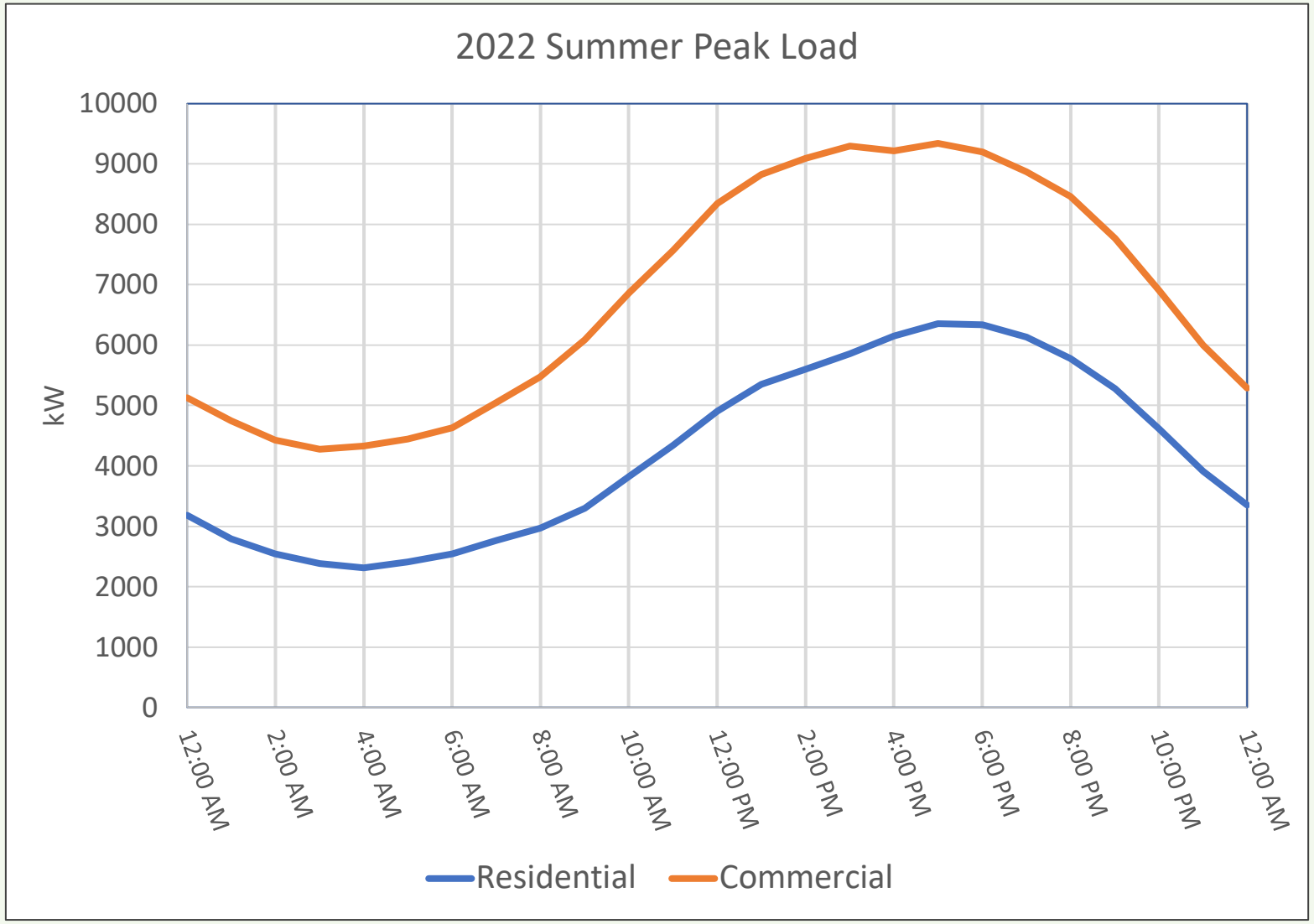
Sector	Meters
Residential	2560
Commercial	296
Industrial	4
Irrigation	5
Total	2865



5D167- 2022 Summer Peak Load

- Record peak summer load occurred on July 29th, 2022 between 5 PM and 6 PM totaling 9437 kW.
- During summer periods, load appears to be driven largely by residential cooling.



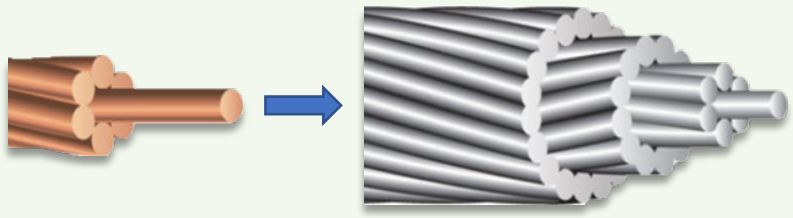


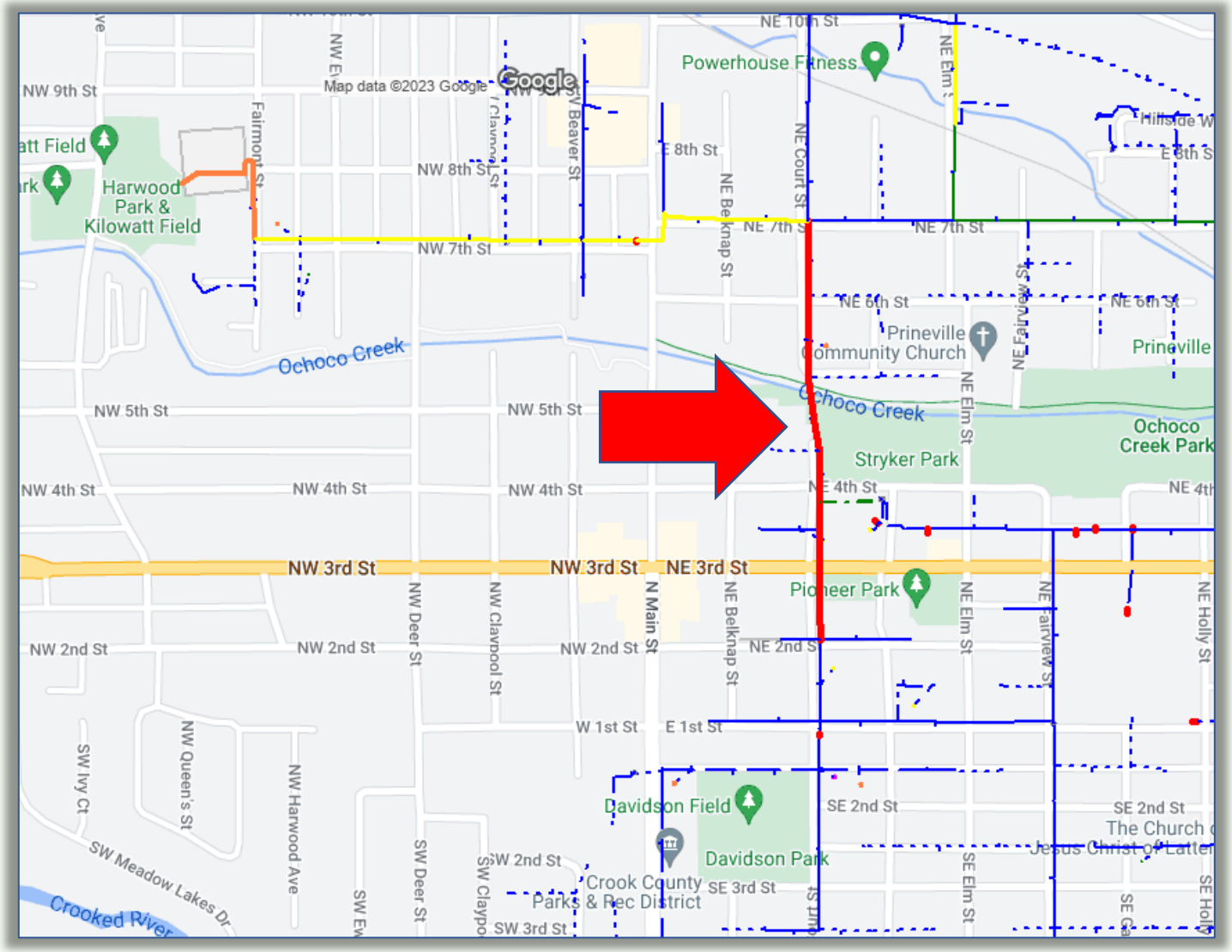
5D167 Grid Need: Overcapacity

Grid need:
Predicted overcapacity during Summer of 2029 on the conductor running south along NE Court St.

Traditional solution:
Upgrade conductor size 1700 ft of 1/0 CU to 477 AAC

Cost estimate:
$108,000





5D167 Grid Need: Circuit Loading Guidelines

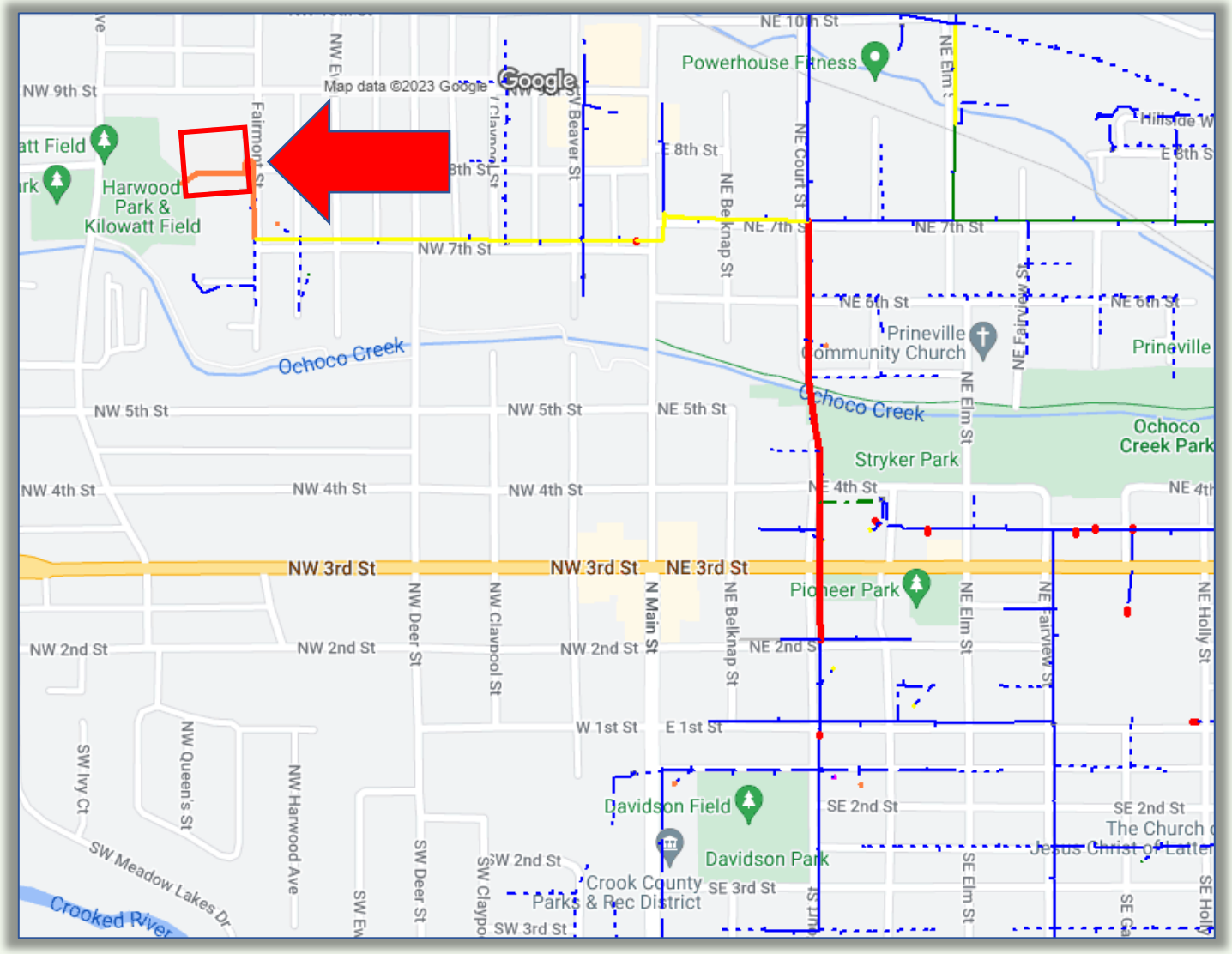
Grid need:
5D167 feeder is projected to exceed 600 Amps in the summer of 2029.
This level of amperage exceeds Pacific Power loading guidelines.

Traditional Solution Option 1:
Load Transfer to 5D25

Estimated Cost:
$30,000

Traditional Solution Option 2:
5D167 divided into two new circuits

Estimated Cost:
$500,000

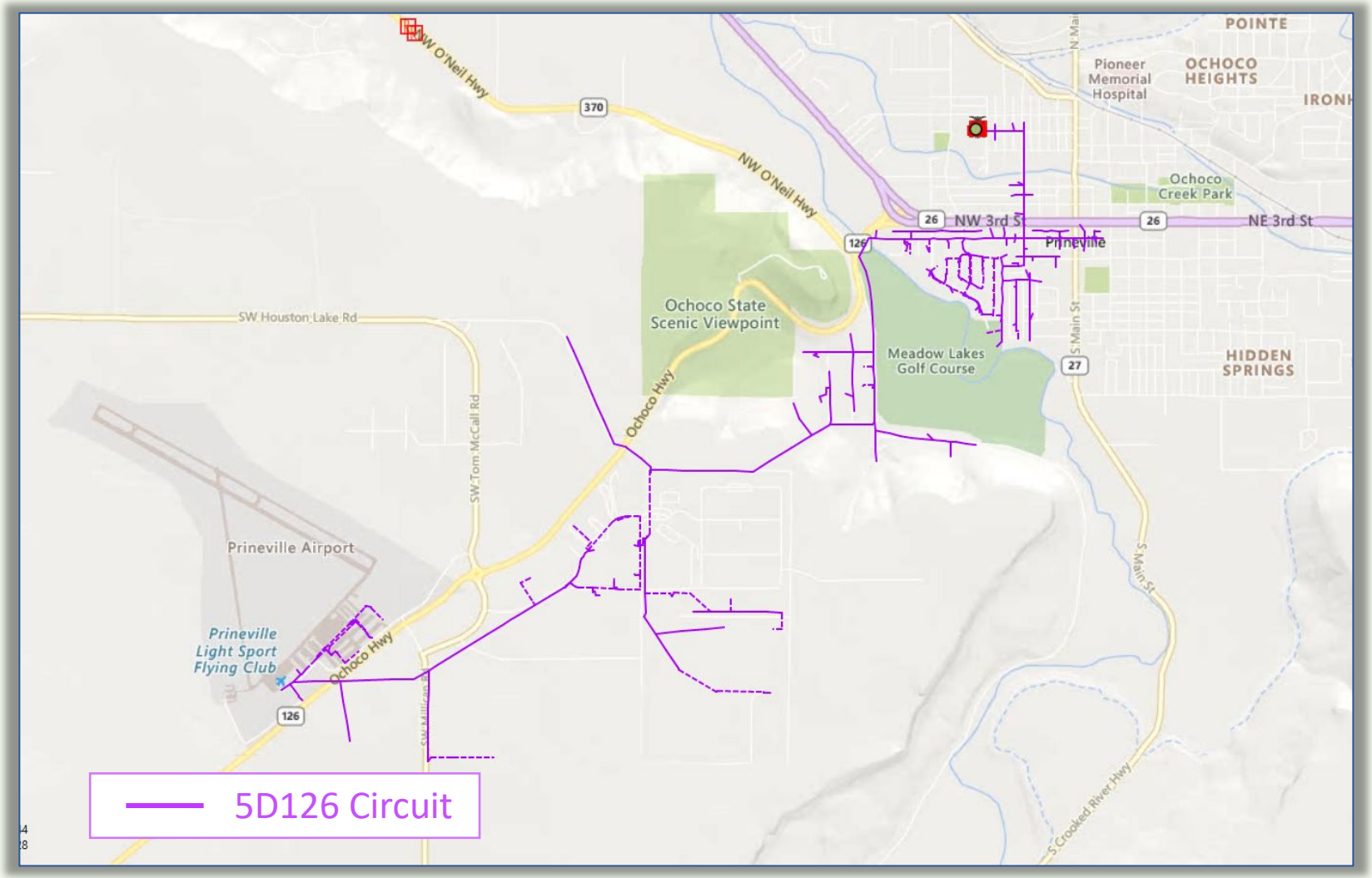


5D126 - Location and Characteristics

Southwest quadrant of Prineville includes:

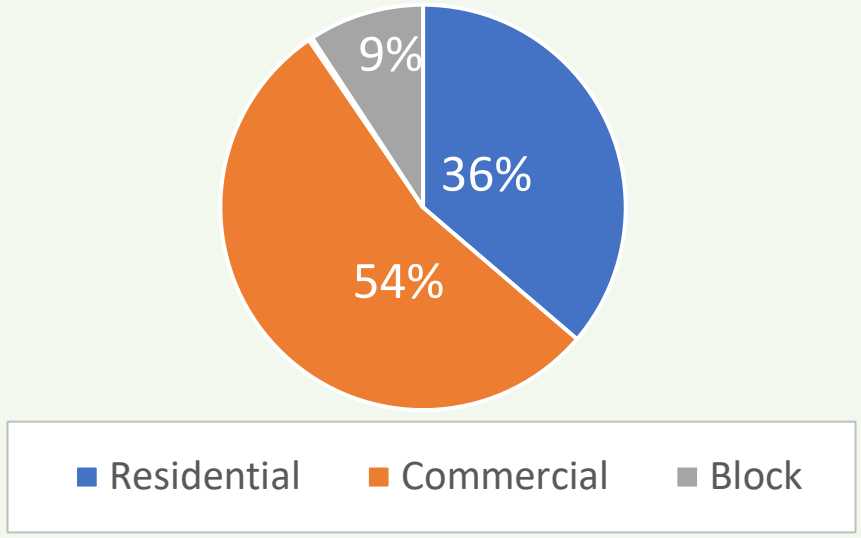
- Prineville Airport
- Meadow Lakes Golf Course
- West 3rd Ave
- Data center office parks

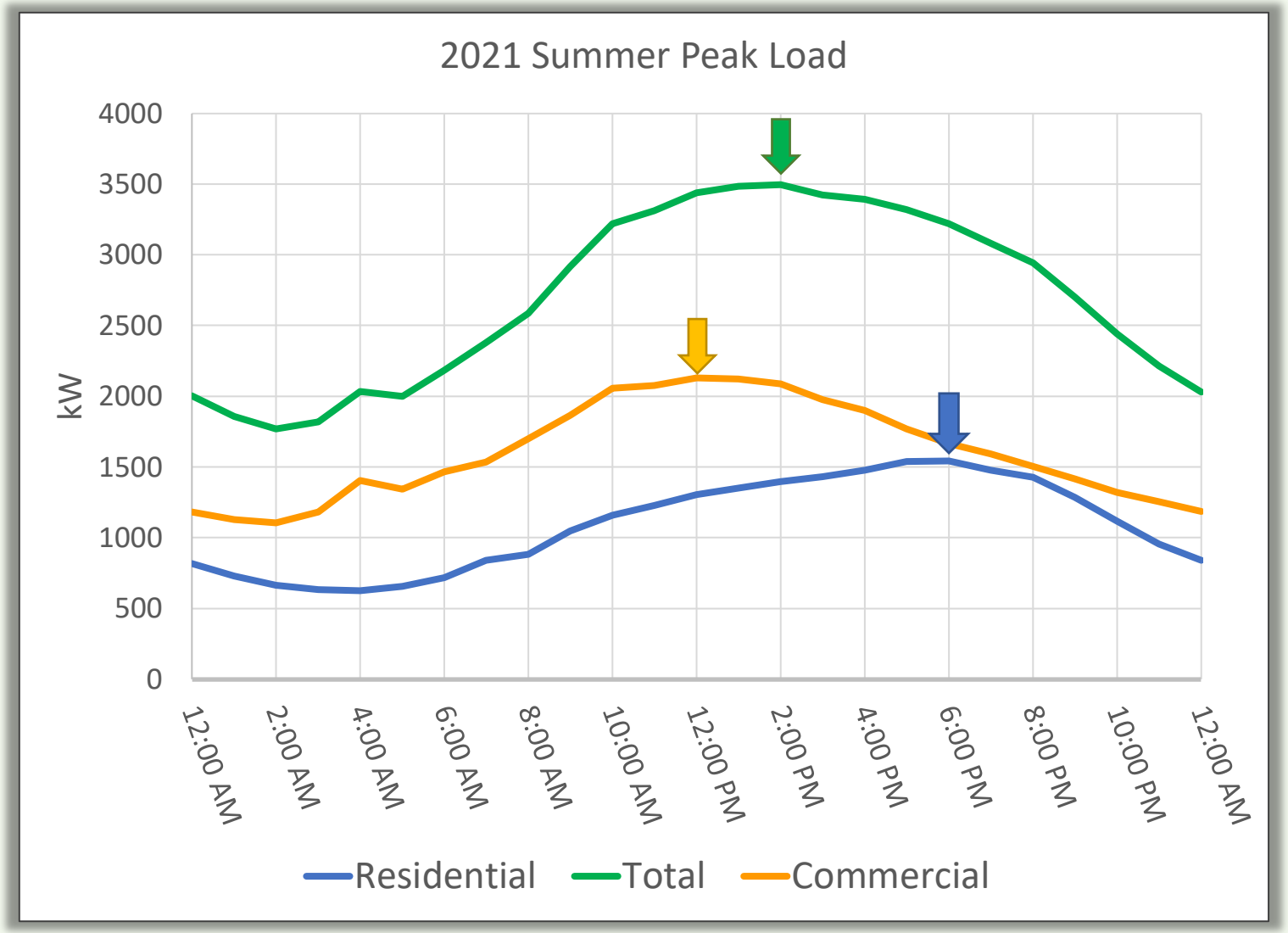
Sector	Meters
Residential	642
Commercial	246
Industrial	1
Block Load	1
Total	890



5D126 – Peak Load Composition

- Predominate load on 5D126 is commercial.
- This shifts traditional evening peak load to the middle of the day and can be offset by solar generation.
- Residential load peaks in the late afternoon when solar generation is much lower.





Commercial Load: Not Just Storefronts

Commercial load can include:

- Storefronts
- Consumer services
- Light industrial manufacturing
- Government facilities
- Non-profit institutions
- Religious institutions
- Medical facilities

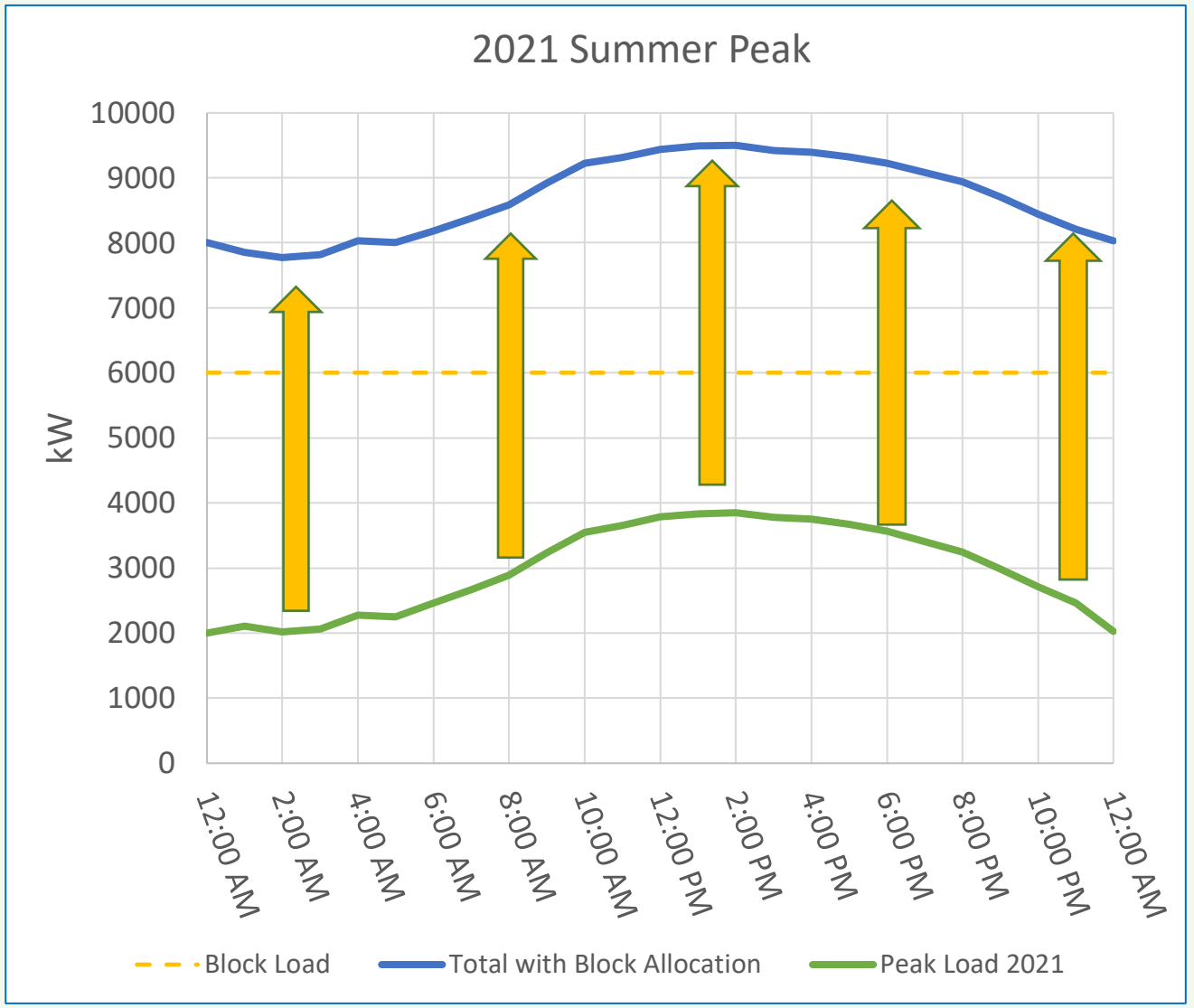
On circuit 5D126, this classification encompasses all but one non-residential account.

5D126 – 2021 Summer Peak with Reserved Capacity

Record peak summer load:

- Occurred on June 29th, 2021 between 2 PM and 3 PM
- Peak load was 3,862 kW
- Load appears to be driven largely by commercial cooling

* 6,000 kW of capacity has been reserved on this circuit and must be kept available for use — the Reserve Capacity

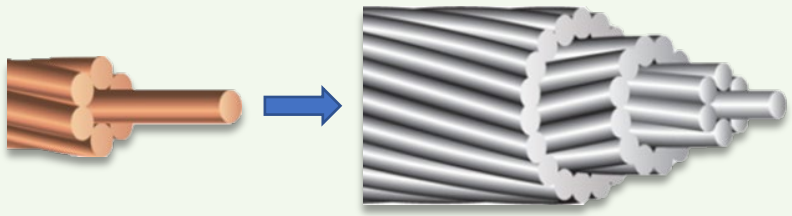


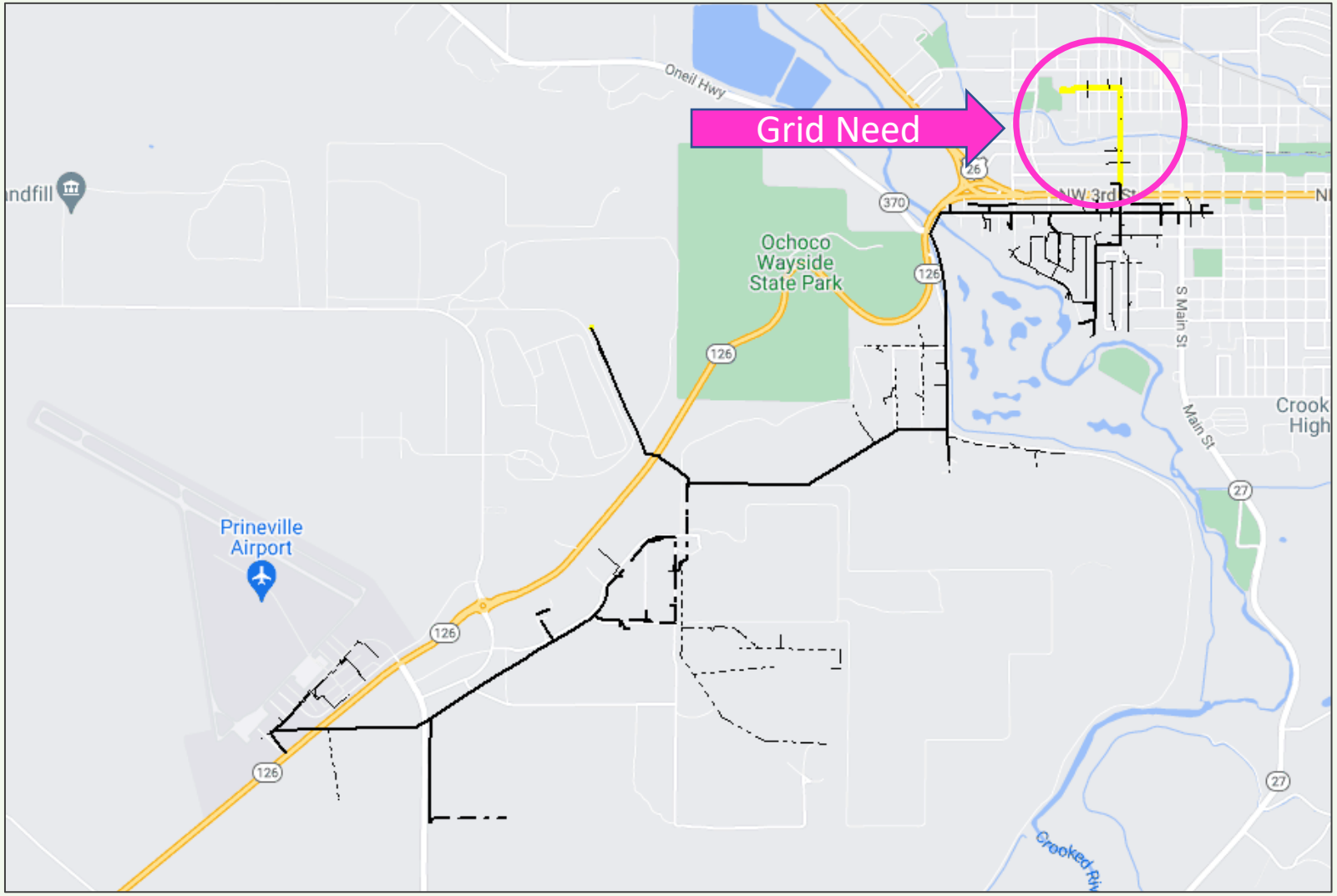
5D126 Grid Need: Overcapacity

Grid Need:
Overcapacity forecasted outside of substation by Summer 2030 which impacts all customers on circuit.

Traditional solution:
Upgrade 3000ft 4/0 CU conductor to 795 AAC

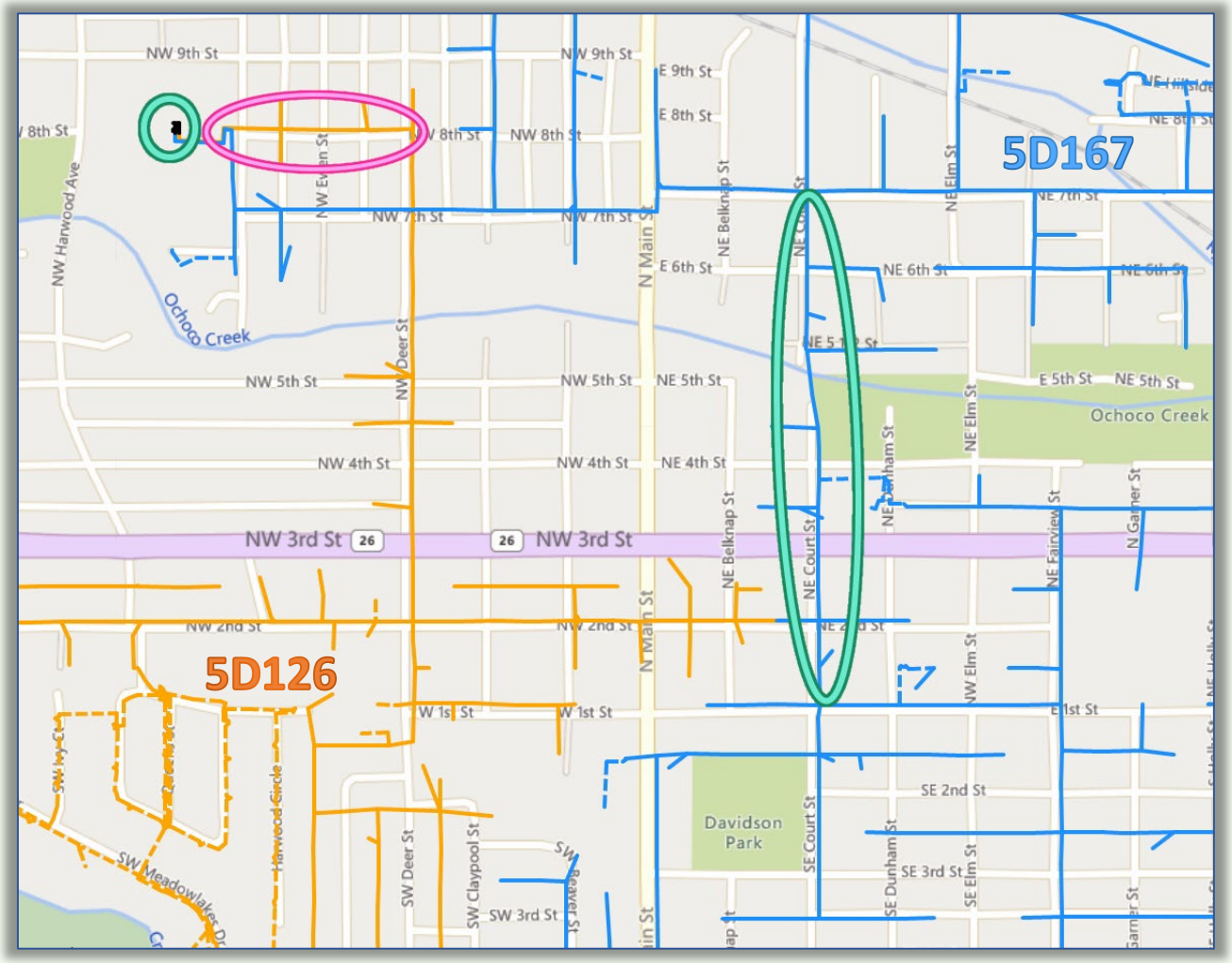
Estimated cost: $450,000





Prineville Grid Needs Summary

Circuit	Grid Need	Year	Candidate for Nontraditional Solution
5D126	Conductor Overcapacity	Summer 2030	**Yes**
5D167	Conductor Overcapacity	Summer 2029	**Yes**
5D167	Circuit Loading Guidelines	Summer 2029	



Nontraditional Solution: Energy Programs

Photovoltaic Solar

- Accelerate commercial adoption

Energy Efficiency

- Targeted energy efficiency to reduce load for grid need
- Commercial and residential

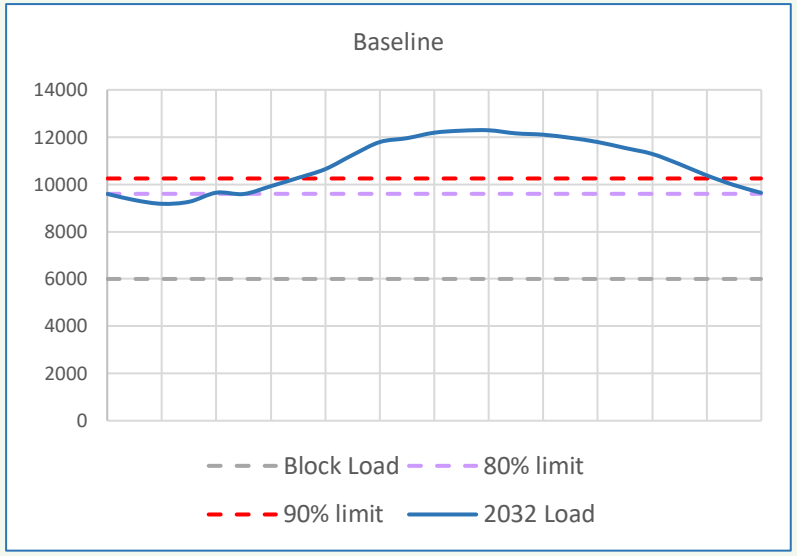
Smart Thermostat and Water Heater

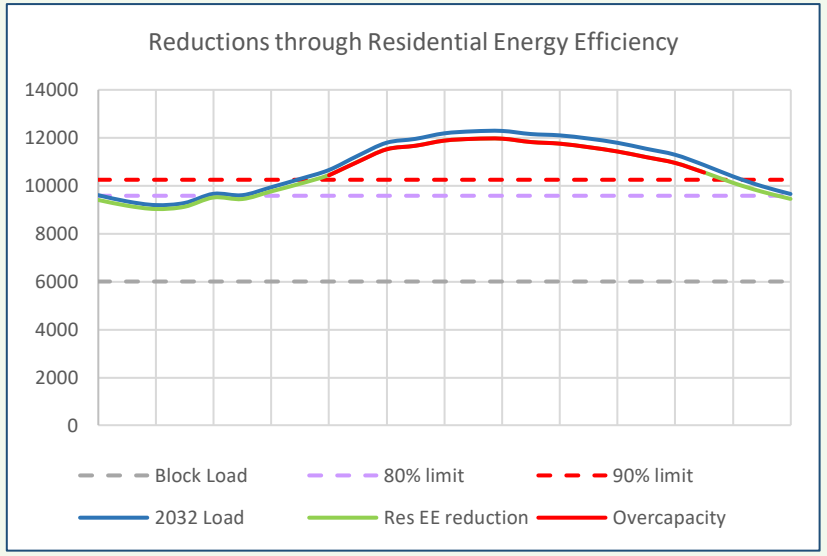
- Develop program to control for distribution grid needs

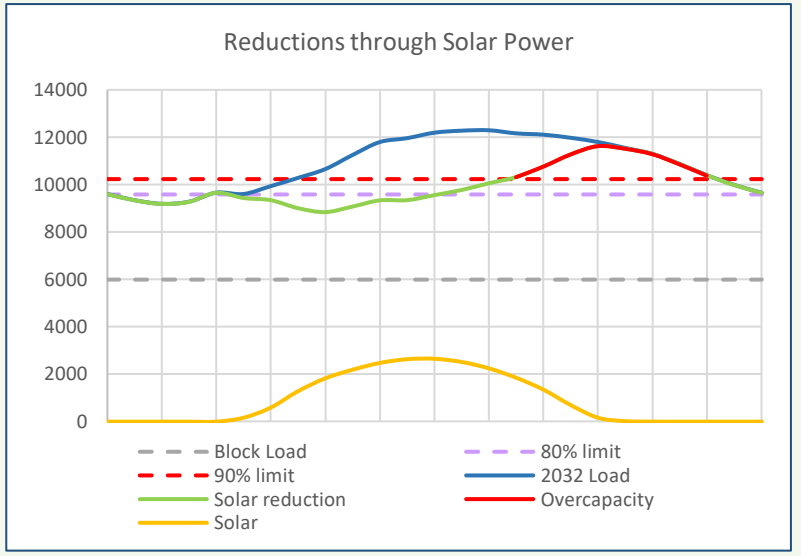
Commercial Demand Response

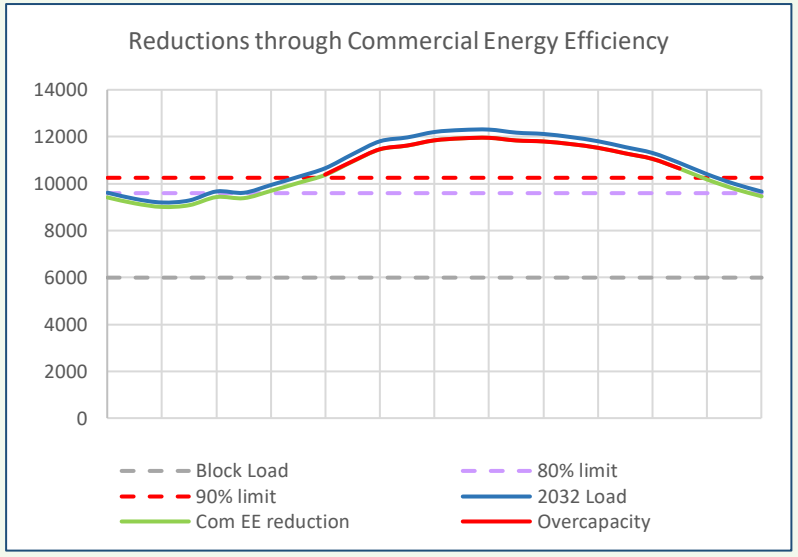
- Partner with customers that have large commercial loads

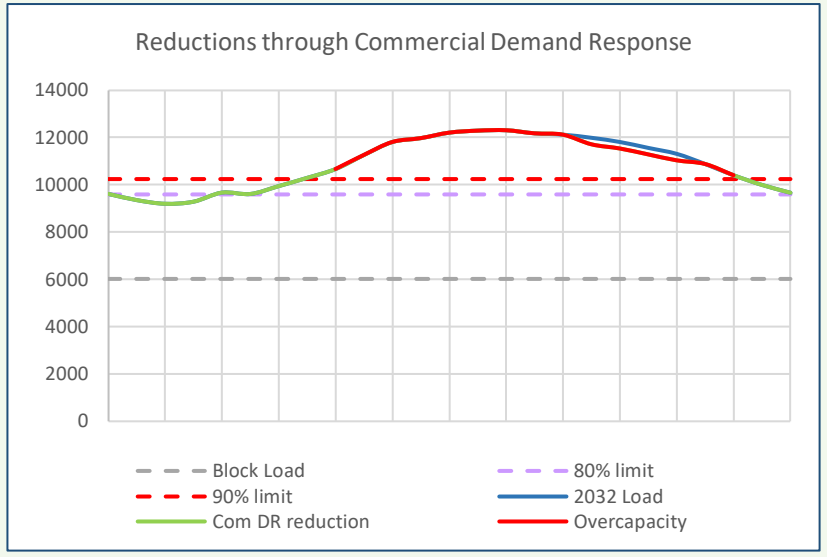
Individual Program Load Reductions

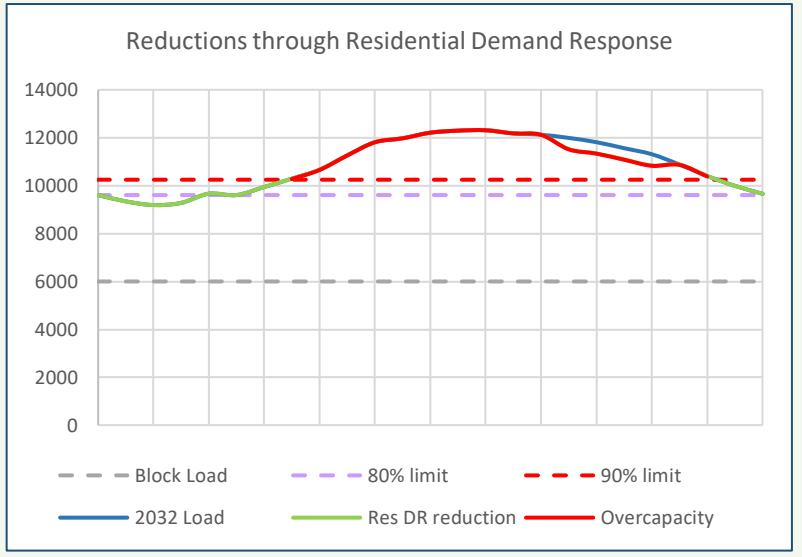








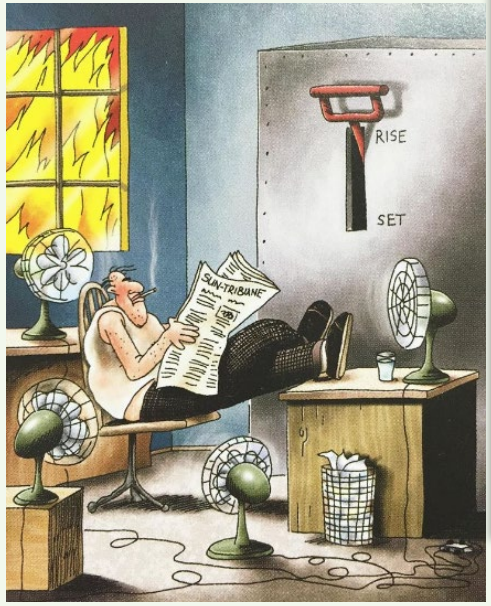


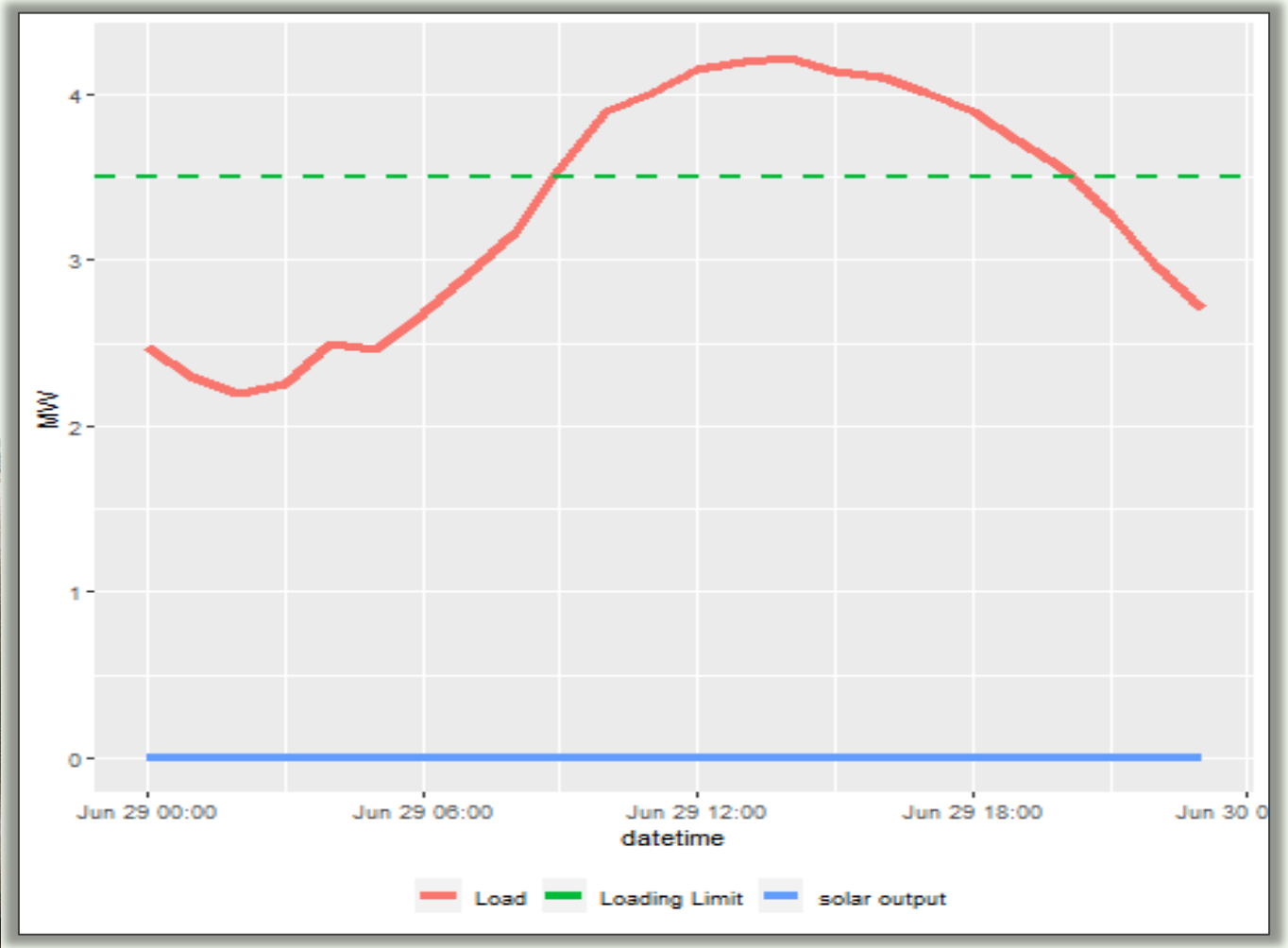


Solar Output for 5D126

As solar increases the peak on 5D126 is reduced.

However, the duration of the grid need extends beyond the time solar is effective.





5D126 in 2032: One Scenario

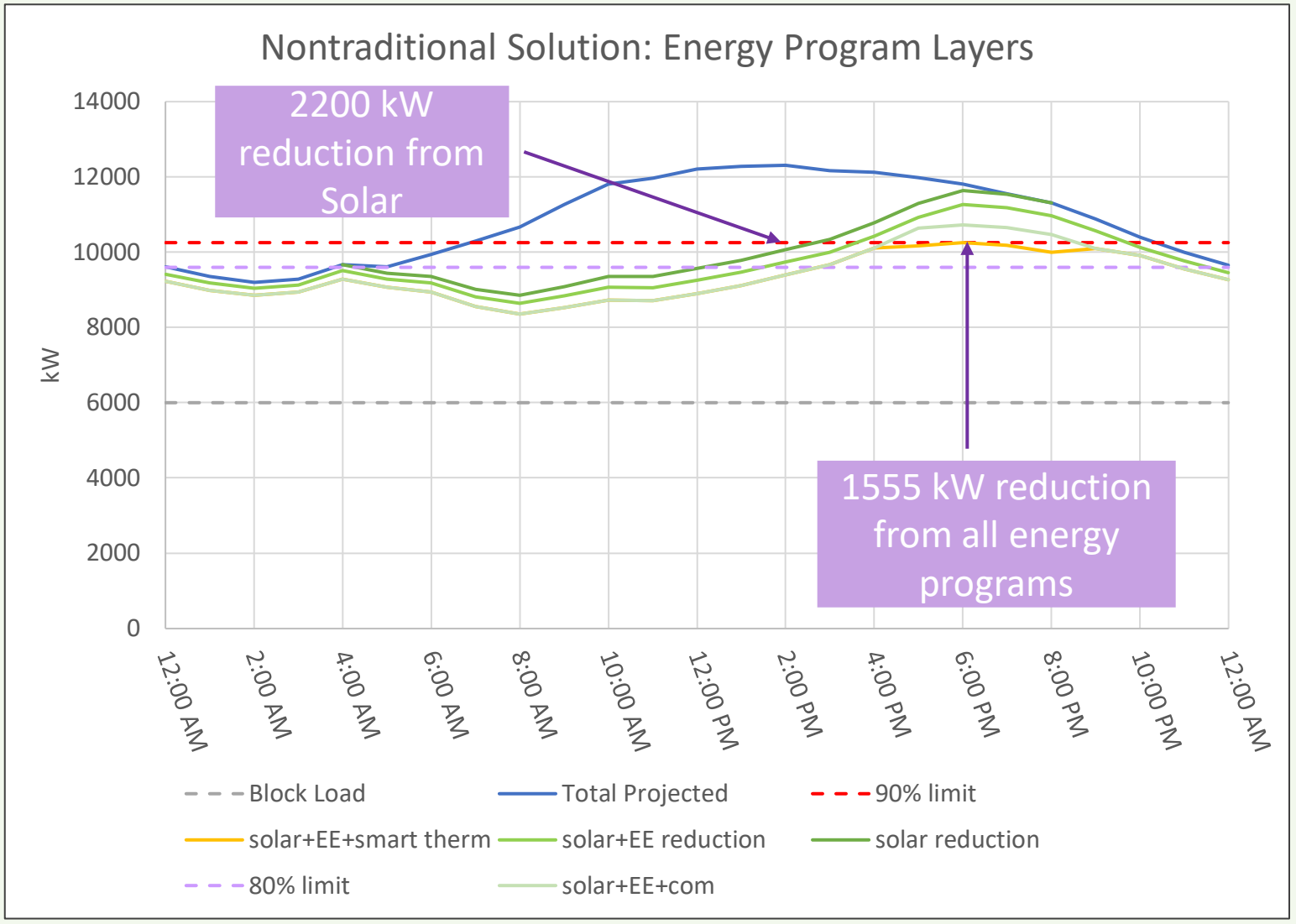
Multiple energy programs required to reduce demand for duration of grid need

Grid Need Duration: 7AM-10PM

7AM-2PM
3MW installed solar pv reduces loading below 90% capacity until 2PM

2PM-10PM
Additional programs required to reduce loading after 2PM. 6PM has greatest need for additional reductions.
1555 kW overall Reduction required

Power demand is reduced to 90% of wire capacity.



What is Residential Energy Efficiency?

Based on national reporting from ACEEE's utility scorecard, a 3% annual reduction is difficult, but achievable

Core Measures:

Heat Pumps

Insulation

Windows

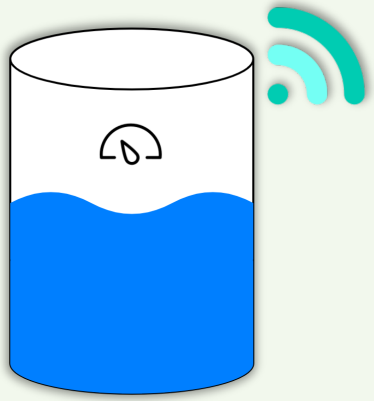
Additional Measures:

Manufactured Home Duct Seal and Repair

Energy-Efficient Appliances

LED Lighting

Pacific Power's Optimal Time Rewards - Coming Fall 2023



How it works

Pacific Power adjusts the temperature of customer thermostat and/or the water heater's power to help address grid needs.

Incentives

Sign up to receive $25 for a smart thermostat and/ or water heater AND $25 each year for each product continued participation.

http://PacificPower.net/OptimalTimeRewards

Commercial and Industrial Demand Response –Live Now

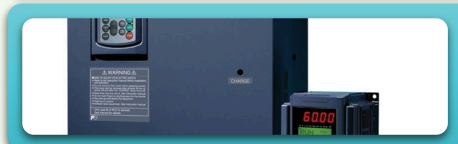
- Newer approaches based on granular data analysis can provide more distribution-level solutions
- Commercial and Industrial customers agree to curtail load during peak events in exchange for financial incentives
- Incentives available, vary by:
  - average available load for curtailment during product hours
  - advance notification

http://PacificPower.net/CIDR

Commercial Energy Efficiency

Commercial Energy Efficiency incentives are highly dependent on industry. Some of the most popular and/or effective incentives:

Retrofitting/enclosing freezers and refrigerated cases



Installing variable frequency drives (VFDs) on fans and motors

Replacing existing fluorescent/incandescent light bulbs with LEDS or daylighting

Replacing conventional cooling/heating equipment with heat pumps

Inverter-driven welders

Forklift battery chargers

How do we get there?

Marketing

Pilot Programs

Grant Connections

Smart Networks

Increased Incentives

USDA Rural Energy Assistance Program

United States Department of Agriculture

Guaranteed USDA loans for eligible applicants with guarantee amount up to 80%

Grants available for up to 25% of project cost

Agricultural Producers and Rural Small Businesses are eligible for this program

All geographical areas within and around Prineville are classified as rural, and are eligible for this program

Funds may be used for renewable energy systems and for energy efficiency improvements.

$1 million dollar maximum loan for renewable energy
$500,000 dollar maximum loan for energy efficiency

Next Steps

Energy Trust of Oregon Study of Target Areas

Meetings with Local Large Load Customers

Development of Preliminary Plans/Programs

Next Steps/Open Discussion

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Conclusion:

We have identified grid needs in this study area and believe there are opportunities for some of the needs to be addressed with nontraditional solutions. The feedback we have received today, and further study will guide our project proposals.

Nontraditional solutions should be cost effective and benefit all parties. Thank you for engaging in the discussion today.

Questions/Comments?

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Online Participants Questions/Comments?

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Local Workshop #2 Survey

https://forms.office.com/r/ahSenKaZif

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Additional DSP Information

DSP Email / Distribution List Contact Information

- DSP@pacificorp.com

DSP Webpages

- Pacific Power Oregon DSP Website
- Planificación del Sistema de Distribución de Oregón (pacificorp.com)

Additional Resources

- PacifiCorp's DSP Part 1 Report
- PacifiCorp's DSP Part 2 Report
- DSP Pilot Project Suggestion Form
- PacifiCorp Wildfire Mitigation Plans
- Energy Trust of Oregon