Distribution System Planning
Public Workshop #5
September 24, 2021






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Workshop #5 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,,532145822# United States, Davenport

  Phone Conference ID: 532 145 822#

- **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.

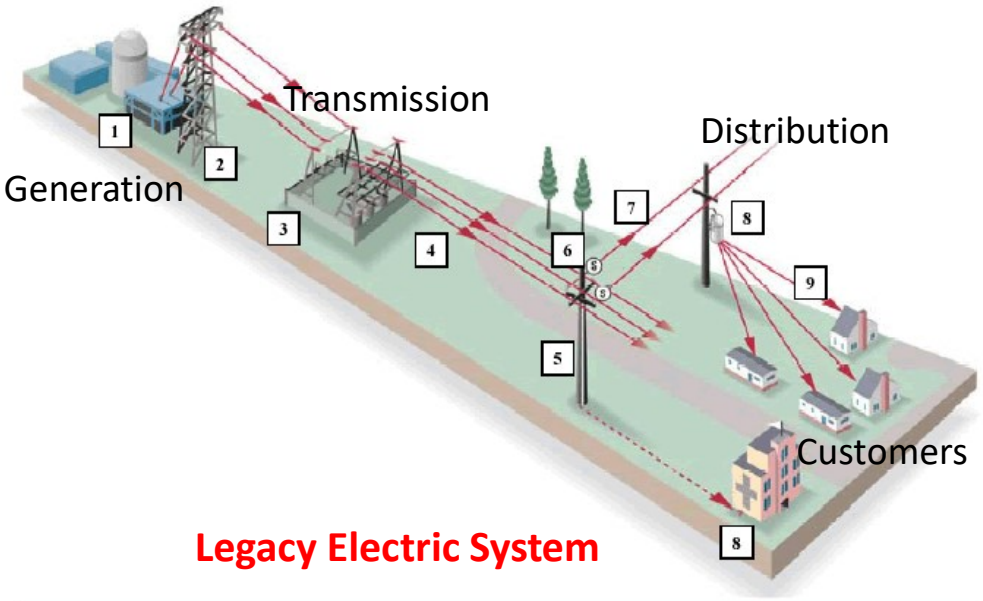
Today's Goals

- Introductions
- Progress to date
- Integrating IRP components with DSP process
  - Timing of inclusion of measures from DSP into resource view with IRP
  - Load bubble discussion
  - Load forecast is a key connector between the two plans
  - Forecasts that are external or new & novel to the legacy system (i.e. private generation, transportation electrification) and their inclusion into future IRPs and impact DSP
  - Disaggregation of resources by time/load-shape, location, resource type
  - Integration of stakeholder feedback into legacy planning processes and the roadmap toward PacifiCorp's DSP vision
  - Anticipation of grid planning goals (particularly related to clean energy adoption) within IRP process and DSP processes
- Display of certain GIS viewer
- Upcoming
  - *Filing of draft plan on October 15, 2021*

Progress To Date

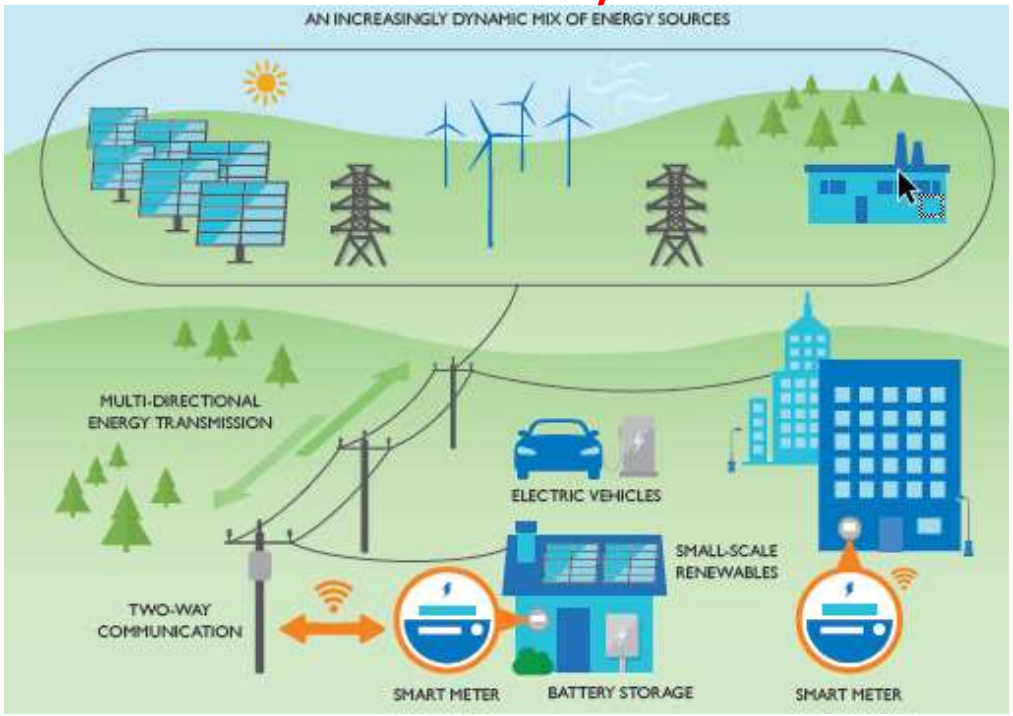
- ✓Four workshops held
- ✓Developed and shared initial baseline info and finalized template spreadsheet
- ✓Continue to reached out to parties with whom we engage regularly to invite them to the process
- ✓Draft community engagement plan being shared
- ✓Building roadmap for short term and long-term plan regarding DSP essentials

Reminder Visual: Electric Utility...current & future



Legacy Electric System

Future Electric System



Integrating DSP & IRP



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The Integrated Resource Planning Process

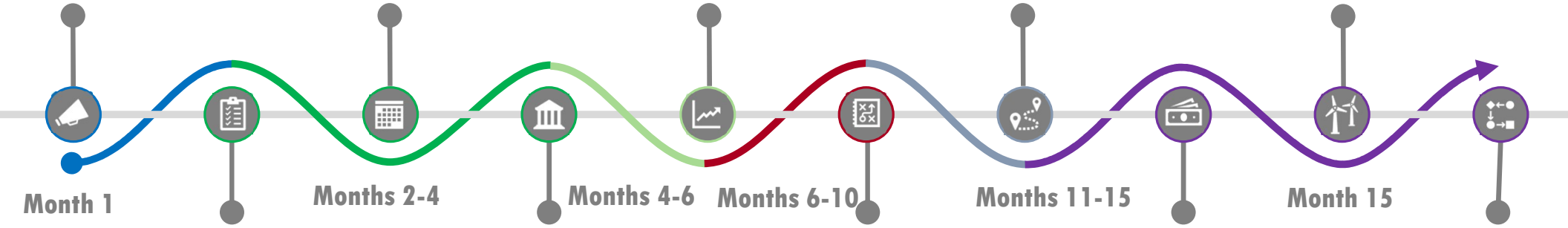
- Notify the public and stakeholders of development process

- Set up the analytic tools and present modeling process

- Update data used for the analysis

- Analytic modeling and portfolio development

- Complete IRP document



- Identify opportunities for conservation and demand response

- Plan for new energy policy and requirements

- Discuss inputs and modeling assumptions

- Selection of a least-cost, least-risk preferred portfolio

- File IRP

PacifiCorp seeks, receives, and incorporates public feedback throughout the IRP development cycle

Learn more about our 2021 IRP at www.pacificorp.com/irp

IRP integration into DSP: Now & Future

Load Forecast

- Load is forecast at jurisdictional level
- Private generation and energy efficiency (PG & DSM) are forecast and decremented from jurisdictional load
- Jurisdictional load is apportioned into load bubbles based on substation percentages

Substation Forecast

- Substation forecasts are updated annually
- Substations are aggregated into bubbles based on transmission constraint considerations
- Bubble percentages are calculated as the proportion of substation load in the bubble to total substation load in jurisdiction
- Annual coordination to ensure bubbles and their forecasts align with substation-level forecasts

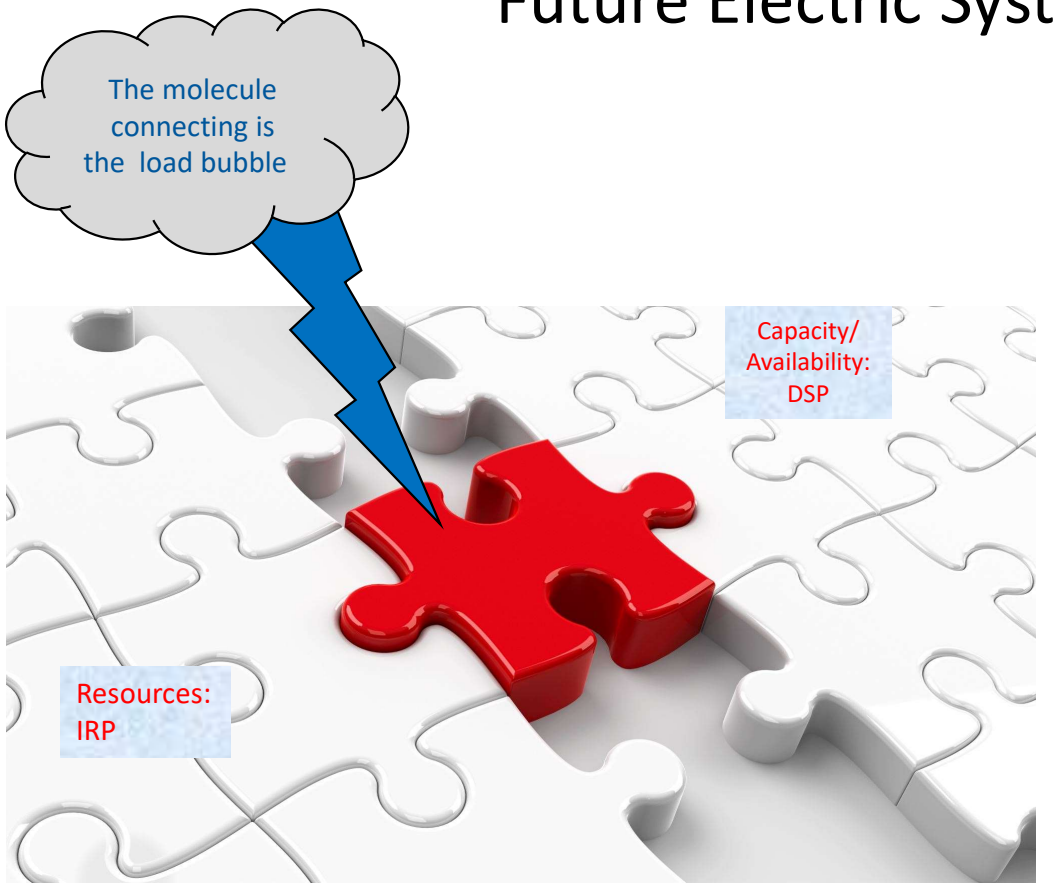
Distribution Planning

- Distribution capacity is evaluated at the circuit level for relevant scenarios (recent circuit peak events, extrapolated with circuit growth added)
- Distributed generation does not play a substantial role in adding to circuit capacity planning except as a reduction in circuit peak similar to the way DER impacts are incorporated

Future Electric System Puzzle Pieces

IRP

- IRP focuses on long-term resource and transmission need
- A variety of long-term peak forecast scenarios analyzed
- Forecasted load is divided into transmission constrained areas or bubbles as input to IRP

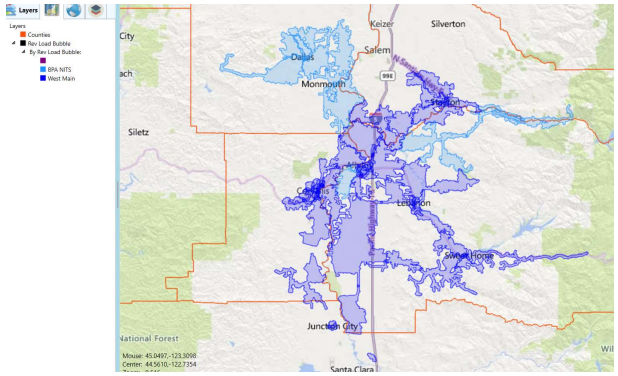


Distribution Planning

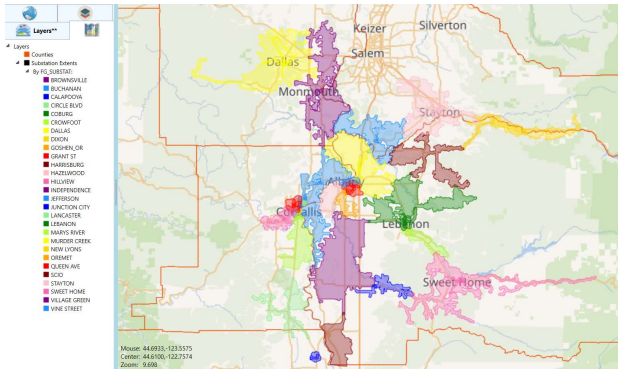
- DSP focuses on capacity of wires very locally
- A variety of scenarios used during which capacity is most tested, such as usage peaks and light loading cases
- Establishes need for quantification of load at risk and contingency or long term plans

Granularity differs depending on the goal

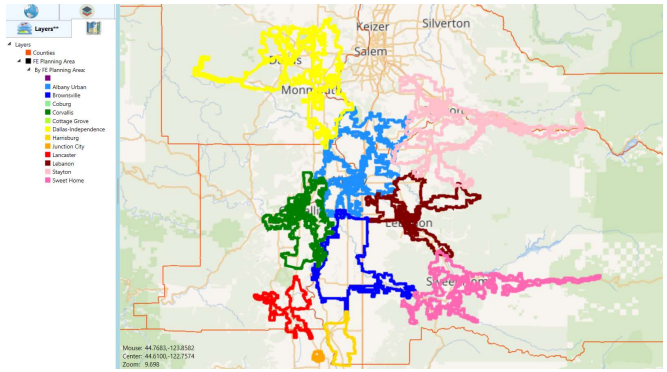
Load Bubble: Resources delivered via bulk system



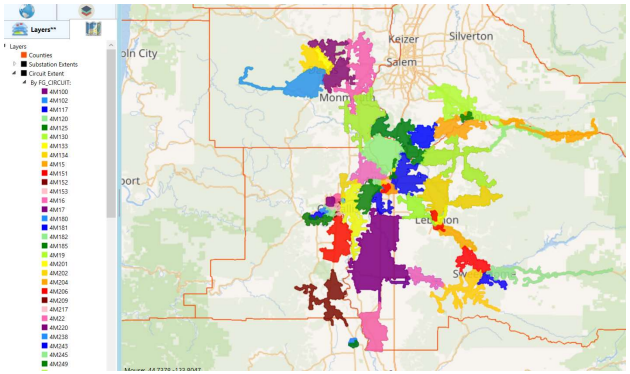
Substation Coverage Area: Substation loading and circuit load transfer capacity



Distribution Planning Area: Community level capacity planning and enhancement



Circuit Extents: Circuit loading



IRP and DER Forecasts

Distributed Energy Resources (DERs) are forecast by State for each IRP cycle. DER forecasts for the IRP include:

- Private Generation Forecast
- Conservation Potential Assessment
- Electric Vehicle Adoption Forecast

Principles for DER forecasting

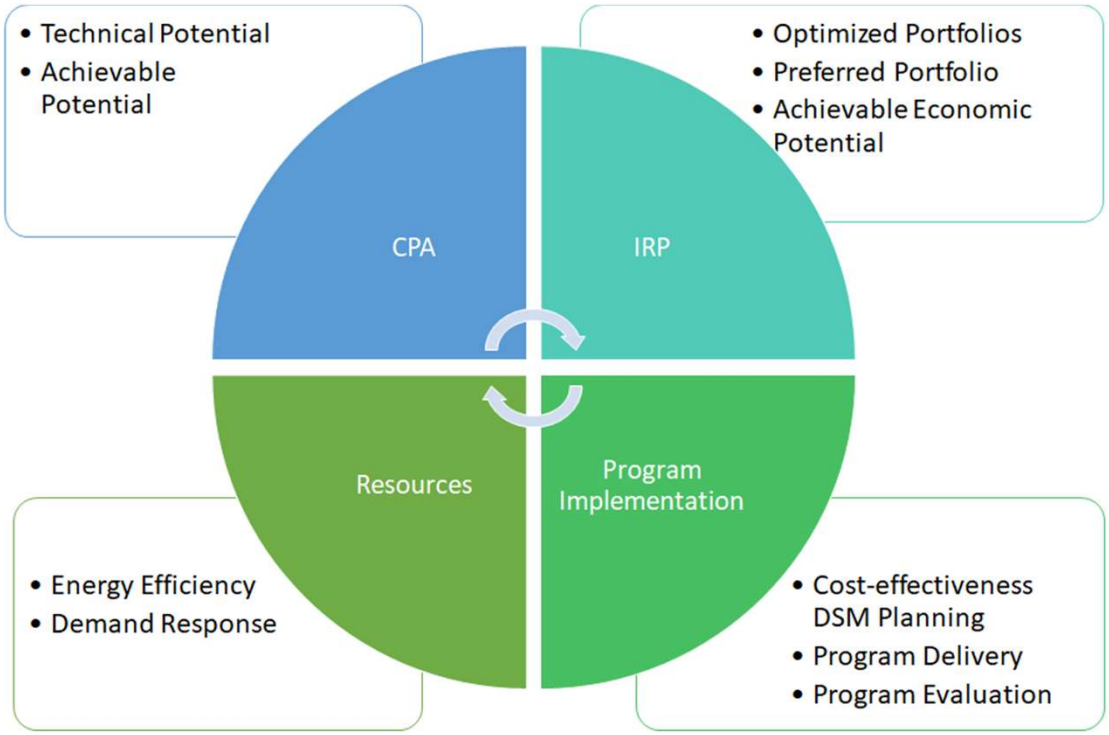
1. To the extent possible, planning estimates should strive to be consistent between IRP and DSP.
2. To the extent possible, timing and location of DER impacts should strive to align with load forecast.
3. Methods for disaggregating forecasts to the distribution system level should be an iterative improvement process. Refining and seeking new data inputs as gaps are identified and solutions developed.

Conservation Potential Assessment

Covers demand side management resources by State[2]:

1. Demand response (DR, Class 1)
2. Energy efficiency (Class 2) provided by Energy Trust of Oregon

- Energy efficiency and demand response resources are incremental to existing resources. Selected DSM is deducted from load forecast.
- Resources are bundled into net cost bins accounting for energy, capacity, and ancillary benefits. Resources are selected based on least cost and least risk for the portfolio.
- Selections are currently at the State and sector level.
- Plan to work with the Energy Trust of Oregon to explore methods to disaggregate energy efficiency forecasts for Distribution System Planning.
- Current DR is small but will expand in the future. Careful consideration will be given to match program design characteristics to forecasted impacts and vice versa.



[2] https://www.pacificorp.com/energy/integrated-resource-plan/support.html

Private Generation Forecast

Current Status

- Conducted early-on in the IRP process the private generation study[1] forecasts adoption of renewable generation by PacifiCorp customers.
- Assesses technical potential for customer generation and relies on underlying customer economics to determine penetration of renewable technologies over the forecast period.
- The forecasted on-site customer generation is then deducted from the load forecast prior to IRP modeling.

Future Plans

- Upcoming study will include stand alone batteries and co-located batteries in the forecast (since the 8,760 load shape differs). It will also require selected contractor to disaggregate results to the feeder level in Oregon for use in distribution system planning.
- Reconciliation between state level private generation disaggregated into sub-load bubbles versus aggregation from feeders into sub-load bubbles will be required and will be a new process.

[1] https://www.pacificorp.com/content/dam/pcorp/documents/en/pacificorp/energy/integrated-resource-plan/2021-irp/2021-irp-support-and-studies/PacifiCorp_2021_IRP_PG_Resource_Assessment.pdf

Electric Vehicle Forecasts

PacifiCorp relies on national forecasts of EV adoption from the three industry sources. National EV market growth rates from each source are applied to the last year of known vehicle adoption.

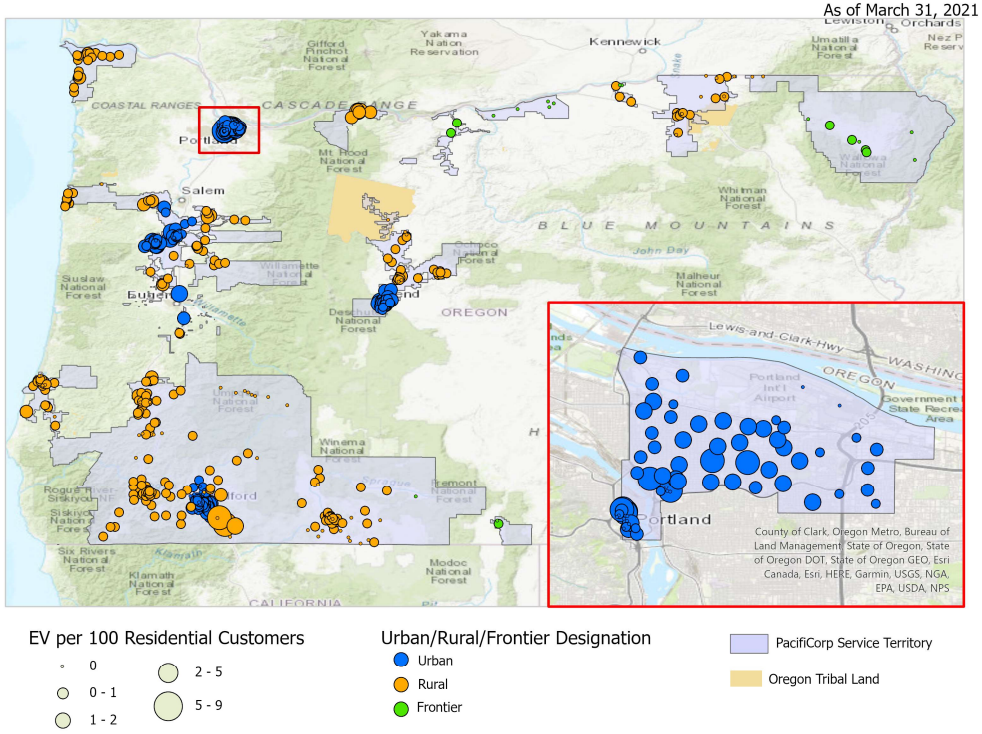
Statewide forecast covers load impacts for light, medium, and heavy-duty vehicles. Forecast is regression-based model that uses current adoption rates and EV growth assumptions from industry sources to estimate future EV adoption. Medium to heavy duty vehicles are early in adoption curves making predictability a challenge.

Some electric vehicle load is already embedded within the load forecast. The EV forecast is adjusted to include future incremental EV load.

Allocated current vehicles to feeder based on geographical data from the Oregon Electric Vehicle Dashboard. Methodology for forecasting is underway. Regression based model is likely to continue at least for light duty vehicles. Currently investigating the incorporation of other key drivers of electric vehicle adoption and ensuring disaggregated totals match statewide totals.

Electric Vehicle Registrations by PacifiCorp Feeder

As of March 31, 2021

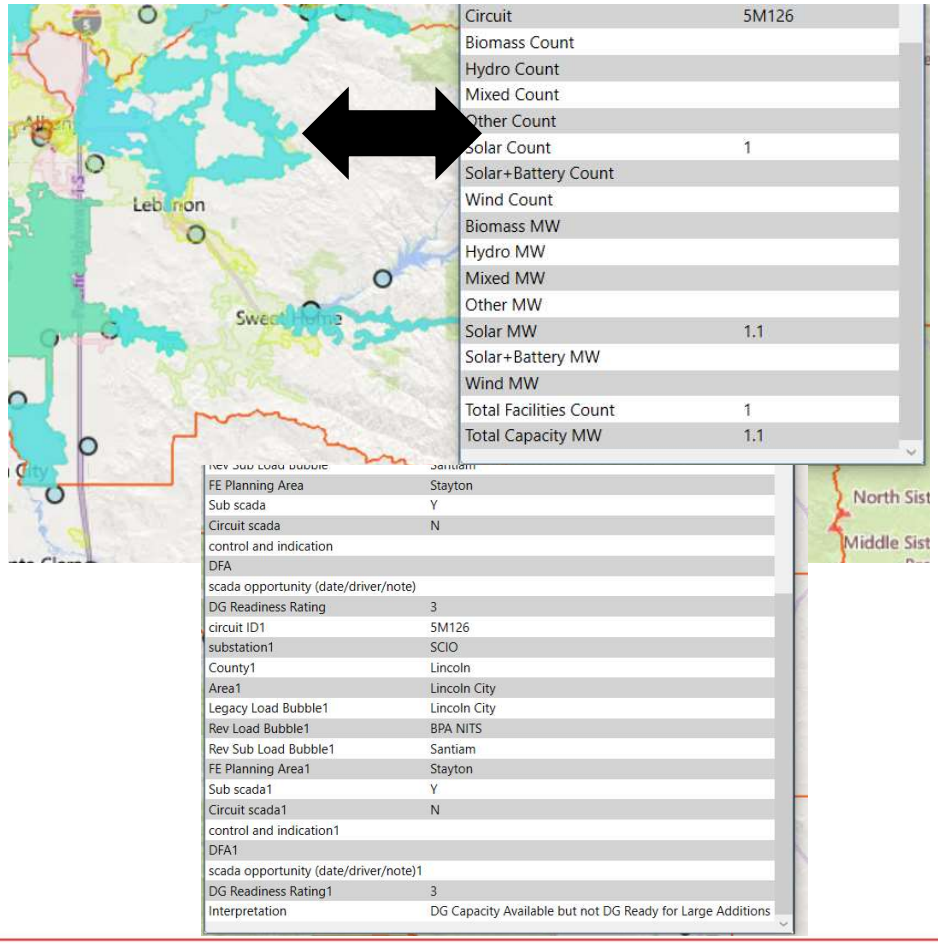


Geospatial Data Representation

Preparing a wide variety of GIS viewer thematics

Shown to the right is our draft representation of DG placed and in queue (not separated in this graphic), as well as depiction of the “readiness” and availability of capacity on the circuit

Working on energy equity data as well as producing some of the baseline spreadsheet content



Circuit	5M126
Biomass Count	
Hydro Count	
Mixed Count	
Other Count	
Solar Count	1
Solar+Battery Count	
Wind Count	
Biomass MW	
Hydro MW	
Mixed MW	
Other MW	
Solar MW	1.1
Solar+Battery MW	
Wind MW	
Total Facilities Count	1
Total Capacity MW	1.1

FE Planning Area	Stayton
Sub scada	Y
Circuit scada	N
control and indication	
DFA	
scada opportunity (date/driver/note)	
DG Readiness Rating	3
circuit ID1	5M126
substation1	SCIO
County1	Lincoln
Area1	Lincoln City
Legacy Load Bubble1	Lincoln City
Rev Load Bubble1	BPA NITS
Rev Sub Load Bubble1	Santiam
FE Planning Area1	Stayton
Sub scada1	Y
Circuit scada1	N
control and indication1	
DFA1	
scada opportunity (date/driver/note)1	
DG Readiness Rating1	3
Interpretation	DG Capacity Available but not DG Ready for Large Additions

Next Steps

- Schedule
  - Distribution System Plan (Part 1) to be filed on October 15, 2021

Question & Answer



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Closing






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Additional Information

- DSP Email / Distribution List Contact Information
  - 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!






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