

Idaho Power: Getting to Know Our Distribution System



DSP – Public Meeting #1

August 26, 2021

Welcome!



Thank you for attending the initial workshop for
Idaho Power Company's
Distribution System Planning (DSP) Process

Agenda



- Quick Background: Why Are We Here?
- Introductions
- Power Grid 101
- Eastern Oregon Distribution System
- Planning Processes
- Distribution System Planning

Ground Rules



- Post comments and questions in the chat
- Please feel free to speak up and engage throughout
- Please keep discussion civil and respectful
- Take comments with positive intent

Man with curly hair about to dive into the water



Man with curly hair about to dive into the water



Balanced Input



Introductions



In the chat, please send us:

- Name
- Organization
- What are you most interested in learning about in these workshops?

You can also send us more information at DSP@idahopower.com

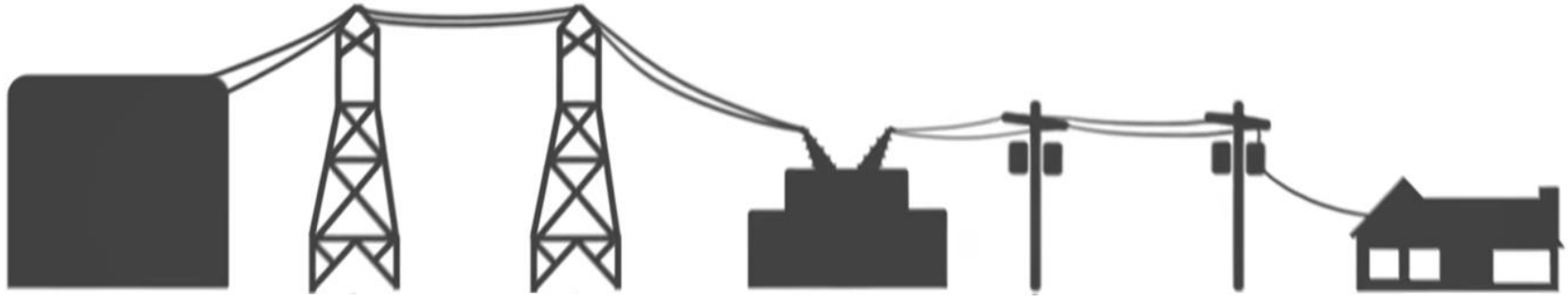
Idaho Power Team

Name	Position	Name	Position
Jared Ellsworth	Transmission, Distribution & Resource Planning Director	Angelique Rood	Regional Manager
Jim Burdick	Distribution Planning Engineering Leader	Dena McFarlin	Regional Customer Relations Manager
Marc Patterson	Transmission & Distribution Strategy Engineer	Mike Ybarguen	Economic & Community Development Advisor
Chris Cockrell	Distribution Planning Engineer	Danielle Ready	Education & Outreach Energy Advisor
Tyson Kent	Distribution Planning Engineer	Rodolfo Beltran	Key Account Energy Advisor
Alison Williams	Regulatory Policy & Strategy Advisor Regulatory Affairs	Duane Pearson	Agriculture Representative
Kelley Noe	Regulatory Consultant	Lisa Nordstrom	Legal Counsel

Poll Question



Power Grid 101



Power



The rate at which work is performed:

- Megawatt (MW)

1 MW

Average Day	Hottest Day
650 Homes	300 Homes
Large Box Store	Large Box Store

Capacity

The amount of power an element can handle

- The unit is the same as it is for power (MW)



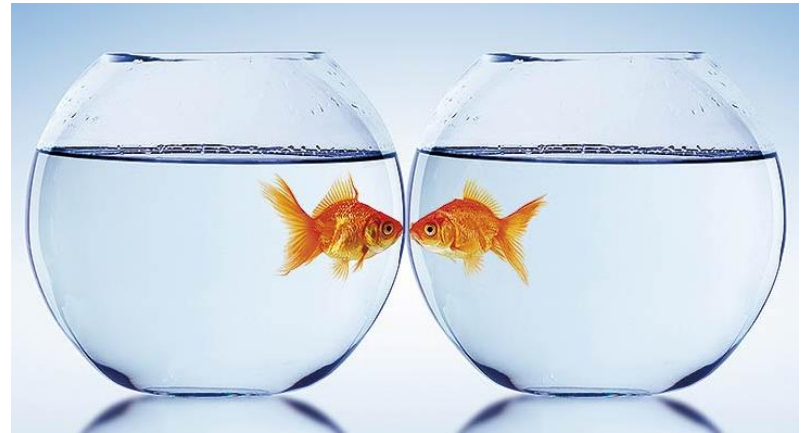
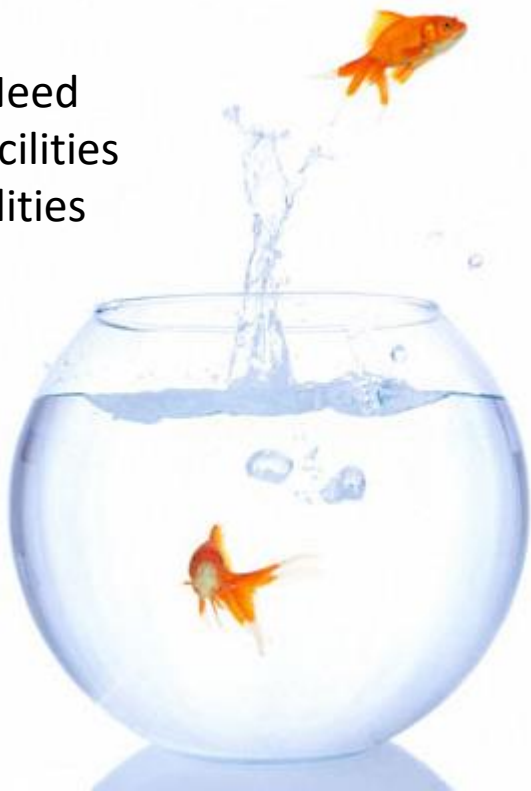
Planning for Capacity

Options:

Reduce Need

Larger Facilities

New Facilities



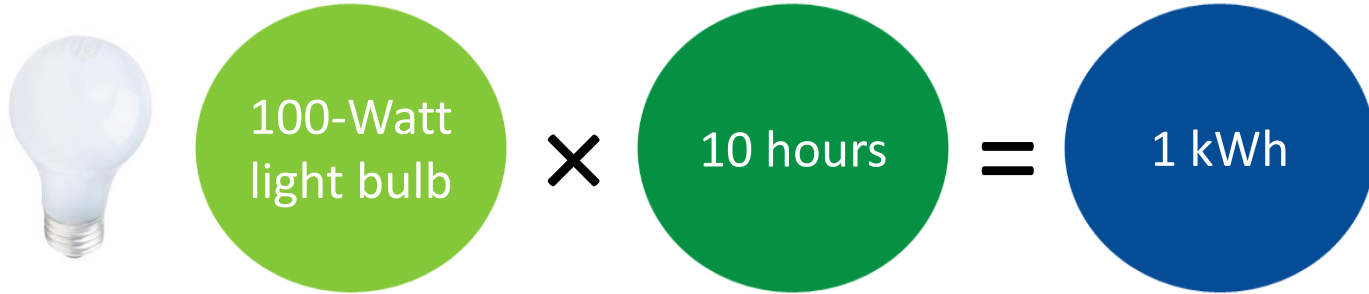
Capacity



Energy

The amount of power used in a given period:

- kilowatt-hour (kWh) = unit of measure for electrical energy



A diagram illustrating the calculation of 1 kilowatt-hour (kWh) of energy. It features a light bulb icon on the left, followed by a green circle containing the text "100-Watt light bulb". This is followed by a large black multiplication symbol (X), then a green circle containing the text "10 hours". This is followed by a large black equals symbol (=), and finally a blue circle containing the text "1 kWh".

$$\text{100-Watt light bulb} \times \text{10 hours} = \text{1 kWh}$$

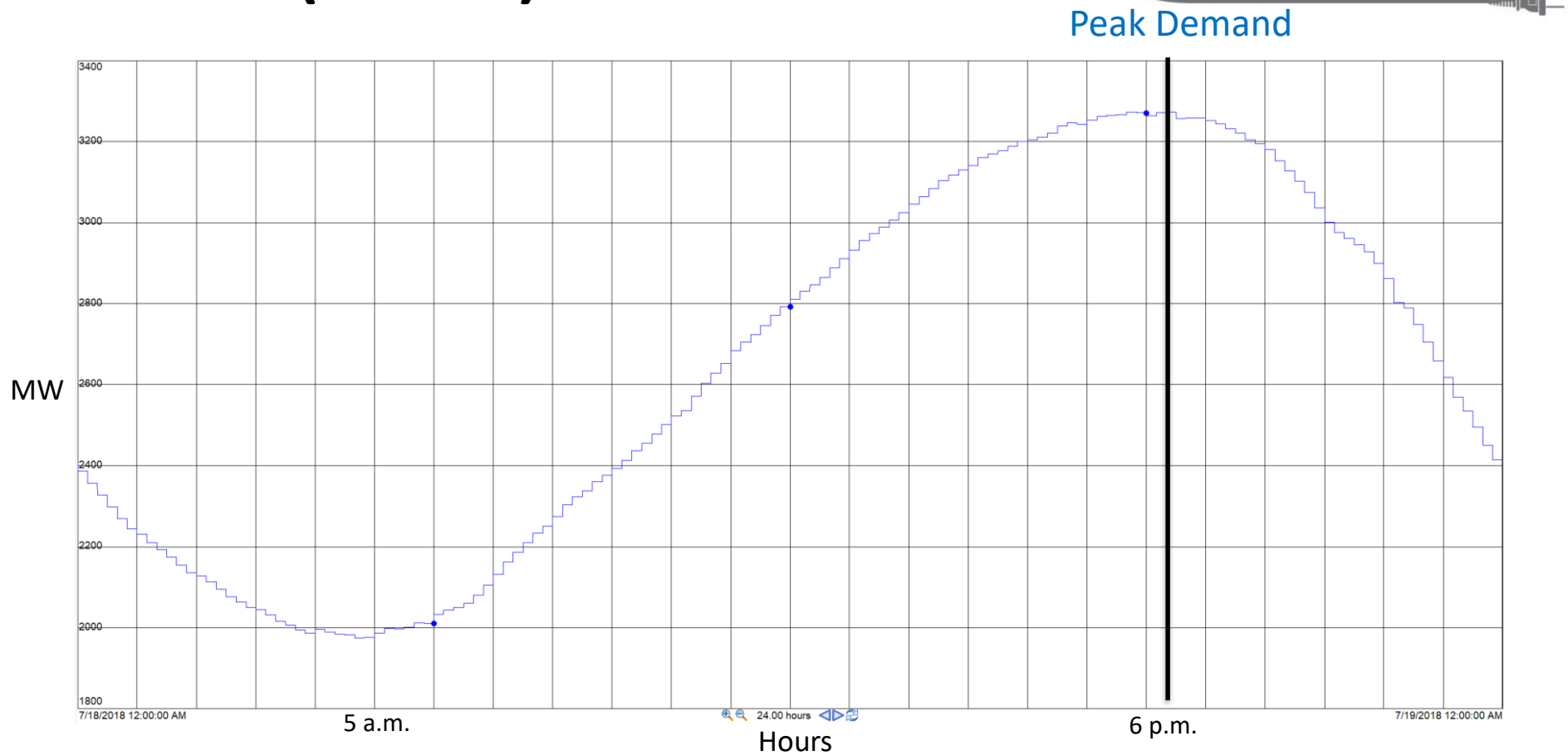
Energy vs Capacity Analogy

- Capacity: 2 vehicles at a time



- Energy: 1,000 vehicles pass the line in an hour

Demand (Power)



Typical Units for Power Delivery



	Base Unit	Typical Unit
Voltage	Volt (V)	kilovolt (kV)*
Power	Watt (W)	megawatt (MW)**
Capacity	Watt (W)	megawatt (MW)**
Energy	Watt-hours (Wh)	kilowatt-hours (kWh)

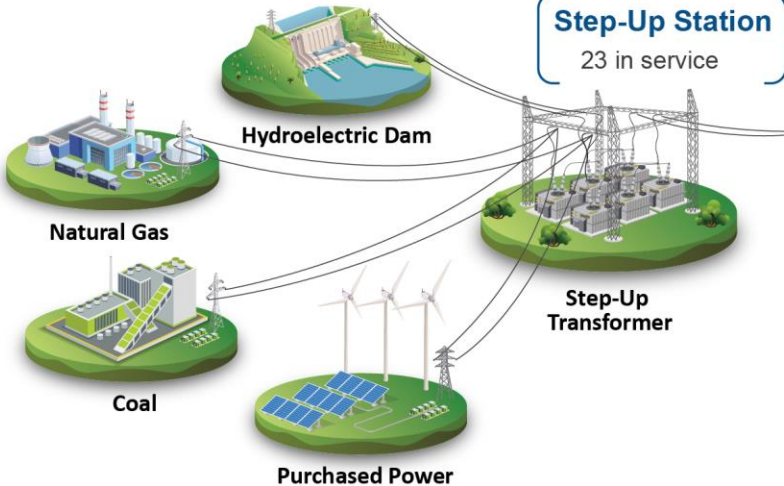
kilo = 1,000

mega = 1,000,000

Power Grid

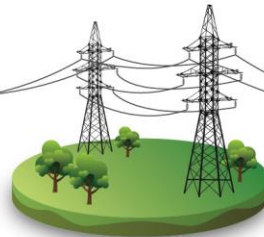
Idaho Power Generation

1,798.9	MW Hydro (17 Facilities)
920.1	MW Coal (2 Plants)
762.2	MW Natural Gas (3 Plants)
5	MW Diesel (1 Facility)
<hr/>	
3,486.2	Total MW



Transmission Lines

4,833 miles of
high-voltage
transmission lines



Transmission Lines

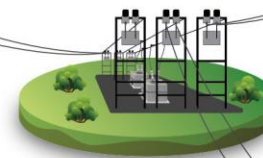
Distribution System

Customers

As of May 1, 2021 more than
590,000 retail customers

Substation

247 substations



Step-Down
Transformer



Distribution
to Businesses

Distribution Lines

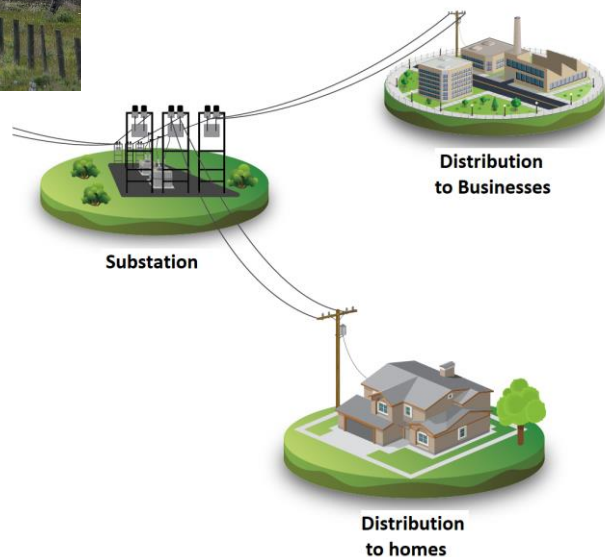
28,201 miles of
distribution lines



Distribution
to Homes

Distribution System

- 12.5 kV and 34.5 kV
- Overhead or underground
- From the substation to your homes and businesses



Poll Question



Eastern Oregon Distribution System



Idaho Power in Oregon

OREGON
Average
system load | **83 Megawatts**



Oregon
Customers **20,477**

4,000
SQUARE MILES

Idaho Power Distribution System Goal



“To safely, reliably, and cost-effectively meet near- and long-term load service requirements.”

Our Clean-Energy Goal

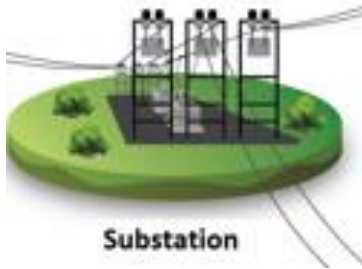
As Idaho Power continues serving customers and communities with **reliable, affordable** energy, we do so with an exciting goal:



Partner with customers to meet their energy needs and achieve our clean-energy goal

Energy Flow

- The distribution system allows energy to flow in either direction.



Utility Scale Renewables in Oregon

17 projects (15MW or under)

- 17 projects online, totaling 129 MW
- 1 project is scheduled to come online in 2022

Incremental Project Additions			
Year	Resource	No. of Projects	Size
2016	Solar	6	49.5
2017	Wind	5	50
2018	N/A	N/A	N/A
2019	Solar	1	2.75
2020	Solar	4	24.0

Customer-Owned Generation



Solar Customer Generation & Net Metering

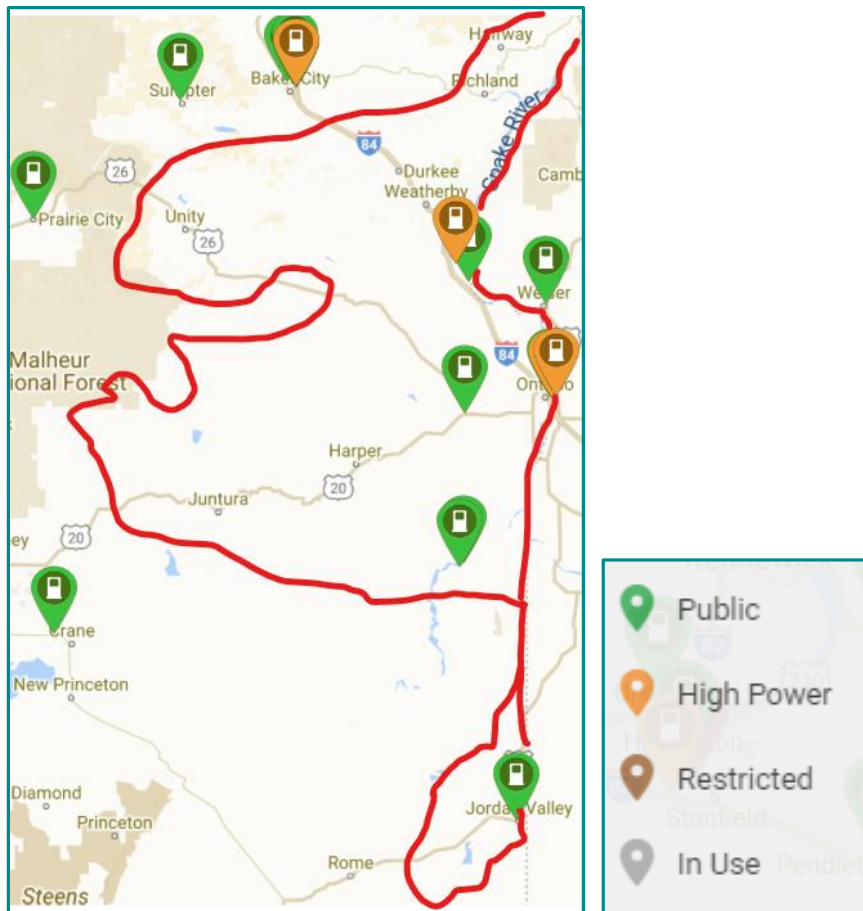
69 projects (1.37 MW total) are connected under the company’s net metering tariff (through end of 2020)

Incremental Customer Solar Generation in eastern Oregon		
Installation Year	# Solar Projects	Size (MW)
2014	3	0.21
2015	10	0.24
2016	5	0.25
2017	13	0.15
2018	10	0.14
2019	12	0.13
2020	6	0.09

Electric Vehicles (EVs)



EV Charging Stations in Oregon



Many New EVs Coming



2022 F-150 LIGHTNING

Starting at \$39,974¹

\$7,500 potential federal tax credit for the F-150 Lightning ⓘ

Due Today \$100*

Select a Dealer

Search By ☐ Location ☒ Dealer Name

Dealer Name

Enter dealer name

Next >

[Reservation FAQs >](#)

Reserve Now

RIVIAN

R1S
ADVENTURE PACKAGE



Projected range
300+ mi

Est. price
\$75,500

TESLA

CYBERTRUCK



ORDER CYBERTRUCK

SINGLE MOTOR RWD \$39,900

DUAL MOTOR AWD \$49,900

TRI MOTOR AWD \$69,900

+ FULL SELF-DRIVING \$10,000

Selecting Full Self-Driving today will secure your price as it increases in the future. [Learn more](#)

DUE TODAY \$100

Fully refundable. You will be able to complete your configuration as production nears in 2022.

250+MI
RANGE (EPA EST.)

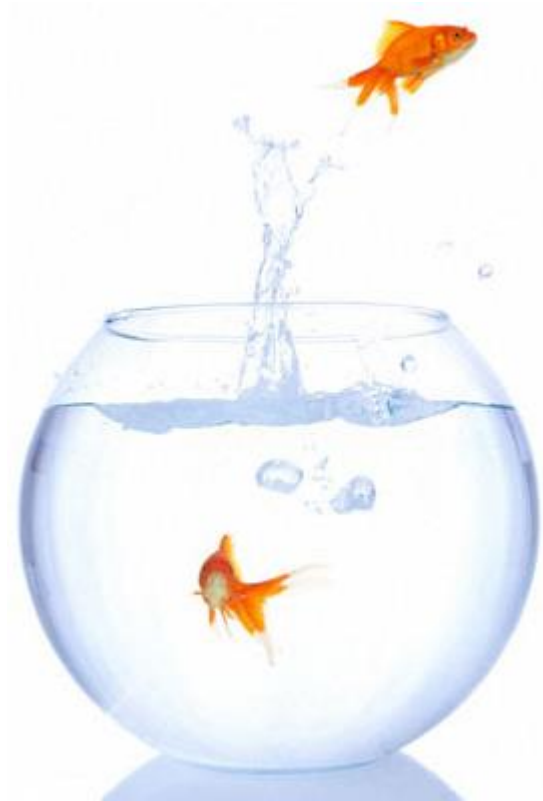
7,500+LBS
TOWING CAPACITY

<6.5s
0-60 MPH

Planning for Capacity

Options:

Reduce Need



Energy Efficiency Programs



Energy Efficient Programs

Residential

Easy Savings: Low-Income Energy Efficiency Education
Education Distributions
Energy Efficient Lighting
Energy House Calls
Heating & Cooling Efficiency Program
Home Energy Audit
Home Energy Report Pilot Program
Multifamily Energy Savings Program
Oregon Residential Weatherization
Rebate Advantage
Residential New Construction Pilot Program
Simple Steps, Smart Savings™
Weatherization Assistance for Qualified Customers
Weatherization Solutions for Eligible Customers

Energy Efficient Programs

Commercial

Commercial Energy-Savings Kits
Custom Projects
Green Motors - Industrial
New Construction
Retrofits

Irrigation

Green Motors - Irrigation
Irrigation Efficiency Rewards

Market Transformation

Northwest Energy Efficiency Alliance (NEEA)

<https://www.idahopower.com/accounts-service/construction-remodeling/energy-efficiency-information/>

Idaho Power Demand Response Programs

- Irrigation Peak Rewards ~ Oregon 9.5 MW (320 MW System)
- Commercial & Industrial Flex Peak ~ Oregon 11.9 MW (35 MW System)
- Residential A/C Cool Credit ~ Oregon 0.3 MW (35 MW System)



Public Involvement and Input

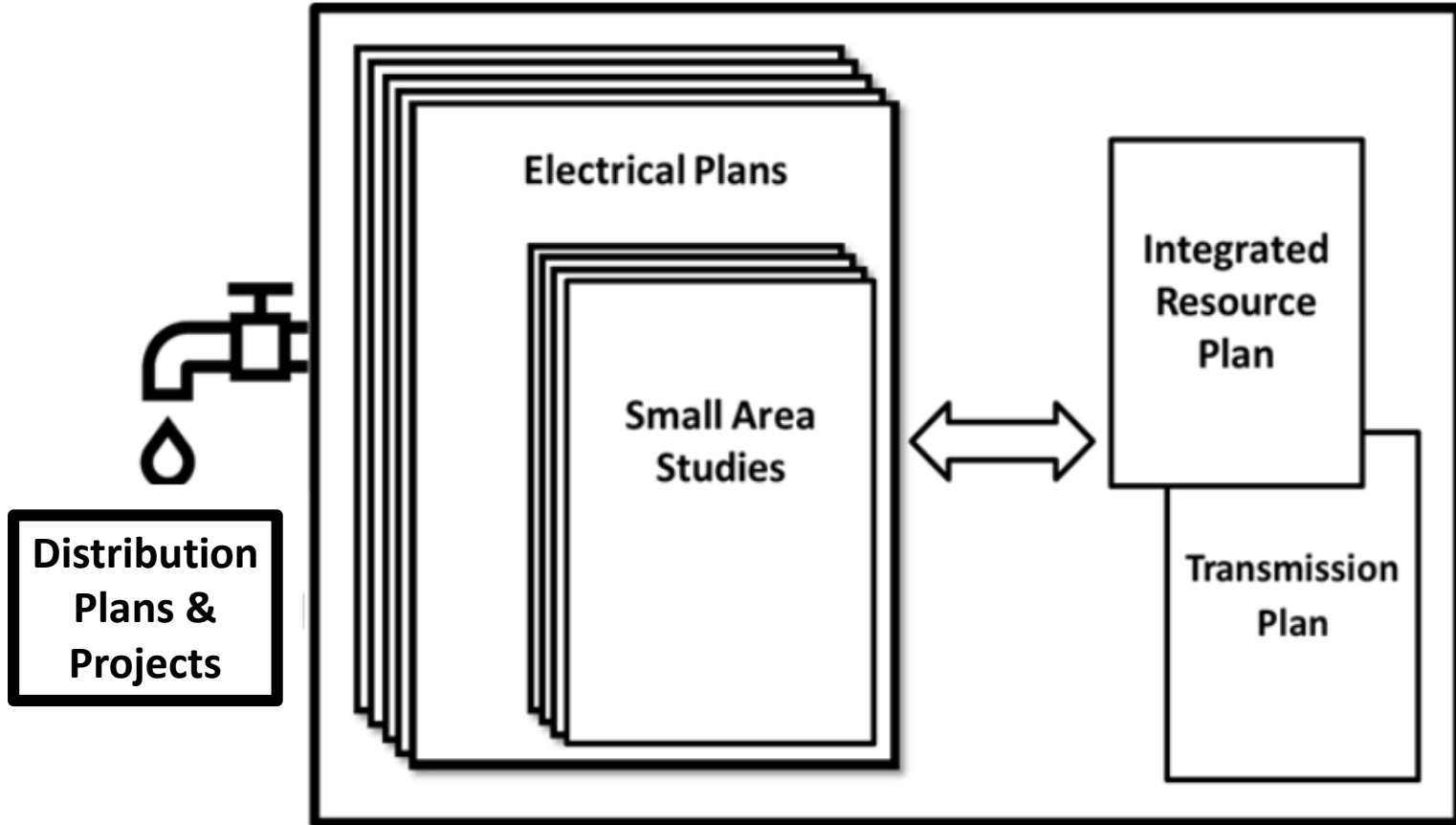


- Energy Efficiency Advisory Group (EEAG)
 - Meets Quarterly to advise on DSM programs
 - Members
 - Idaho and Oregon Public Utility Commissions
 - Environmental Organizations
 - State & Local Government
 - Irrigation/Commercial/Industrial Sectors
- Organizations
 - Northwest Energy Efficiency Alliance (NEEA)
 - Regional Technical Forum (RTF)
 - E Source/ACEEE/CEE

Poll Questions



Planning Processes



Integrated Resource Plan

- Long-term plan to balance system loads, resources, and costs
 - system load growth projections
 - future energy cost estimates
 - energy efficiency programs
 - future energy resource projections
- Stakeholder participation
 - provide input on load, energy, and resource scenarios to analyze
 - provide feedback on analysis methods and outcomes



Regional & Local Transmission Plans

- Present long-term (10-20 year) transmission plans
- Considers power flow on transmission system
- Gather feedback from stakeholders
- Regional coordination with other utilities



A close-up photograph of a person's hand pointing their index finger at a map. The map is spread out on a surface and shows various colored lines (blue, green, red, orange) representing different types of infrastructure, likely electrical transmission lines. The background of the map is a light brown/tan color, possibly representing land or a specific region. The text 'Regional Electrical Plans' is overlaid in white on the left side of the image.

Regional Electrical Plans

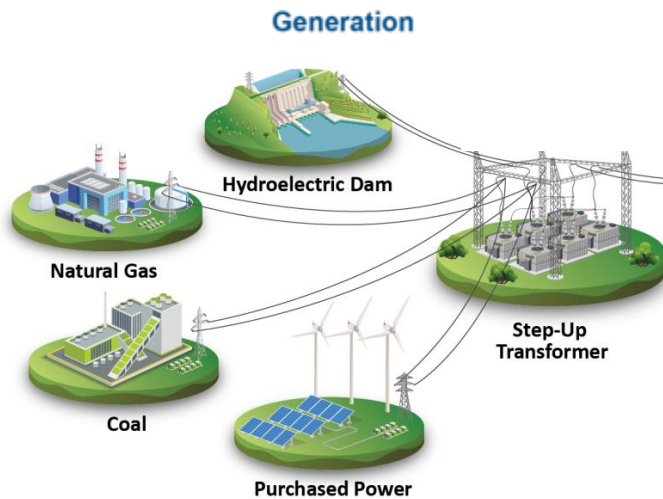
- Long-term (20+ year) planning for transmission lines and substations
- Community advisory committee process
 - Prioritize reliability, environmental impact, and future energy needs
 - Identify preferred future locations for transmission lines and substations
 - Does not include distribution lines

Small Area Studies



1. Review of single substation and connected distribution facilities
2. Three-year rotation, or more often if needed
3. Forecast peak loading 1-10 years
 - Consider temperature impact on peak loads
4. Identify capacity constraints
5. Create Solutions
 - seek alignment with area electric plan
 - review non-traditional solutions (batteries, solar,...)
 - projects typically 4+ years from concept to construction

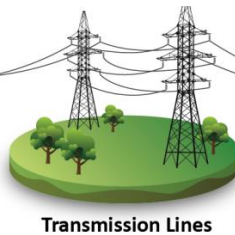
Integrated Resource Plan



Transmission Plans

Regional Electrical Plans

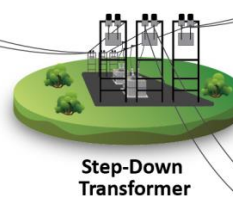
Transmission Lines



Distribution System Plan

Distribution Lines

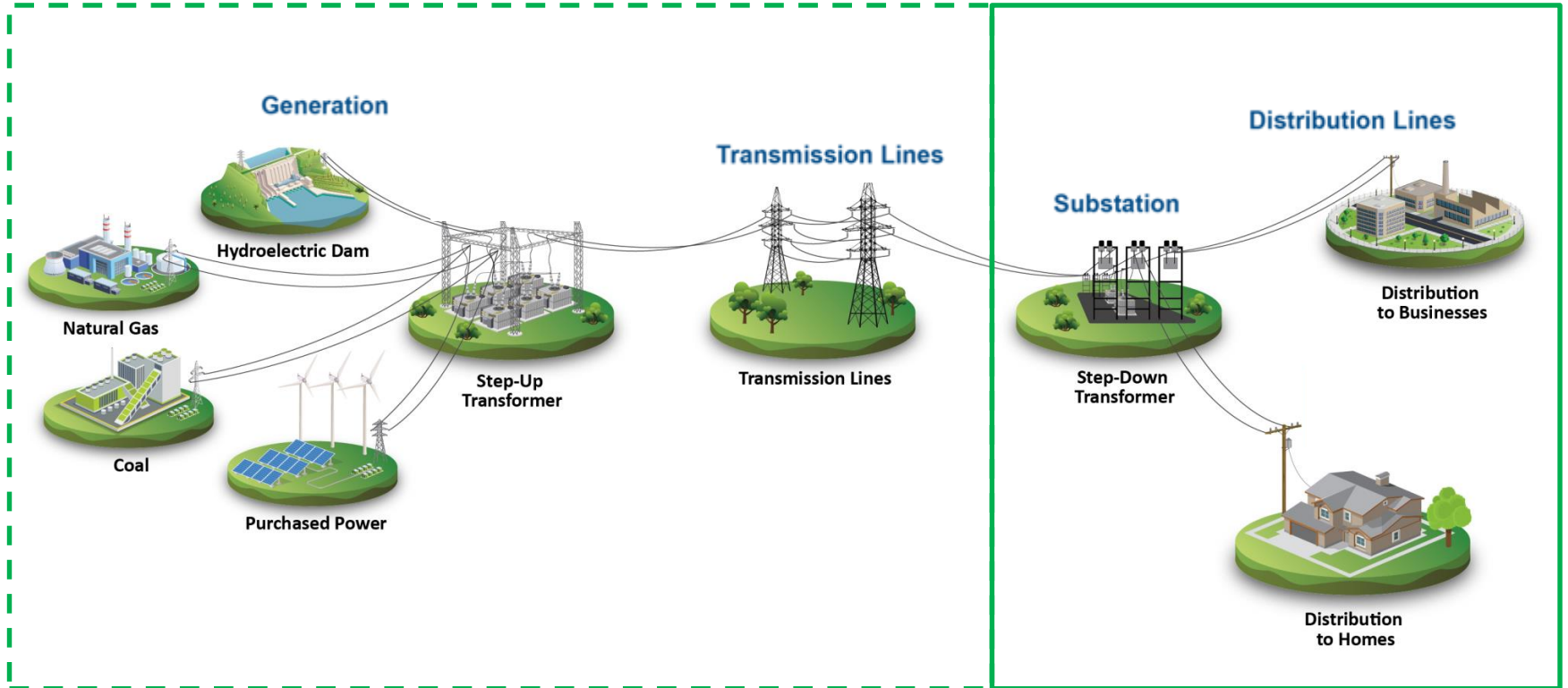
Substation



Distribution to Businesses

Distribution to Homes

Distribution System Plan



Distribution System Plan



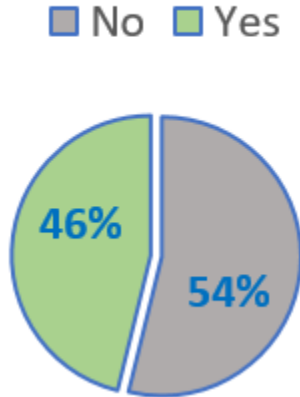
Distribution System Planning Topics



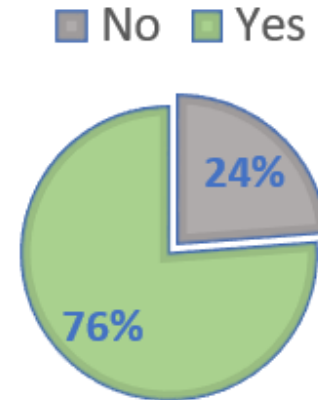
- Baseline Data
- Hosting Capacity Analysis
- Community Engagement Plan
- Long-Term Plan

Baseline Data - Eastern Oregon

- 26 Distribution Substations
SUBSTATIONS WITH SCADA



- 63 Distribution Circuits
CIRCUITS WITH SCADA

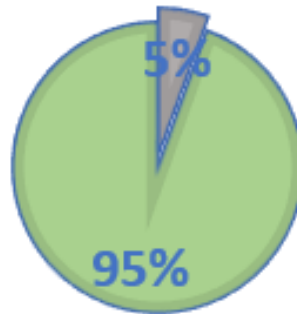


Supervisory Control and Data Acquisition - SCADA

Baseline Data - Eastern Oregon

CUSTOMERS SERVED FROM STATIONS WITH SCADA

■ No ■ Yes



99% of customers in eastern Oregon are served with smart meters

Hosting Capacity Analysis



- Definition: Process to provide information about the ability of a distribution system to support **new generation** without breaking
- Develop a plan for a more detailed analysis
- Develop a public facing map

Community Engagement Plan

- Community-centered approach to DSP
- Input on methodology for identifying/prioritizing distribution investments
- Input on development of pilot projects



Long-Term (5-10-year) Plan

- Integrate EVs & distributed generation forecasts
- Continue non-traditional solution reviews
- Review long-term distribution investments
- Maintain affordable prices for our customers



Poll Questions



Distribution System Discussion



- What questions do you have?
- Is there any topic you'd like to learn more about?
- What issues/topics are you specifically interested in?

Next Steps & Meeting 2



1. Gather feedback from this meeting, poll questions, and email (DSP@idahopower.com)
2. Identify topics and projects for deeper discussion (less education-oriented than Meeting 1)



Thank you