Meeting Agenda

• 5:00 to 6:00
  – Welcome- Jason Thackston, SVP of Energy Resources
  – Overview of Avista’s Electric Resource Plan- James Gall, Electric IRP Manager
  – Overview of Avista’s Natural Gas Resource Plan- Tom Pardee, Natural Gas IRP Manager
• 6:00 to 6:30
  – Attend first breakout session
• 6:30 to 7:00
  – Attend second breakout session
• This meeting will be recorded
Objectives of Today’s Meeting

• Overview of Avista’s electric and natural gas systems.
• Learn about considerations when planning to meet customer load.
• Explore Avista’s proposed resource plans for natural gas and electric supply.
• Opportunity to ask questions and provide feedback in breakout sessions.
• Poll questions to provide instant feedback.
Avista also owns Alaska Light & Power in Juneau, AK.
Maintaining Balance is Important

- Affordability
- Reliability
- Environment
Avista’s goal is to serve our customers with **100 percent clean electricity by 2045** and to have a **carbon-neutral** supply of electricity by the end of **2027**

- We will maintain focus on **reliability** and **affordability**

- **Natural gas** is an important part of a clean energy future

- **Technologies and associated costs** need to emerge and mature in order for us to achieve our stated goals

- It’s **not** just about generation
Providing Cleaner Natural Gas

• We are committed to reducing greenhouse gas emissions in our natural gas business too.

• Achieving reductions requires an “all-of-the-above” approach:
  • Natural gas supply and distribution opportunities like renewable natural gas
  • Upstream strategies like targeted sourcing with suppliers
  • Engagement with customers to increase energy efficiency, demand response, and voluntary programs

• Just like our clean electricity goals, reducing greenhouse gas emissions in our natural gas system will require advances in technology and reductions in the cost of those technologies.

• Affordability will guide our decisions.
What is an IRP?

- Required by our state regulating commissions every two years.
- Allows for public feedback and participation.
- Commissions acknowledge, but do not approve the plans.

- Understand supply needs to serve our customers over the next 20 years.
- Evaluate different resource options to meet future needs.
- Determine which resources are best suited to meet customer need.
- Sets course for acquisition of resources.
Draft 2021
Electric Integrated Resource Plan
What's in your energy rate?

### Electric
- **Production**, $0.0412
- **Transmission**, $0.0087
- **Distribution**, $0.0216
- **Common**, $0.0172

### Natural Gas
- **Production**, $0.2763
- **Distribution**, $0.2395
- **Common**, $0.1682
- **Storage**, $0.0236

### Pricing Type
- **Fixed Charge**: Monthly connection charge
- **Energy Charge**: The amount of energy used over the month
- **Demand Charge**: The highest use over an hour in the last 12 months
What fuels our generating resources?
Why does Avista need new electric resources?

Avista also plans to meet summer peak conditions & to ensure it generates enough energy over the course of the year in poor hydro conditions.
What options can meet our electric customer obligations?

**Clean Resources**
- Wind
- Solar
- Biomass
- Hydro
- Geothermal
- Nuclear

**Fossil Fuel Resources**
- Natural gas peaker
- Natural gas baseload
- Coal (retention)
- *Customer generation*

**Demand Resources**
- Energy efficiency
- Conservation
- Load control
- Rate programs
- *Fuel switching*
- Co-generation

**Storage**
- Pumped hydro
- Lithium-ion batteries
- Liquid air energy storage
- Flow batteries
- Hydrogen

*Resources in italics were not directly modeled for this IRP.*
Electric IRP’s Preferred Resource Strategy over next 10 years

**Generation Portfolio**
- By end of 2025: Exit Colstrip
- 2023-24: Add new renewables (i.e., wind, solar, hydro)
- 2026-2027: Replace Lancaster natural gas plant (natural gas generation is lowest cost option) & increase capacity at the Kettle Falls Generating Station & Post Falls
- 2028: Add new renewable resources (Montana wind)
- 2031: Acquire existing Northwest Hydro Capacity
- 2035: Replace Northeast natural gas plant with upgrades to Rathdrum CT and acquire new capacity

**Energy Efficiency**
- Energy Efficiency meets 68% of future load growth
- Industrial & commercial customers provide 2/3 of savings
- Residential Single family home is largest single segment
- Washington top targets: Lighting, space heating, water heating, refrigeration, and cooling
- Idaho top targets: Lighting, space heating, and motors

**Demand Response**
- 2024: Offer new rate programs (opt-in)
  (Time of use rates & variable peak pricing)
- 2026/27: Industrial load control
- 2031-32: Smart thermostat controls and commercial load control
Avista’s Cleaner Future

- Clean energy percent of system sales increase to 78% by 2027 and 86% by 2045.

By 2030, Avista’s greenhouse gas emissions fall by 76 percent.

- 2019 Northwest power emissions were 57 million metric tons (Avista is 5.2% of those emissions).

- Power is 20% of all NW greenhouse gas emissions.
Existing Resources vs. Peak Day Demand

Idaho and Washington

Medford and Roseburg
What are the options to meet natural gas customer needs?

**Clean Resources**
- Renewable Natural Gas
- Hydrogen
- Power to Gas

**Fossil Fuel Resources**
- Natural gas
- Coal gasification

**Demand Resources**
- Energy efficiency
- Conservation
- Load control
- Rate programs
- Fuel switching

**Storage**
- Jackson Prairie Storage Facility
- Liquified Natural Gas Compressed Natural Gas

*Resources in italics were not directly modeled for this IRP*
Natural Gas System Cost vs. Carbon Adder

- **Millions of Dth**
- **Millions**

- **All other Costs**
- **Carbon Adder**
- **System Demand**

- Years: 2021 to 2040
Avista Natural Gas – A Cleaner Future

2019 Retail Energy Delivered

Carbon Reduction Goals (Oregon & Washington)

- Oregon - Executive Order 20-04
  - 80% reduction by 2050
- Washington - Goal
  - 95% reduction by 2050
How do I get involved with Avista’s IRPs?

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Natural Gas Docket: UG-190724

Idaho PUC
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Oregon PUC
www.oregon.gov/puc

• Breakout rooms today
• Provide written comments to Avista’s planning team by March 5th.
• Provide written comments to your state’s commission
• Join Avista’s Technical Advisory Committees
  – Electric IRP
  – Natural Gas IRP
  – Energy Efficiency
• Future participation opportunities
  – Equity
  – Energy Assistance
  – Distribution Planning
Breakout Sessions

- Two 30 minute breakout room opportunities.
- You can access breakout rooms by using the links in the chat box or stay in this session.
  - Passcode: Avista
- Short presentation by Avista staff (5 minutes).
- Opportunity to ask Avista staff questions or provide comments.
- Any questions not answered today will be available on the IRP Avista website by March 12.
- Limit of 300 participants in each room

- **Generation Resource Selection & Reliability**
  - Stay here or use registration link
  - Webinar ID: 82608251 3174
- **Energy Efficiency & Demand Response**
  - https://us02web.zoom.us/j/82664724856?pwd=QzdUMk9zUE1nRjViYTIXRkJ5S2p5UT09
  - Meeting ID: 826 6472 4856
- **Affordability & Equity**
  - https://us02web.zoom.us/j/88435288369?pwd=bGtNK3JYbTBcI1zCV2JMRE1sT09CZz09
  - Meeting ID: 884 3528 8369
- **Environmental Topics**
  - https://us02web.zoom.us/j/89096065417?pwd=M0FzYWZHdjhTQjRRR2xwOSs4M1ByZz09
  - Meeting ID: 890 9606 5417
- **Natural Gas Service**
  - https://us02web.zoom.us/j/84369554229?pwd=YkZJc0ZrUm91NFVFSanNjmxPaVB4UT09
  - Meeting ID: 843 6955 4229
Breakout Session Ground Rules

• Due to the large response to this public meeting, please limit comments and questions to 30 seconds.
  • Avista will try to answer all questions.
  • Avista will also provide written responses if we cannot fully address the question.
  • Comments will be acknowledged and recorded.
• If you would like to make a comment or ask a question.
  • Use the “raise hand” feature in the meeting controls.
  • We will call upon each person to speak.
  • Lower your hand after your comment.
  • Please comment on areas within the breakroom topic.
• Please do not repeat questions or comments.
  • If you have the same comments- please indicate in the chat box or send an email to irp@avistacorp.com with your comment.
• In the event we do not get to your comment or question in the allotted time, please email irp@avistacorp.com.
• Please limit comments or questions to resource planning- this means in relation to the energy we serve and not the delivery of energy. If you have these questions or any others please see:
  • http://myavista.com/smartmeters
  • askavista@myavista.com
Resource Selection & Reliability Breakout Room

James Gall
Thomas Dempsey
Damon Fisher
Resource Options

- Multiple factors drive resource selection
  - Cost or price
  - Clean vs. fossil fuel
  - Capacity value or “peak credit”
  - Storage vs. energy production
  - Location
  - Availability (new vs. existing)

- Resource retirements
  - Future capital investment
  - Operating & maintenance cost/availability
  - Fuel availability
  - Carbon pricing risk

- Non-energy costs & benefits
  - Social cost of carbon
  - Locational siting
  - Health, economic, and other benefits (still to come)

Clean Resources
- Wind
- Solar (utility and customer)
- Biomass
- Hydro
- Geothermal
- Nuclear

Fossil Fuel Resources
- Natural gas peaker
- Natural gas baseload
- Coal (retention)
  - Customer generation

Demand Resources
- Energy efficiency
- Conservation
- Load control
- Rate programs
  - Fuel switching
  - Co-generation

Storage
- Pumped hydro
- Lithium-ion batteries (utility & customer)
- Liquid air energy storage
- Flow batteries
- Hydrogen

Resources in italics were not directly modeled for this IRP
## Supply-Side Resource Changes

- Long-term acquisition of new resources will be conducted with a public request for proposals (RFP).
  - Avista added the Rattlesnake Flat Wind project in 2020.
  - Avista is currently working with clean energy proposals from its most recent RFP - this RFP will determine a portion of the resource need in 2023-2024.
- New resource selection is determined by deliverability and lowest economic cost subject to resource policy requirements of each state.

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Year</th>
<th>State</th>
<th>Capability (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colstrip (Coal)</td>
<td>By end of 2025</td>
<td>System</td>
<td>(222)</td>
</tr>
<tr>
<td>Montana wind</td>
<td>2023</td>
<td>WA</td>
<td>100</td>
</tr>
<tr>
<td>Montana wind</td>
<td>2024</td>
<td>WA</td>
<td>100</td>
</tr>
<tr>
<td>Lancaster (Natural Gas)</td>
<td>2026</td>
<td>System</td>
<td>(257)</td>
</tr>
<tr>
<td>Post Falls Modernization (Hydro)</td>
<td>2026</td>
<td>System</td>
<td>8</td>
</tr>
<tr>
<td>Kettle Falls upgrade (Wood-Biomass)</td>
<td>2026</td>
<td>System</td>
<td>12</td>
</tr>
<tr>
<td>Natural gas peaker</td>
<td>2027</td>
<td>ID</td>
<td>85</td>
</tr>
<tr>
<td>Natural gas peaker</td>
<td>2027</td>
<td>System</td>
<td>126</td>
</tr>
<tr>
<td>Montana wind</td>
<td>2028</td>
<td>WA</td>
<td>100</td>
</tr>
<tr>
<td>NW Hydro Slice</td>
<td>2031</td>
<td>WA</td>
<td>75</td>
</tr>
<tr>
<td>Rathdrum CT upgrade (Natural Gas)</td>
<td>2035</td>
<td>System</td>
<td>5</td>
</tr>
<tr>
<td>Northeast (Natural Gas)</td>
<td>2035</td>
<td>System</td>
<td>(54)</td>
</tr>
<tr>
<td>Natural gas peaker</td>
<td>2036</td>
<td>System</td>
<td>87</td>
</tr>
<tr>
<td>Solar w/ storage</td>
<td>2038</td>
<td>System</td>
<td>100</td>
</tr>
<tr>
<td>4-hr storage for solar</td>
<td>2038</td>
<td>System</td>
<td>50</td>
</tr>
<tr>
<td>Boulder Park (Natural Gas)</td>
<td>2040</td>
<td>System</td>
<td>(25)</td>
</tr>
<tr>
<td>Natural gas peaker</td>
<td>2041</td>
<td>ID</td>
<td>36</td>
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<tr>
<td>Montana wind</td>
<td>2041</td>
<td>WA</td>
<td>100</td>
</tr>
<tr>
<td>Solar w/ storage</td>
<td>2042-2043</td>
<td>WA</td>
<td>239</td>
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<tr>
<td>4-hr storage for solar</td>
<td>2042-2043</td>
<td>WA</td>
<td>119</td>
</tr>
<tr>
<td>Liquid air energy storage</td>
<td>2044</td>
<td>WA</td>
<td>12</td>
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<tr>
<td>Liquid air energy storage</td>
<td>2045</td>
<td>ID</td>
<td>10</td>
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<tr>
<td>Solar w/ storage</td>
<td>2045</td>
<td>WA</td>
<td>149</td>
</tr>
<tr>
<td>4-hr storage for solar</td>
<td>2045</td>
<td>WA</td>
<td>75</td>
</tr>
</tbody>
</table>

Supply-side resource net total (MW) 1,032
Supply-side resource total additions (MW) 1,589
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Energy Efficiency and Demand Response Breakout Room

Ryan Finesilver
Leona Haley
**Energy Efficiency & Demand Response**

**Conservation Potential**
- Study to determine overall conservation potential

**Integrated Resource Planning**
- Preferred Resource Strategy selects “measures” and sets target

**Energy Efficiency Program**
- Program designed to “incent” customers to make energy efficiency choices

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**10-YEAR GWH CONSERVATION POTENTIAL**

<table>
<thead>
<tr>
<th>Category</th>
<th>Washington</th>
<th>Idaho</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interior Lighting (C&amp;I)</td>
<td>135.3</td>
<td></td>
</tr>
<tr>
<td>Space Heating (Res)</td>
<td>139.5</td>
<td></td>
</tr>
<tr>
<td>Water Heating (Res)</td>
<td></td>
<td>64.3</td>
</tr>
<tr>
<td>Refrigeration (C&amp;I)</td>
<td></td>
<td>62.7</td>
</tr>
<tr>
<td>Motors (C&amp;I)</td>
<td></td>
<td>60.9</td>
</tr>
<tr>
<td>Cooling (C&amp;I)</td>
<td></td>
<td>42.0</td>
</tr>
<tr>
<td>Ventilation (C&amp;I)</td>
<td></td>
<td>35.4</td>
</tr>
<tr>
<td>Exterior Lighting (C&amp;I)</td>
<td></td>
<td>31.9</td>
</tr>
<tr>
<td>Space Heating (C&amp;I)</td>
<td></td>
<td>21.9</td>
</tr>
<tr>
<td>Electronics (Res)</td>
<td></td>
<td>19.0</td>
</tr>
<tr>
<td>Other (C&amp;I)</td>
<td></td>
<td>11.5</td>
</tr>
<tr>
<td>Miscellaneous (Res)</td>
<td></td>
<td>10.0</td>
</tr>
<tr>
<td>Interior Lighting (Res)</td>
<td></td>
<td>10.0</td>
</tr>
<tr>
<td>Water Heating (C&amp;I)</td>
<td></td>
<td>7.5</td>
</tr>
<tr>
<td>Miscellaneous (C&amp;I)</td>
<td></td>
<td>6.1</td>
</tr>
<tr>
<td>Appliances (Res)</td>
<td></td>
<td>4.4</td>
</tr>
</tbody>
</table>

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**Demand Response**

- **Time of Use Rates**: 2 MW (2024) / 2 MW (2024)
- **Variable Peak Pricing**: 7 MW (2024) / 6 MW (2024)
- **Large C&I Program**: 25 MW (2027) / n/a
- **DLC Smart Thermostats**: 7 MW (2031) / n/a
- **Third Party Contracts**: 14 MW (2032) / 8 MW (2024)
- **Behavioral**: 1 MW (2041) / n/a

**Total**: 56 MW / 15 MW
Natural Gas Energy Efficiency

- Residential: 57%
- Commercial: 41%
- Industrial: 2%

Way to Save

- [Find a rebate](https://www.myavista.com/energy-savings/way-to-save)
- Energy saving advice
- Shop for appliances

<table>
<thead>
<tr>
<th>Energy Use</th>
<th>Millions of Therms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Heating</td>
<td>5.78</td>
</tr>
<tr>
<td>Water Heating</td>
<td>5.14</td>
</tr>
<tr>
<td>Weatherization</td>
<td>4.8</td>
</tr>
<tr>
<td>Other</td>
<td>1.27</td>
</tr>
<tr>
<td>Ventilation</td>
<td>0.42</td>
</tr>
<tr>
<td>Cooking</td>
<td>0.33</td>
</tr>
<tr>
<td>Process Heating</td>
<td>0.16</td>
</tr>
<tr>
<td>Appliances</td>
<td>0.04</td>
</tr>
<tr>
<td>HVAC</td>
<td>0.03</td>
</tr>
</tbody>
</table>
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Affordability and Equity Breakout Room

Ana Matthews
Shawn Bonfield
Renee Coelho
Lisa McGarity
Washington Clean Energy Transformation Act – Energy Equity

CETA requires that all customers are benefiting from the transition to clean energy:

- Through the equitable distribution of energy and nonenergy benefits; and,
- Reduction of burdens to vulnerable populations and highly impacted communities.

• Equitable distribution means a fair and just, but not necessarily equal, allocation of benefits and burdens from the utility's transition to clean energy.
• Equitable distribution is based on disparities in current conditions.
Asset Limited, Income Constrained and Employed (ALICE)

Sources:
- Eligible Households Sources:
  - Oregon: Apprise, 2020 LIHEAP/OEAP Evaluation
  - Idaho: Community Action Partnership Association of Idaho

<table>
<thead>
<tr>
<th>State</th>
<th>Eligible Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>29,311</td>
</tr>
<tr>
<td>Washington</td>
<td>95,387</td>
</tr>
<tr>
<td>Oregon</td>
<td>18,410</td>
</tr>
<tr>
<td>Total</td>
<td>142,108</td>
</tr>
</tbody>
</table>
Avista Energy Assistance Overview

- Low-Income Rate Assistance Program (LIRAP) available in Oregon & Washington
- Conservation Education available in Idaho & Washington
- Weatherization available in all three states

Bill Assistance
- LIRAP Heat
- LIRAP Senior/Disabled Outreach

Emergency Assistance
- LIRAP Emergency Share
- COVID-19 Hardship

Rate Discount
- Senior/Disabled

Implemented in 2021
- Percent of Income Payment Plan
- Arrearage Management Program

Conservation Education
- Energy Fairs
- Workshops
- General and Mobile Outreach

Energy Efficiency
- Low-Income Weatherization
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Avista’s Environmental Footprint

• By 2030, Avista’s greenhouse gas emissions fall by 76 percent.
• 2019 Northwest power emissions were 57 million metric tons (Avista is 5.2% of those emissions).
• Power is 20% of all NW greenhouse gas emissions.

Greenhouse Gas Emissions Forecast

• Total emissions are determined by utilization of facilities and control technology.
• NOx emissions fall by over 50% due to smart burn technology at Colstrip coal fired facility.
• VOC emission rise is due to increased plant utilization and new testing at the Kettle Falls Biomass facility.
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Natural Gas Breakout Room

Tom Pardee
Michael Whitby
Jody Morehouse
Carbon Reduction Pathways

Renewable Natural Gas (RNG)
- Biogas from decomposing waste streams is captured
- The gas is scrubbed to pipeline quality RNG
- RNG flows through existing natural gas pipelines to end users

Power to Gas with Hydrogen
- Renewable electricity converts water to hydrogen
- Hydrogen is combined with waste CO₂ to make RNG
- RNG flows through existing natural gas pipelines to end users
Natural Gas is Critical to a Clean Energy Future

• In the right applications, **direct use of natural gas is best use**

• Natural gas generation provides **critical capacity** as renewables expand until utility-scale storage is cost effective and reliable

• Full electrification can lead to **unintended consequences**:  
  • Creates new generation needs that can increase carbon emissions  
  • Drives new investment in electric distribution infrastructure, causing bill pressure  
  • Home and business conversion costs borne by customers  
  • Puts at risk energy **reliability and resilience, energy choice, and affordability**

• Customers have paid for a vast pipeline infrastructure that can utilized for a cleaner future by **transitioning the fuel** and keeping the pipe

• A comprehensive view of the energy ecosystem leads to a **diversified approach to energy supply** that includes natural gas
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