# 2025 Integrated Resource Plan (IRP) – Open House

Presented by NW Natural's IRP Team
October 10, 2024

NW Natural®

# Forward Looking Statement

This and other presentations made by NW Natural from time to time, may contain forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as “anticipates,” “intends,” “plans,” “seeks,” “believes,” “estimates,” “expects” and similar references to future periods. Examples of forward-looking statements include, but are not limited to, statements regarding the following: including regional third-party projects, storage, pipeline and other infrastructure investments, commodity costs, competitive advantage, customer service, customer and business growth, conversion potential, multifamily development, business risk, efficiency of business operations, regulatory recovery, business development and new business initiatives, environmental remediation recoveries, gas storage markets and business opportunities, gas storage development, costs, timing or returns related thereto, financial positions and performance, economic and housing market trends and performance shareholder return and value, capital expenditures, liquidity, strategic goals, greenhouse gas emissions, carbon savings, renewable natural gas, hydrogen, gas reserves and investments and regulatory recoveries related thereto, hedge efficacy, cash flows and adequacy thereof, return on equity, capital structure, return on invested capital, revenues and earnings and timing thereof, margins, operations and maintenance expense, dividends, credit ratings and profile, the regulatory environment, effects of regulatory disallowance, timing or effects of future regulatory proceedings or future regulatory approvals, regulatory prudence reviews, effects of regulatory mechanisms, including, but not limited to, SRRM and the Company’s infrastructure investments, effects of legislation, including but not limited to bonus depreciation and PHMSA regulations, and other statements that are other than statements of historical facts.

Forward-looking statements are based on our current expectations and assumptions regarding our business, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict. Our actual results may differ materially from those contemplated by the forward-looking statements, so we caution you against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Important factors that could cause actual results to differ materially from those in the forward-looking statements are discussed by reference to the factors described in Part I, Item 1A “Risk Factors,” and Part II, Item 7 and Item 7A “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” and “Quantitative and Qualitative Disclosure about Market Risk” in the Company’s most recent Annual Report on Form 10-K, and in Part I, Items 2 and 3 “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Quantitative and Qualitative Disclosures About Market Risk”, and Part II, Item 1A, “Risk Factors”, in the Company’s quarterly reports filed thereafter.

All forward-looking statements made in this presentation and all subsequent forward-looking statements, whether written or oral and whether made by or on behalf of the Company, are expressly qualified by these cautionary statements. Any forward-looking statement speaks only as of the date on which such statement is made, and we undertake no obligation to publicly update any forward-looking statement, whether as a result of new information, future developments or otherwise, except as may be required by law.

# Agenda

- Welcome and meeting logistics
- Introductions
- Safety Moment
- Overview of NW Natural and our customers
- Overview of Gas Supplies and RNG
- Overview of IRPs and how you can engage with us
- IRP Tools

For those in-person

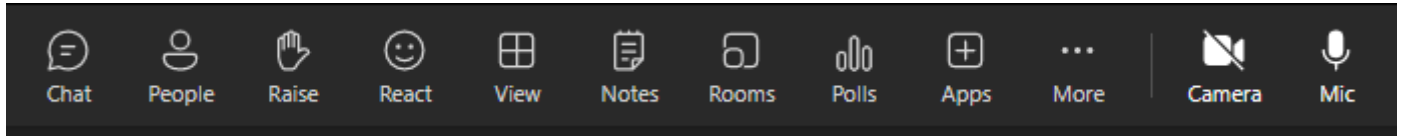
- Tour of Gas Control

This meeting will be recorded and posted on NW Natural's website:

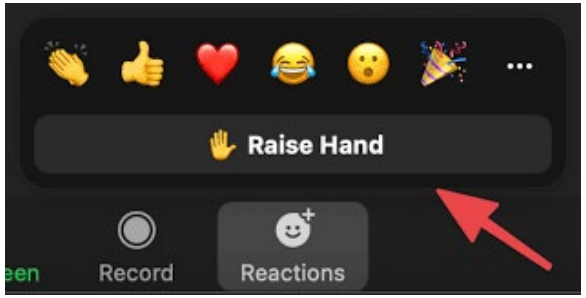
https://www.nwnatural.com/about-us/rates-and-regulations/integrated-resource-plan

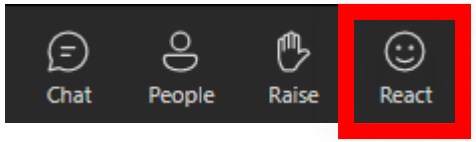
# How to Interact in a Teams Meeting

- Participant Controls are at the top or bottom of your screen

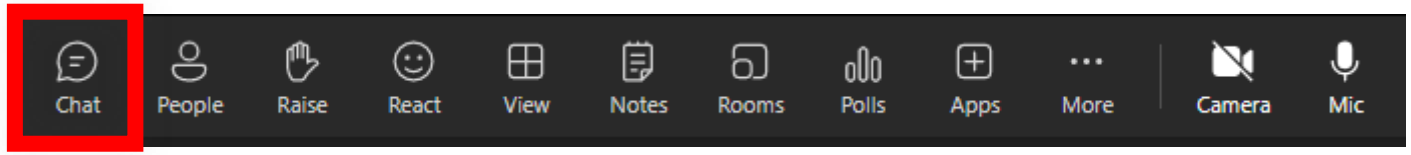



- Ask a question or comment at any time using the “raised hand”




- You may also use the chat box




A member of the IRP team will monitor the chat, and participant list for raised hands during the meeting.

# Meeting Best Practices – hybrid spaces

To maintain an engaged and productive space, please:

Mute your mic unless asking a question and/or providing comment

Turn your camera on (if your bandwidth allows and you are comfortable with camera on)

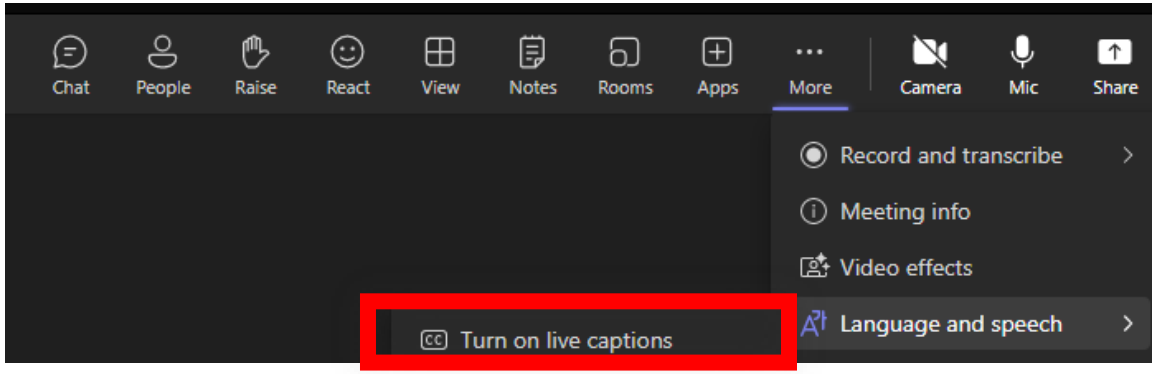
Limit side conversations

*(in chat or in the room)*

Make efforts to adhere to the meeting schedule

# Teams Meeting – Accessibility Functions

- Live Captions - real-time auto-generated text of what is said in a meeting. They appear a few lines at a time for a user who has turned them on, and aren't saved




- Reducing Distractions and Customizing Views:
  - Microsoft Teams has a variety of features to support different learning styles, please find reference material for:
    - Turn on live captions during meetings
    - Customize your meeting view
    - Change background effects in Teams meetings
    - Reduce background noise in Teams meetings
    - 5 tips for using Teams when you're deaf or hard of hearing

- Meeting Recordings:
  - NW Natural will record IRP virtual meetings and will post them to the NW Natural website on the integrated resource planning webpage

# Introductions

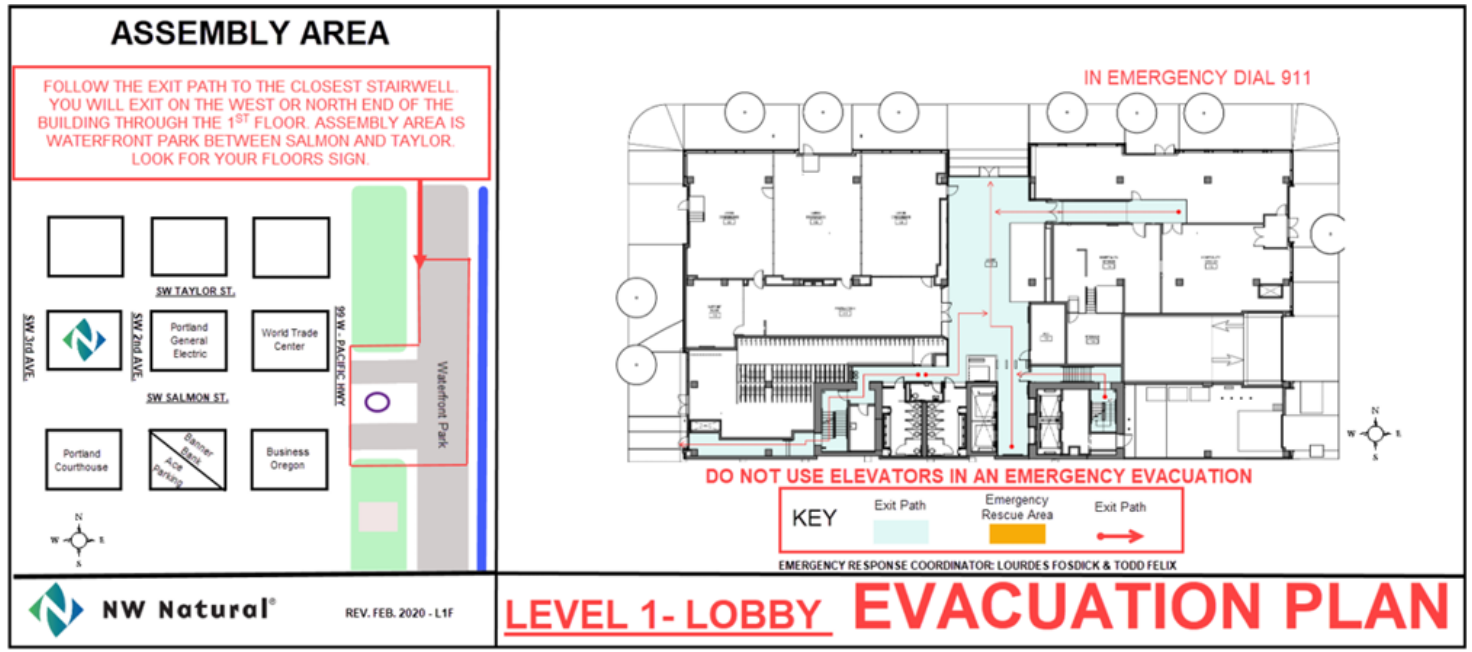
## Core NW Natural IRP Team*

| Tamy Linver | Matt Doyle | Haixiao Huang | Melissa Martin | Mike Meyers | Taylor Nickel | Kyle Putnam |
|---|---|---|---|---|---|---|
| *Sr. Director of Strategic Planning* | *Director of Integrated Resource Planning* | *Economist* | *Project Specialist* | *Economist* | *Data Scientist* | *Economist* |

*but it takes a village to pull together an IRP and we pull in many subject matter experts from other departments as needed.

# Two Minutes for Safety: Evacuation Routes

- Important to know the evacuation route and plan for any place you are staying *(including your home or workplace)*
- Routes often posted near entries/exits and/or in centrally located areas
- Being aware and prepared helps you stay calm and act quickly during an emergency event



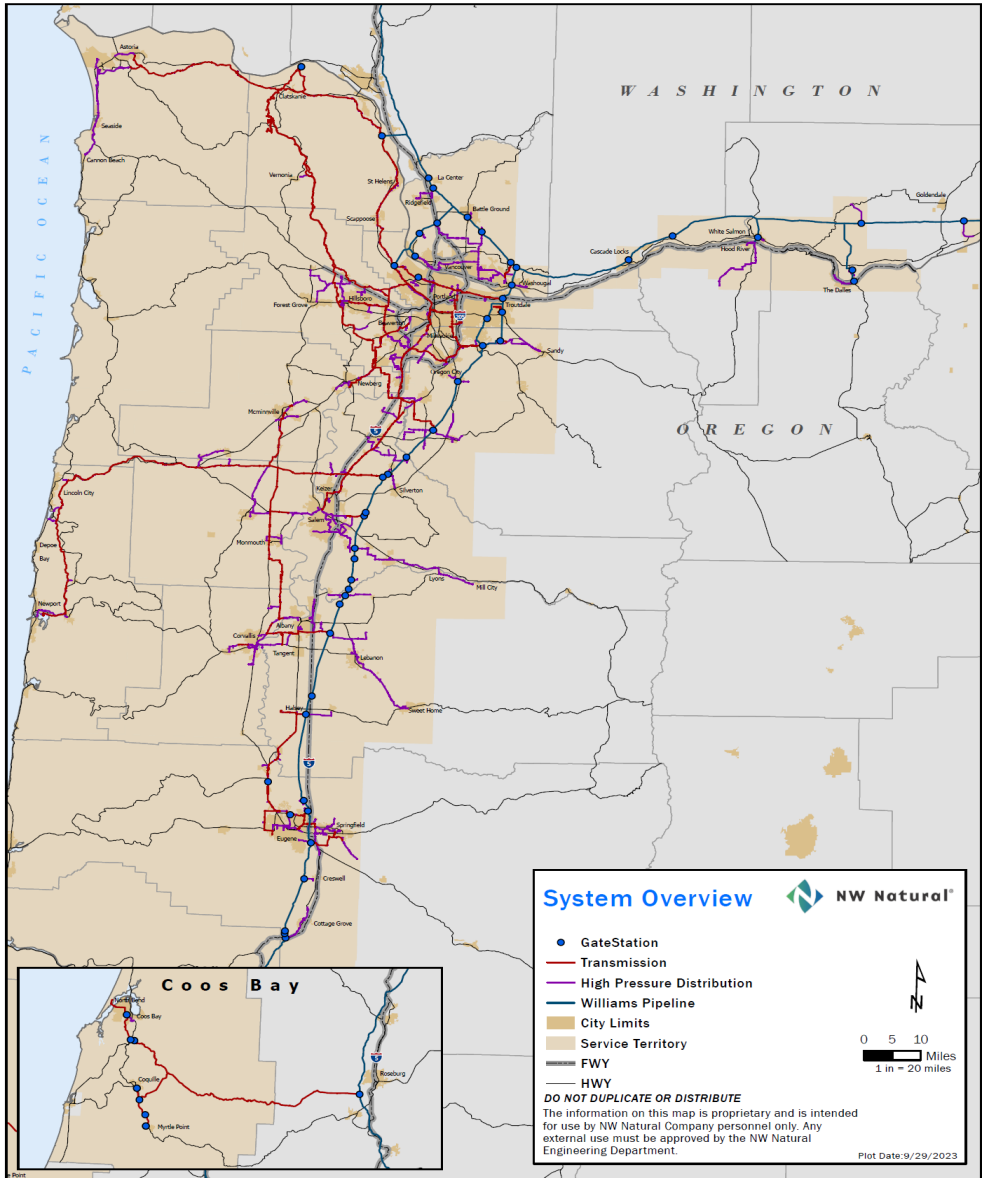
# What do you know about NW Natural?

# Who is NW Natural?


- 165-year-old Oregon company
- Over 800,000 customers
  - 88% Oregon
  - 12% Washington
- Operates in 2 states, 18 counties, 140 different communities
- More than 1,200 employees

# NW Natural's System

- 14,420 miles of transmission and distribution main
  - 86% Oregon
  - 14% Washington
- 54 Gate Stations
- Approximately 1,050 Regulator/Regional Stations
- 2 LNG Storage Plants
- Mist Underground Storage Facility




*Prepared for IRP Open House - Not to be used for investment purposes.*

# We are a Local Distribution Company
# What does that even mean?

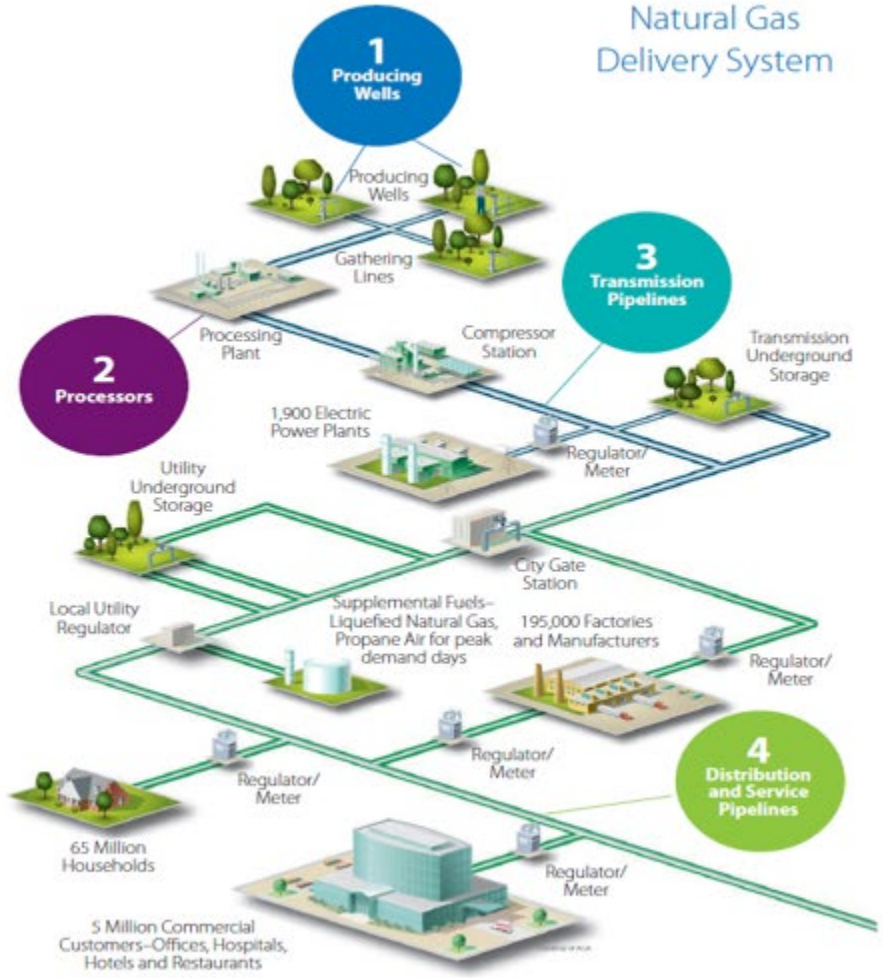
There are four segments of the natural gas industry involved in delivering natural gas from the wellhead to the consumer

**1. Producing Wells (producers)** such as Anadarko, BP, Devon, ExxonMobil and others, access natural gas by drilling wells into the rock then using pipes to bring the gas to the surface. In most wells, the pressure of the natural gas is enough to force it to the surface and into the gathering lines that run to central collection points. Where the gas can't flow naturally, advanced drilling technology combined with hydraulic fracturing is used to bring gas to the surface.

**2. Processors** (midstream companies), like Enbridge, TransCanada and Williams typically connect the various producing wells via a raw-gas-gathering network of small diameter pipelines, and process the gas to transmission pipeline specifications.

**3. Transmission Pipelines,** such as Enbridge's BC Pipeline, TransCanada's GTN System and Williams NW Pipeline, act like interstate highways for gas, moving huge amounts of natural gas thousands of miles from production regions to market regions served by local distribution companies. Compressor stations located about every 50 to 60 miles boost pressure to counter what is lost from the friction of gas moving through the pipe.

**4. Distribution and Service Pipelines** (local distribution companies), such as those operated by Avista, Cascade Natural, FortisBC Energy, Intermountain, NW Natural, and Puget Sound Energy, are where the familiar "rotten egg" smell is added to natural gas before it is delivered to homes and businesses through distribution mains (utility pipelines). Finally, after passing through a meter that measures use, the gas travels to a customer's equipment, appliances and vehicles.



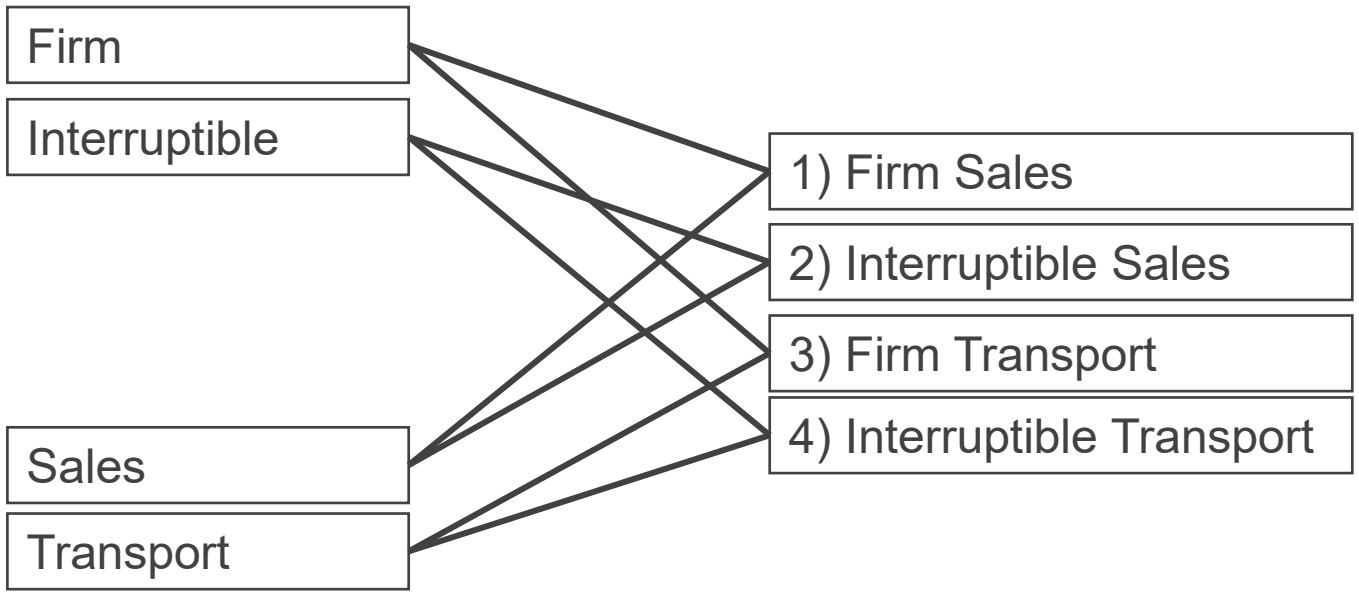

Source: Adapted from Northwest Gas Association

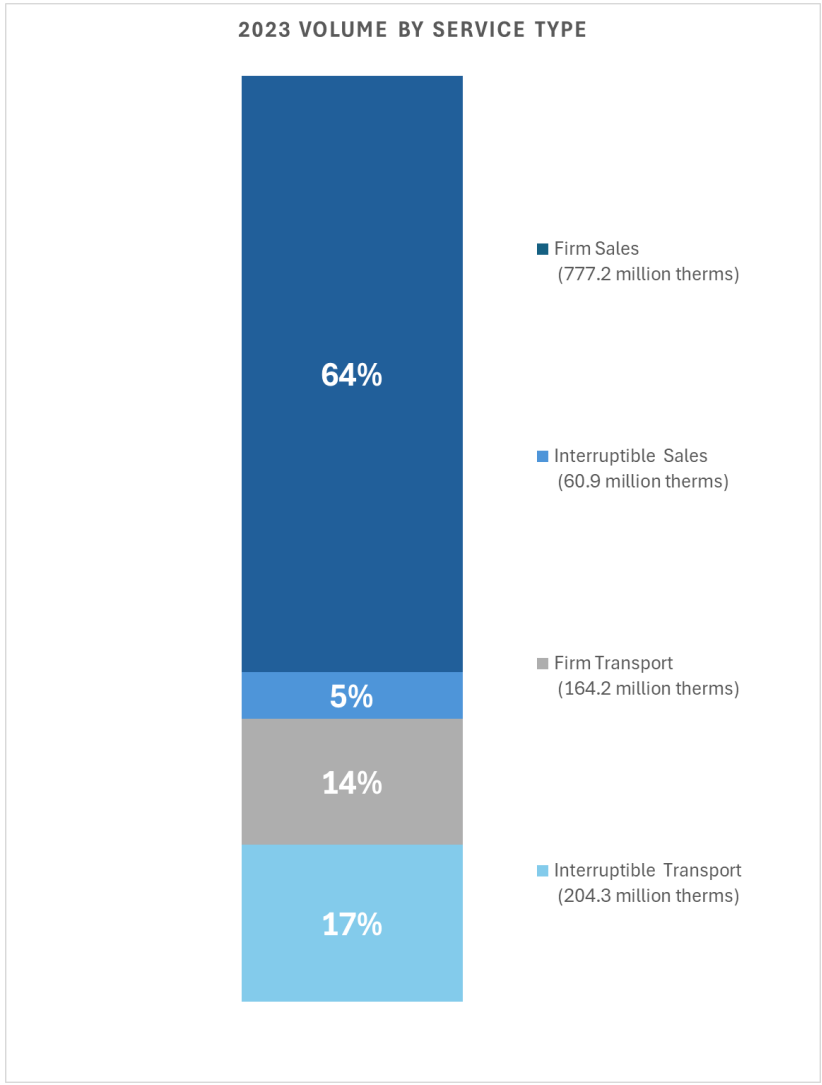
# Our Customers

# Types of Services NW Natural Offers

NW Natural®

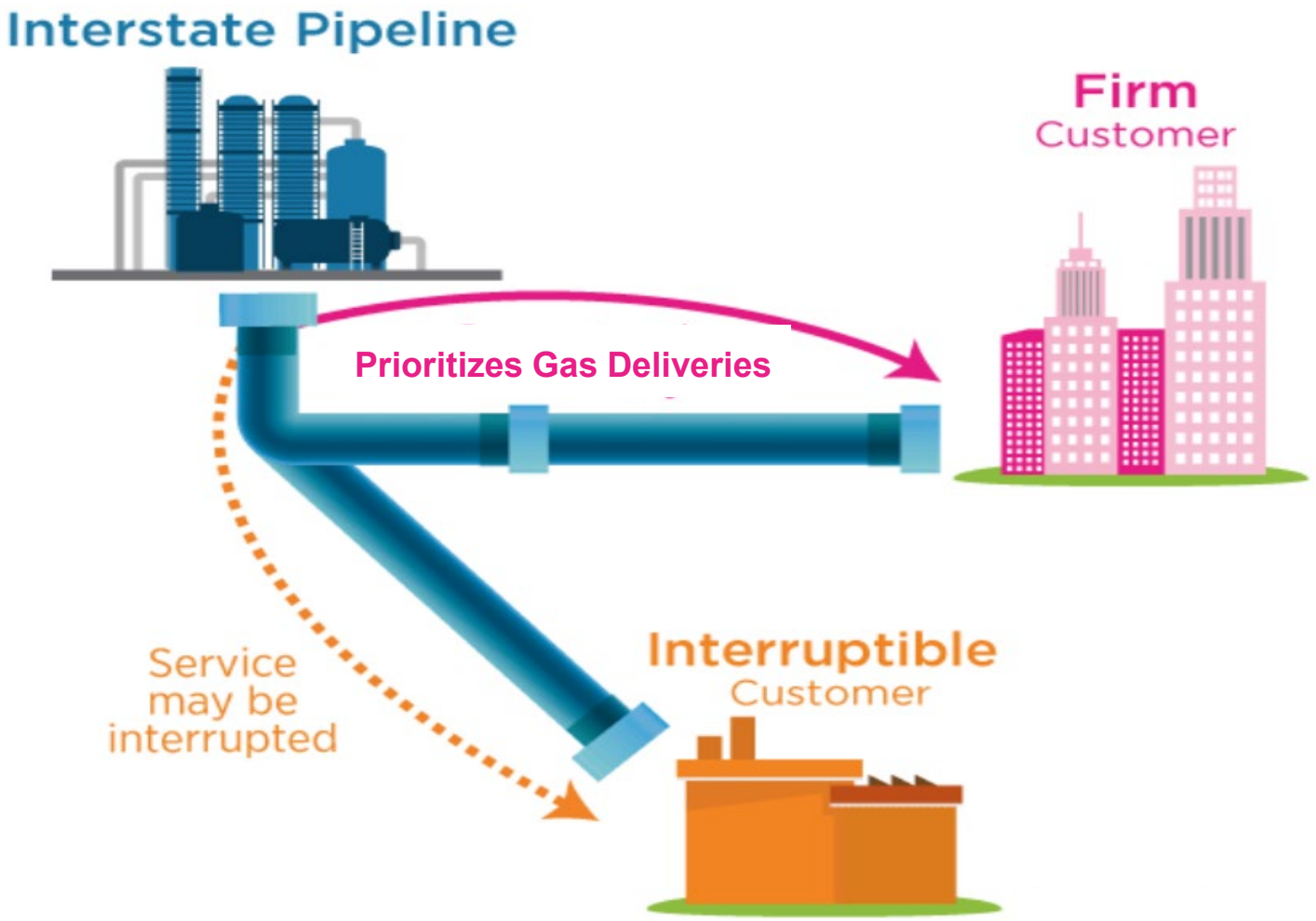
## There are 4 Main Types of Service



# Types of Services NW Natural Offers

## Firm vs. Interruptible




Source: Graphics adapted from https://learn.pjm.com

### 1. Firm

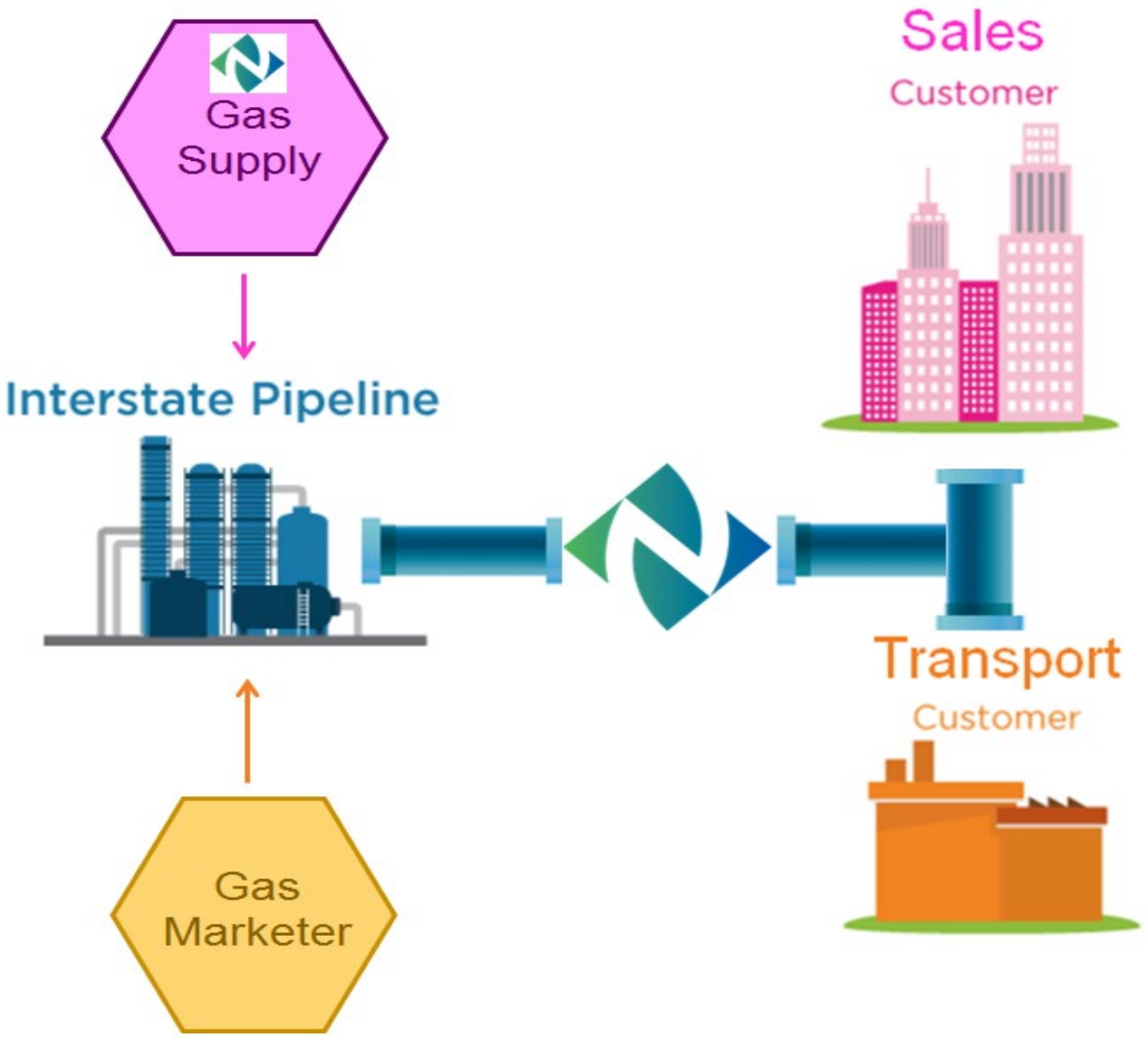
- NW Natural prioritizes continuous delivery of gas
- Typically, all Residential, most Commercial, very small amount of Industrial Customers

### 2. Interruptible

- NW Natural delivers gas at a lower rate, but the customer may be interrupted
- Typically, large Commercial or Industrial Customers

# Types of Services NW Natural Offers

## Sales vs. Transport




### 1. Sales

- NW Natural acquires the gas commodity on behalf of customer
- Typically Residential, most Commercial, some amount of Industrial

### 2. Transporters

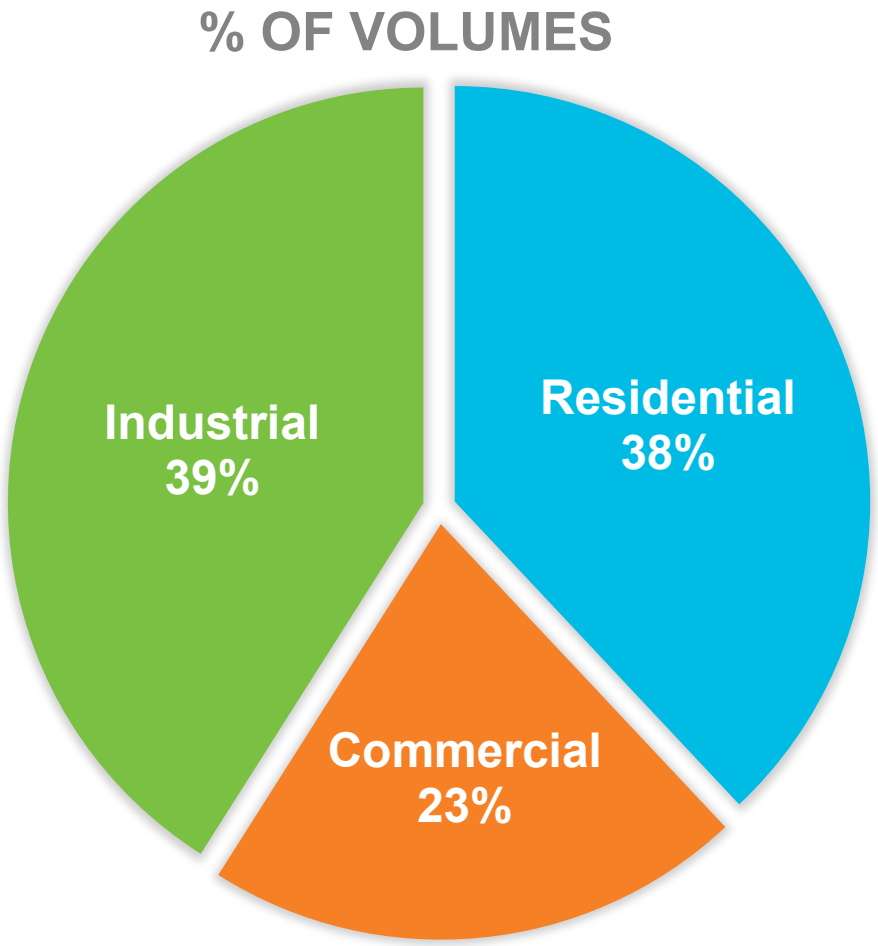
- Customer uses a third-party marketer to acquire gas commodity
- Typically, large Commercial or Industrial

# Types of Customers

## Approx. Customer Counts

| | | |
|---|---|---|
| Residential | 731,497 | 91% |
| Commercial | 69,390 | 9% |
| Industrial | 1,056 | <1% |

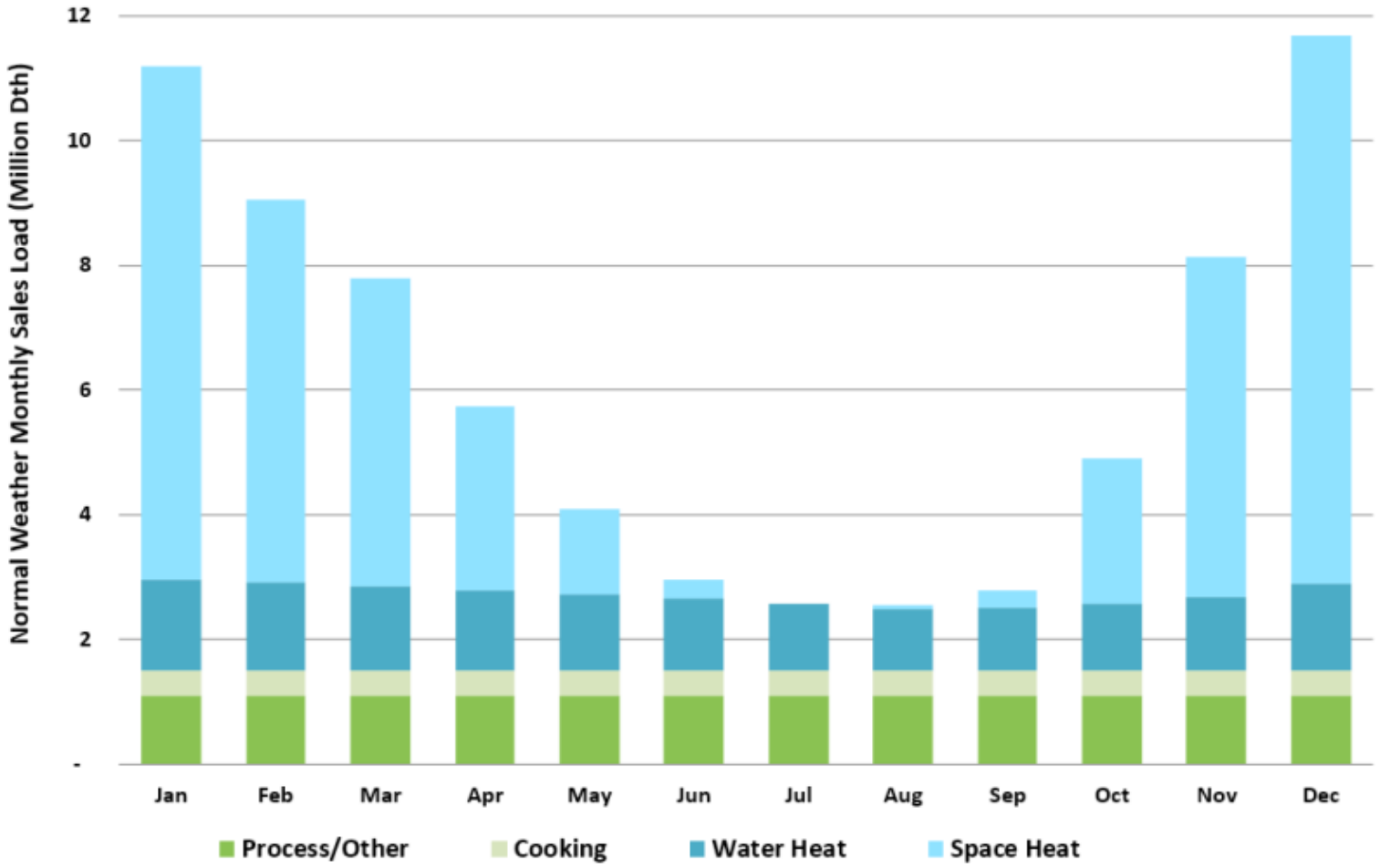
Source: NW Natural 2023 10-K




Source: NW Natural 2023 10-K

# How do our sales customers use natural gas?

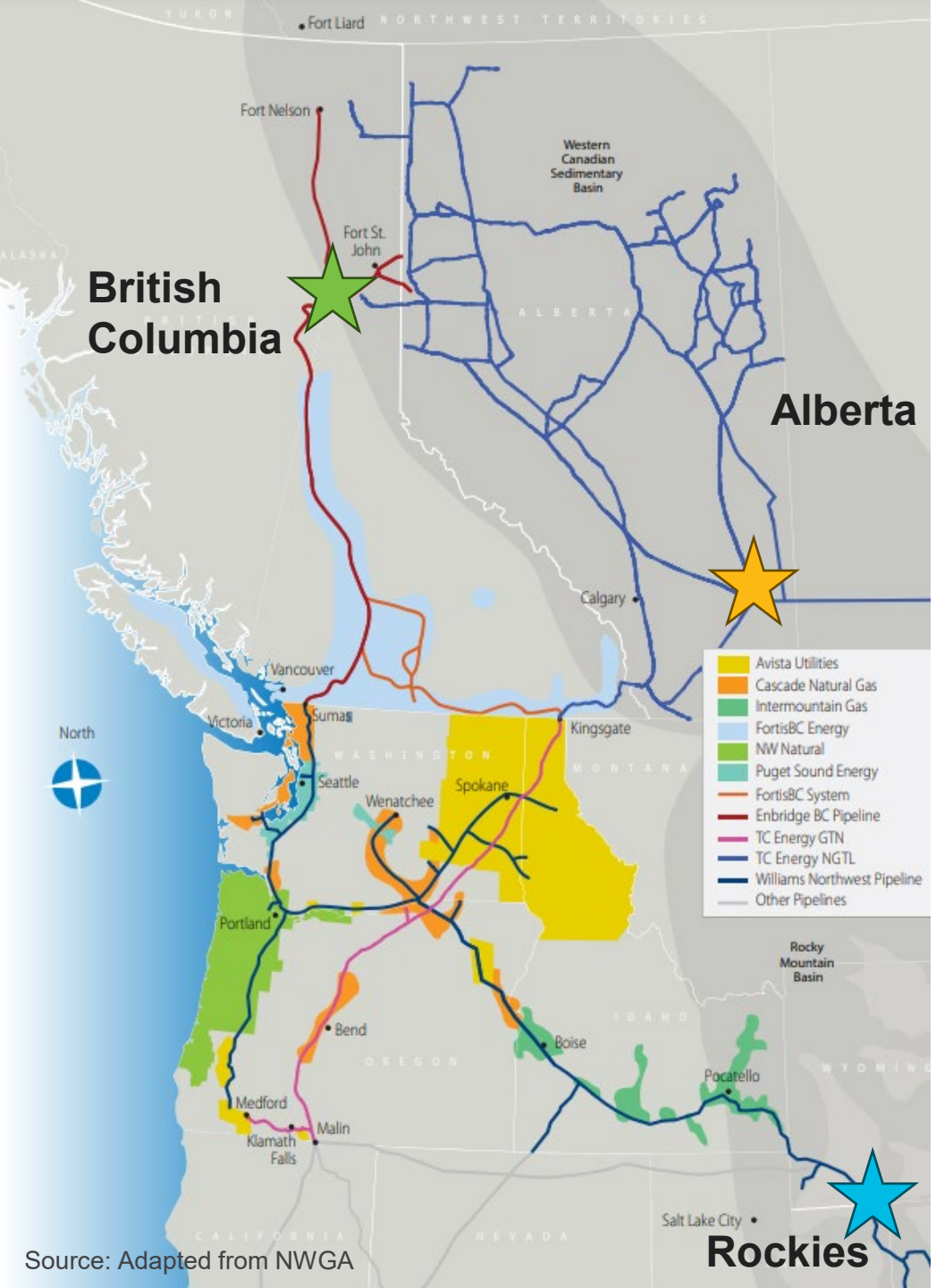
*Figure 1.6: Monthly Sales Load by End Use*




*Source: 2022 NW Natural Integrated Resource Plan*

- "Sales" load is a bundled service where NW Natural provides both the natural gas commodity and delivery services. NW Natural's other offering "transportation" only provides the does not include the sale of the natural gas commodity

# Our Gas Supplies




Source: Adapted from NWGA

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# NW Natural Gas Purchases

All conventional gas purchases ultimately travel through interstate pipelines to our service territory

- 1/3 from Alberta
- 1/3 from British Columbia
- 1/3 from U.S. Rockies

# Gas Supply Diversity

NW Natural

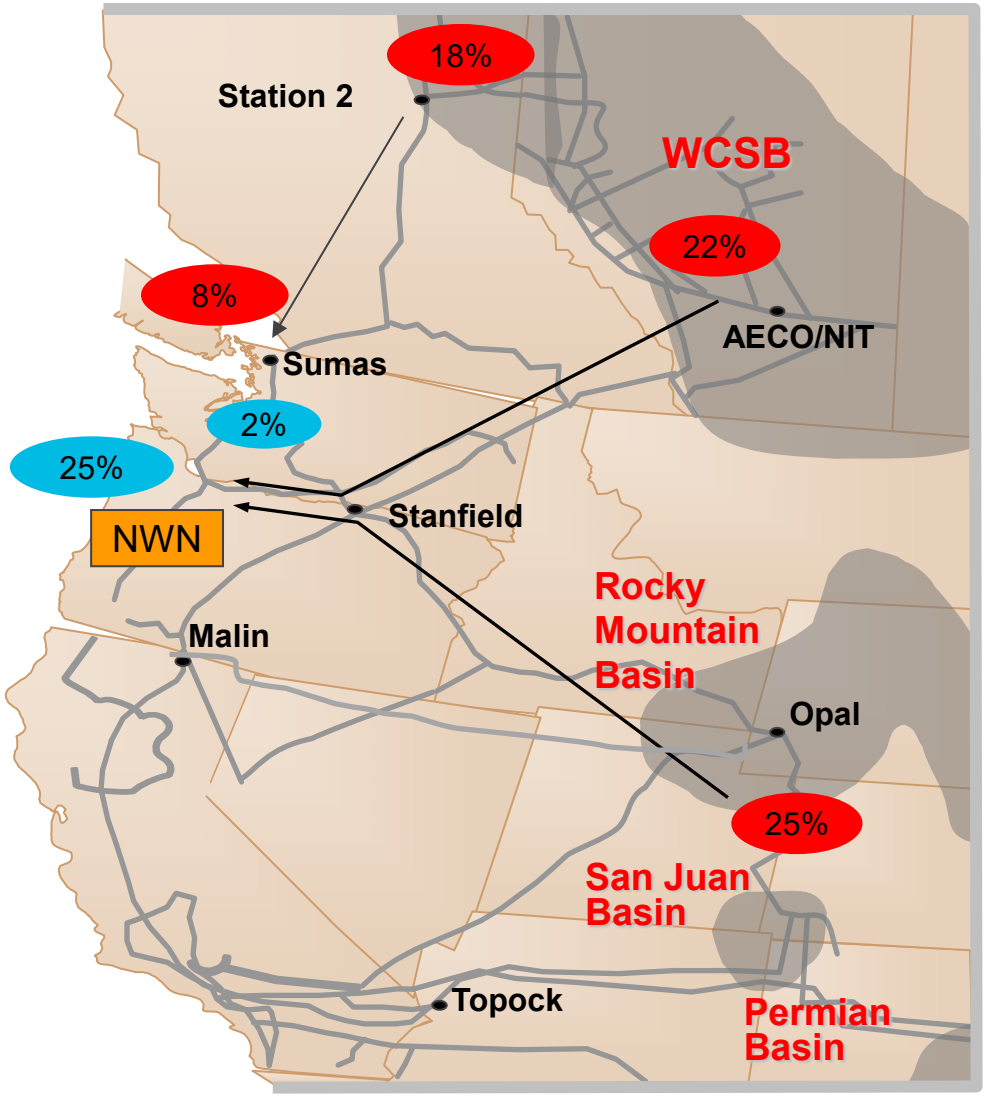
**Average Winter Day**

Flowing Supplies

Underground Storage

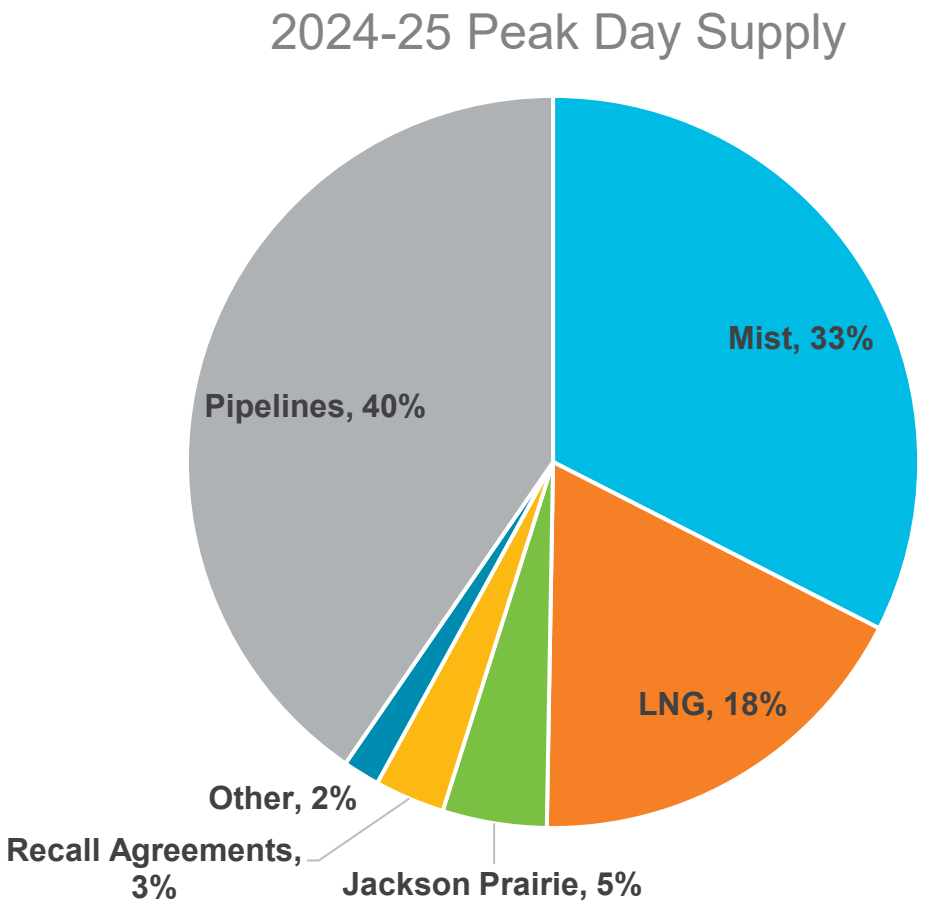
NW Natural also owns and operates two LNG Plants:

- Portland LNG, in-service starting 1969
- Newport LNG, in-service starting 1977
- Key resources for peak days
- Not shown on this chart because LNG usage is zero on an average winter day



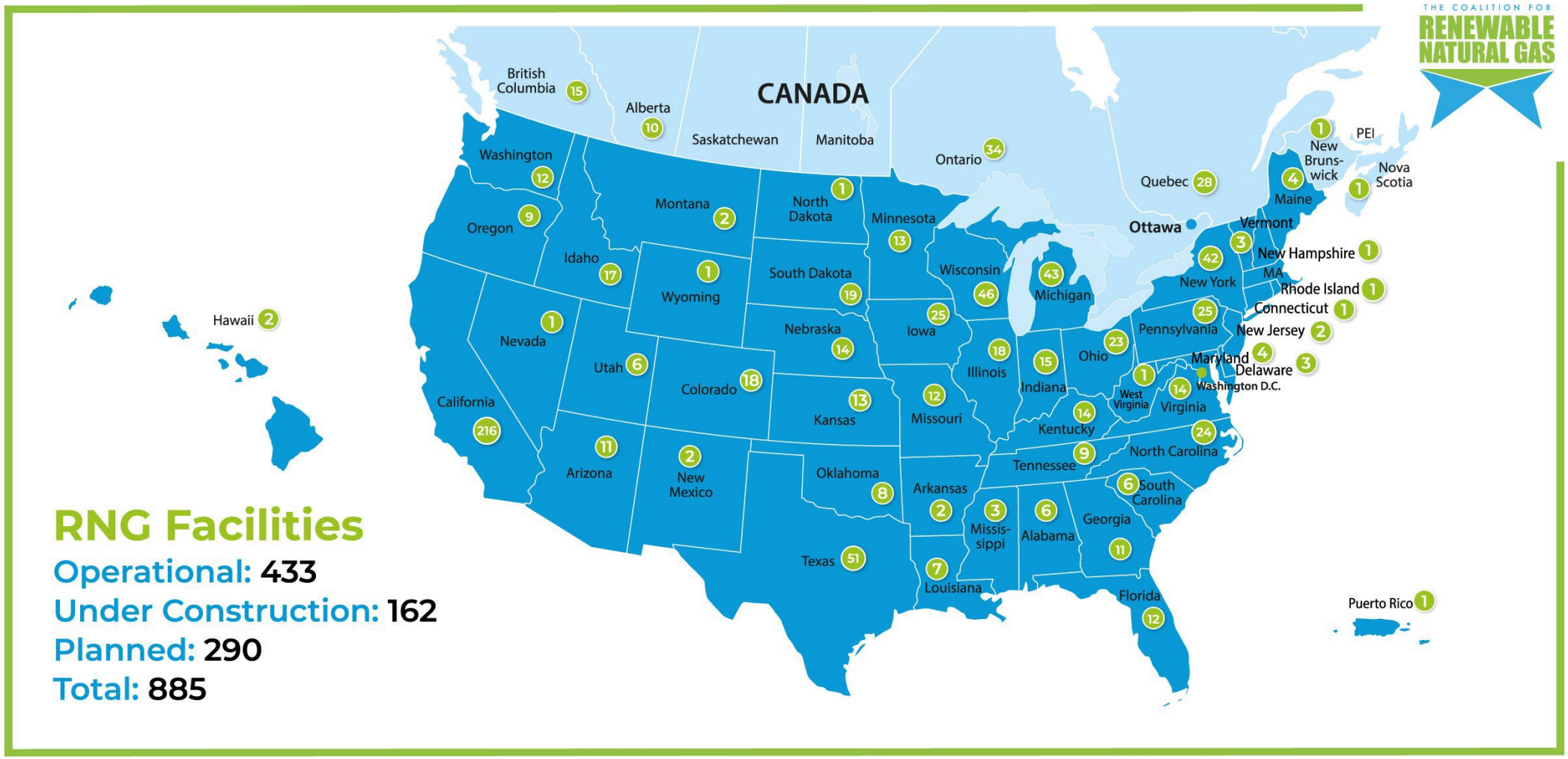
# Gas Supplies are in place to serve peak demand of one million Dth this winter

- Over half of our peak day supplies come from on-system storage, providing excellent resilience
- Our planning assumes all resources are available at their maximum output, so they need to be reliable
- We had our first Mist recall since 2015 this year which increased the Mist allocation to customers



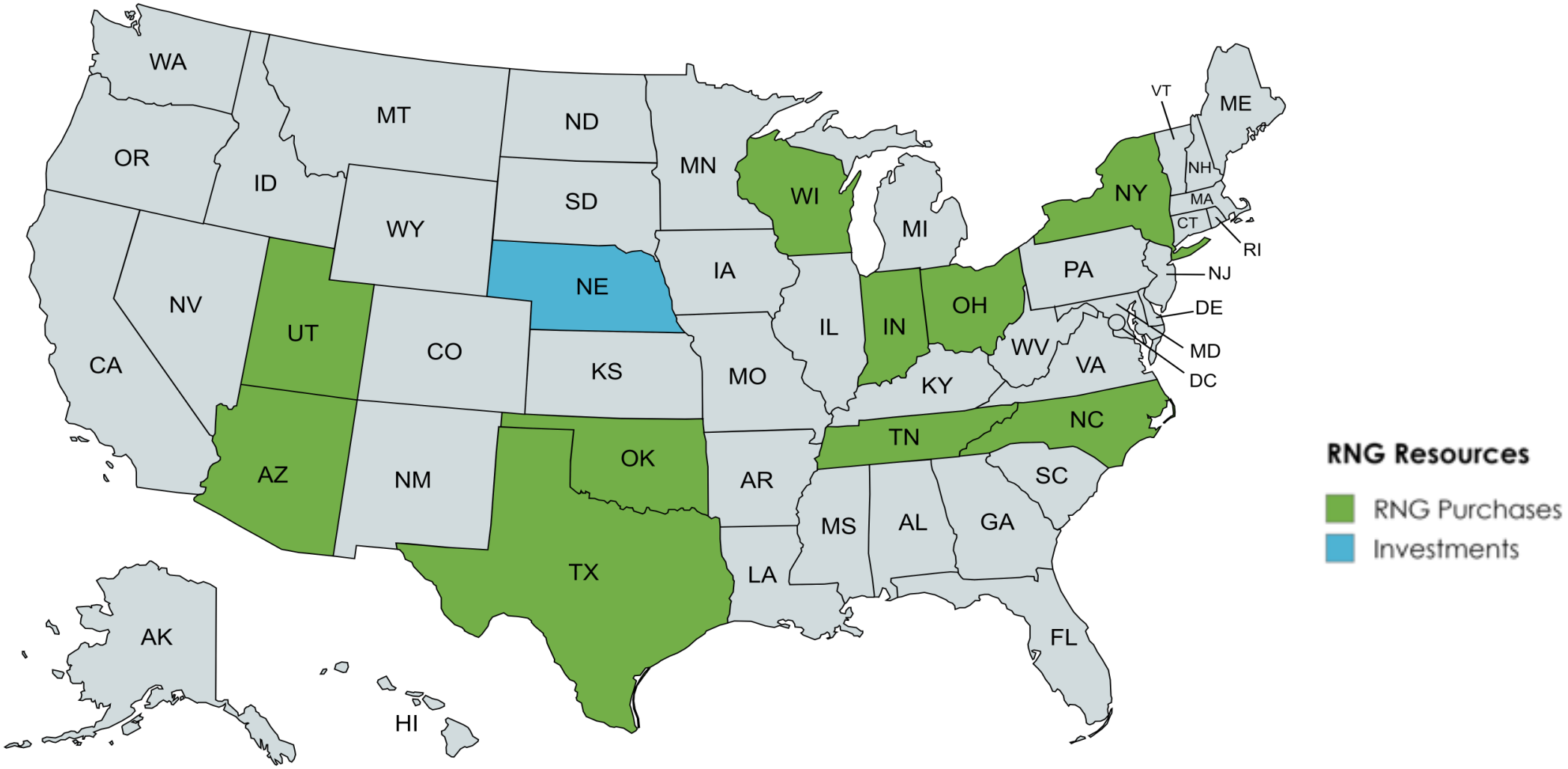
# Our Renewable Gas Supplies

# RNG: Operating Facilities




"This (…) represents a significant leap from just a year ago, when the North American RNG industry celebrated the establishment of 300 facilities, marking a remarkable 44% growth within just one year."

# Renewable Natural Gas Resources



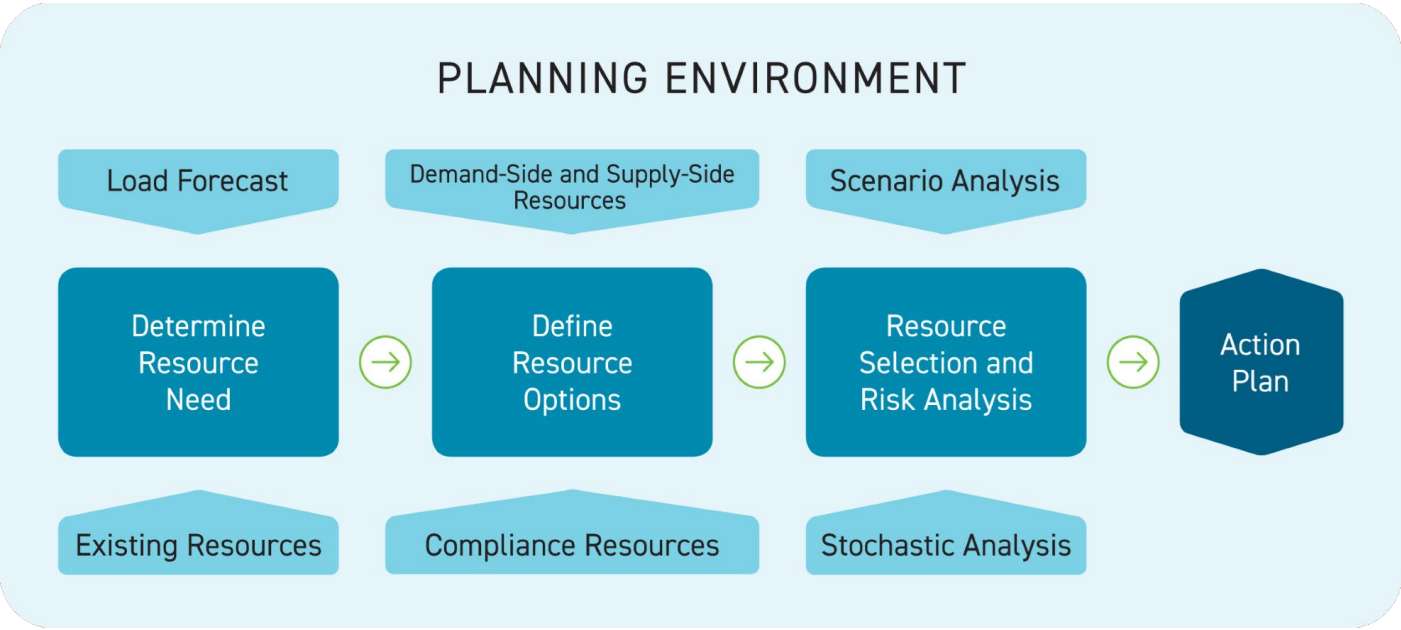
# What is Integrated Resource Planning?

# What is Integrated Resource Planning?

- The Integrated Resource Plan (IRP) starts with the current customer base **(where we know we are today)** and evaluates the near and long-term decisions required to reliably serve customers energy needs into the future **(what energy services will our customers need in the future)**

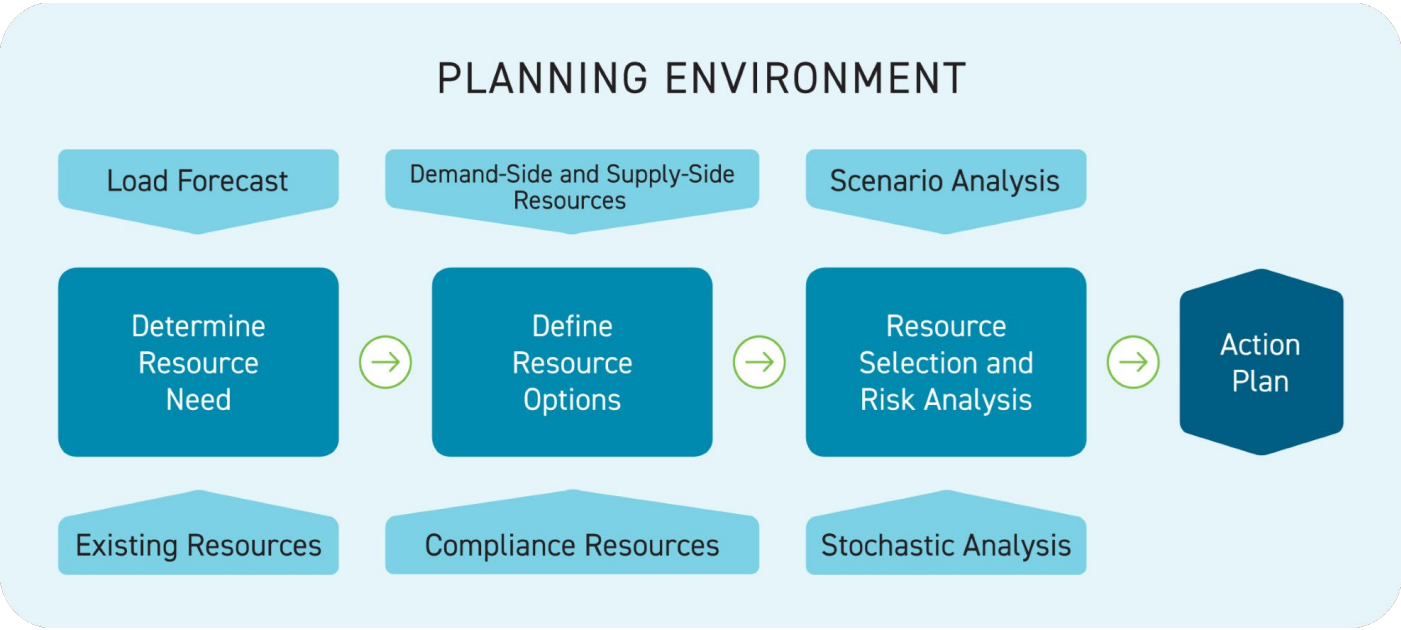
- The IRP assesses a suite of resource options to inform actions that represent the **best combination of cost and risk** to the utility and its ratepayers.

- Required compliance document with state commissions



# What is Integrated Resource Planning?

- The IRP incorporates compliance with Federal, State and local policies, which are driving conservation efforts and decarbonizing the fuel we deliver
- Filed about every two years in both Oregon and Washington
- Covers ~20-year planning horizon (out to 2050)
- Includes a short-term “Action Plan” covering the following two to four years



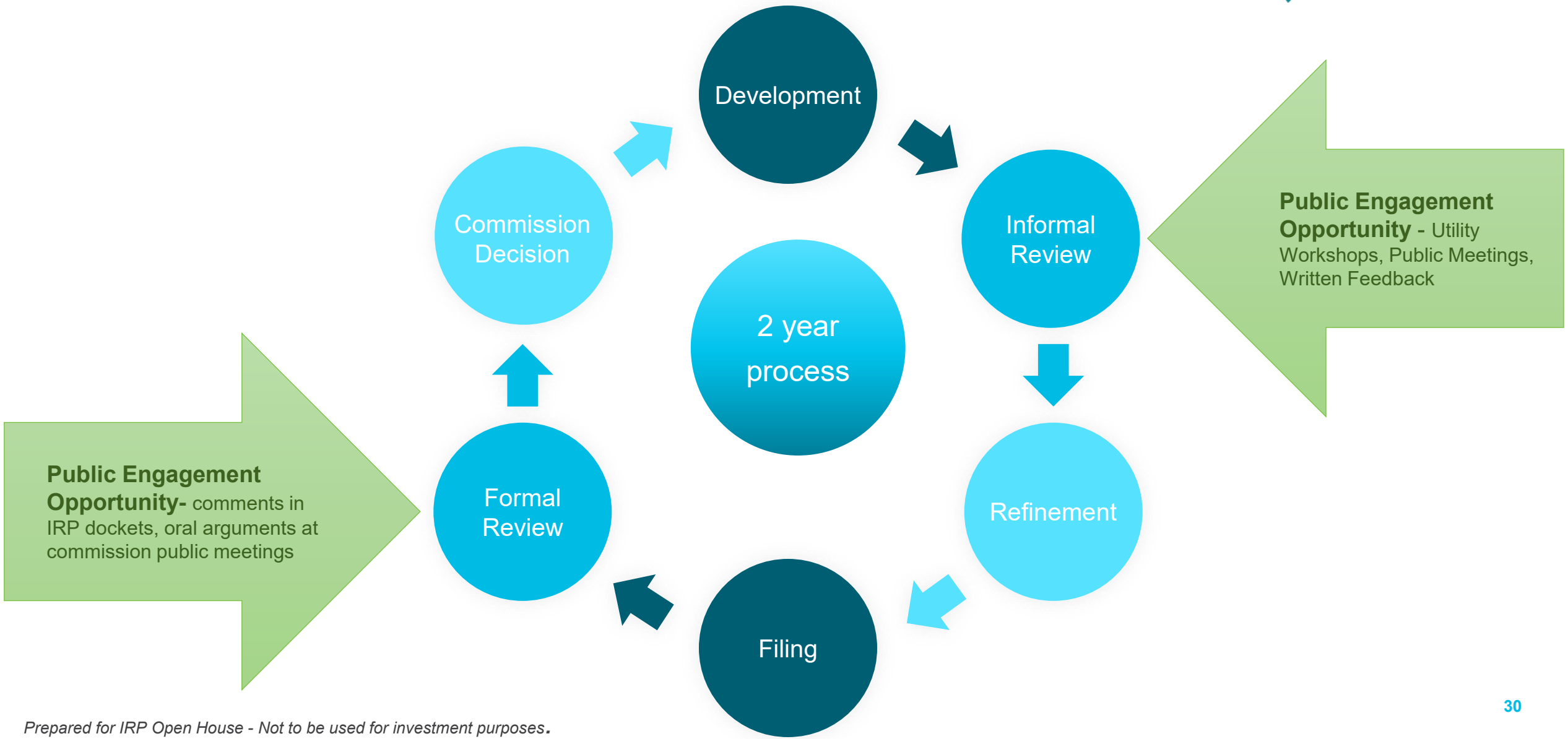
# What is required in an IRP?

| Process Requirements |
| --- |
| Filing Cadence |
| Planning Timeline (horizon) |
| Public Participation |
| Draft and Final Plans |
| Updates to Plans |
| Commission Review of Plans |

- Educate the public about how NW Natural is thinking about different challenges/pathways
- Effectively communicate with Commissions/Stakeholders
- Obtain and incorporate feedback from state regulators, stakeholders, and the public into current or future IRPs

| Analytical Requirements |
| --- |
| Load Forecasting (demand) |
| Resource Options (supply) |
| Costs of Investments, Resources, & Compliance |
| Customer Trends |
| Scenario and Sensitivity Analysis (risk and uncertainty) |
| Conservation Potential (energy efficiency) |
| New Technologies |
| Local, State, Federal Policies |
| Preferred Portfolio |
| Short-term Action Plan |
| Analysis as Directed by Commission |

# IRP Cycle



# NW Natural IRP Engagement Opportunities
# We have added 3 new streams

- **Technical Working Groups (TWGs)**
  - Focus on presenting analytical requirements & soliciting feedback
  - Open to the public
  - Facilitated by third-party
  - Held virtually; Recorded and posted to IRP webpage

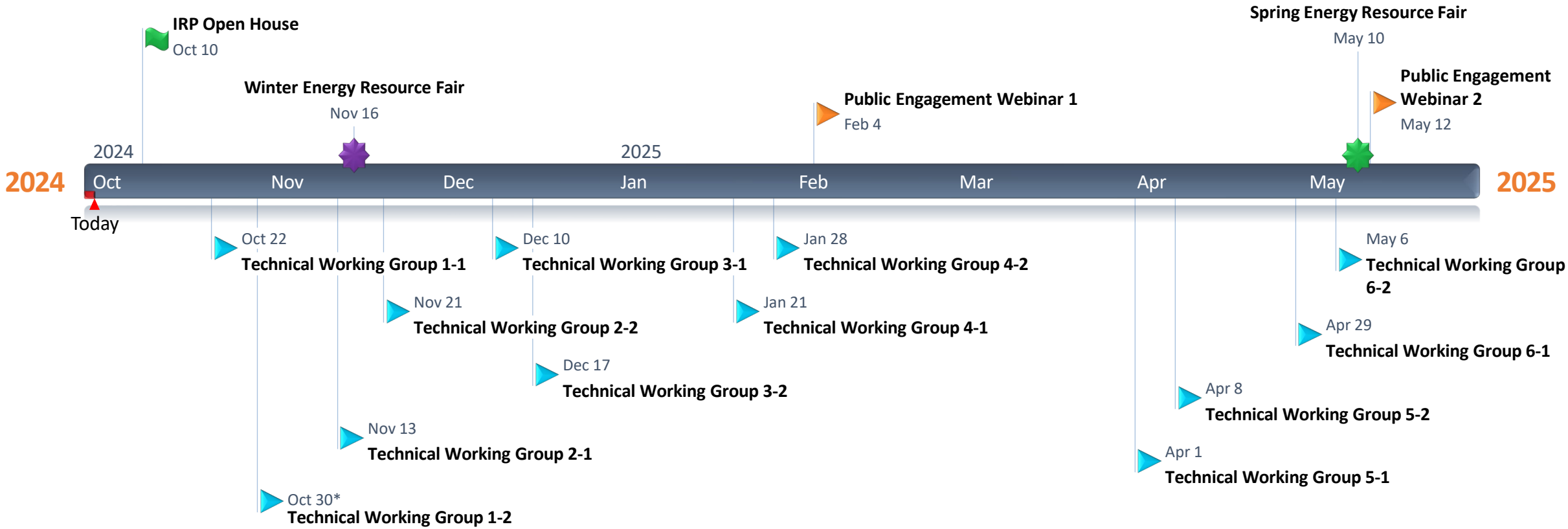
- **Public Engagement Webinars**
  - Focus on informing & educating
  - Open to the public
  - 60–90-minute webinars
  - Topics at higher-level than TWGs
  - Recorded and posted to IRP webpage

- **Energy Resource Fair**
  - Focus on informing & educating
  - In-person resource fair
    - Tables covering a range of topics, resources, and programs
  - Open to the public (family activities included!)
  - Partnered with local organizations

- **Feedback Form, IRP Contact, Office Hours**
  - Feedback form to be made available through IRP webpage (or direct link provided during meetings/webinars)
  - IRP Team direct contact: IRP@nwnatural.com
  - Team may host office hours as needed during development

More information: https://www.nwnatural.com/about-us/rates-and-regulations/integrated-resource-plan

# NW Natural IRP Stakeholder Engagement Dates




*Prepared for IRP Open House - Not to be used for investment purposes.*

*Subject to change

# IRP Tools
# System Planning

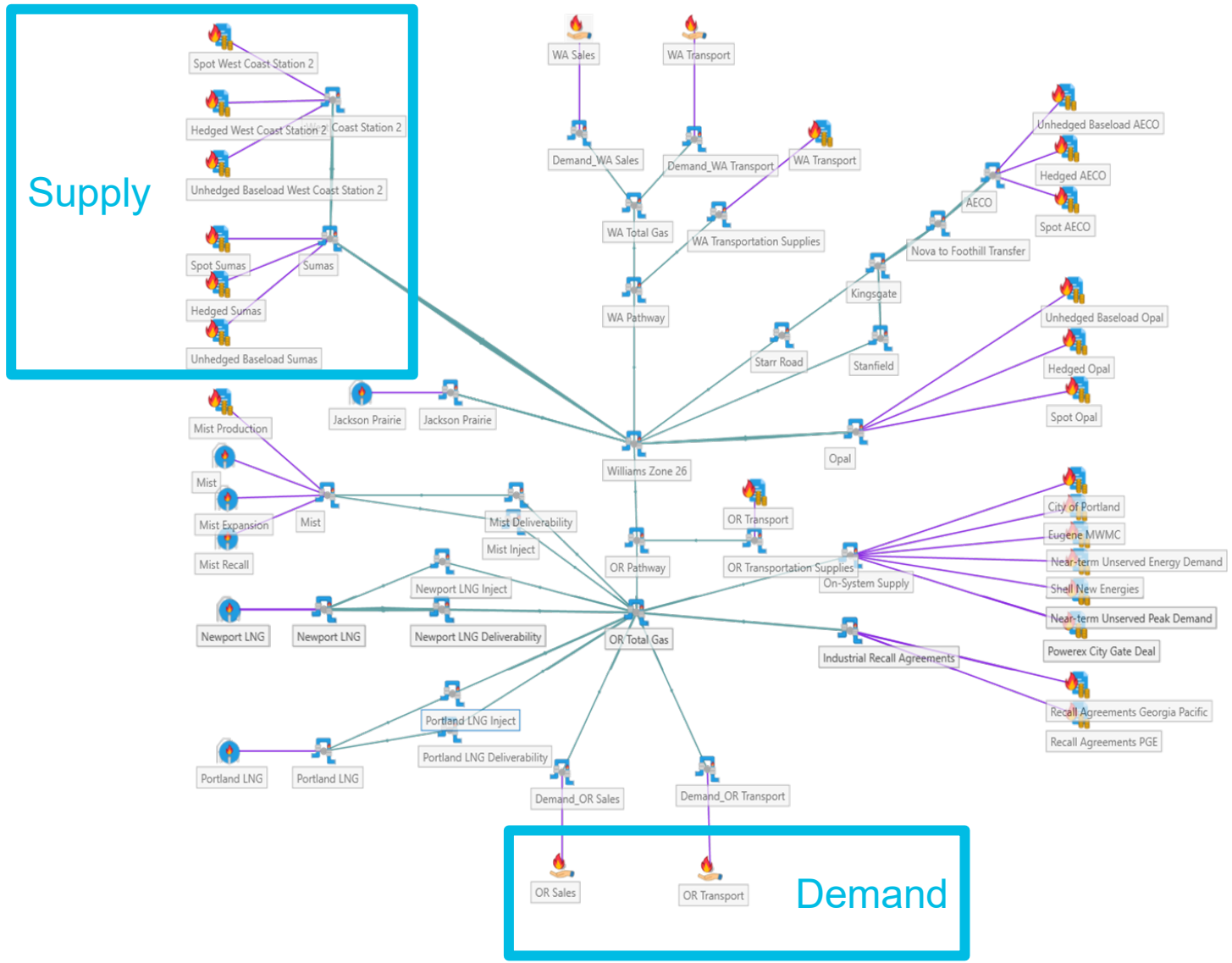
# What is PLEXOS?

| Decision Variable | Constraints |
|---|---|
| ➢ Daily purchases for compliance resources (RNG, hydrogen, synthetic methane) and compliance instruments (CCI, allowances, offsets)<br>➢ Daily selection of quantity and location to purchase and ship conventional gas<br>➢ Daily Mist, Jackson Prairie, Portland LNG and Newport storage operations (injections and withdrawals)<br>➢ Annual acquisition of capacity resources required to serve demand | ➢ All demand is served in each load center<br>➢ NW Natural meets emissions compliance in both Oregon and Washington<br>➢ Pipeline constraints and costs<br>➢ Storage constraints and costs<br>➢ Supply purchasing constraints and costs<br>➢ Compliance and capacity resource acquisition constraints and costs<br>➢ Costs are discounted at a rate equal to the Company's real after-tax weighted cost of capital |

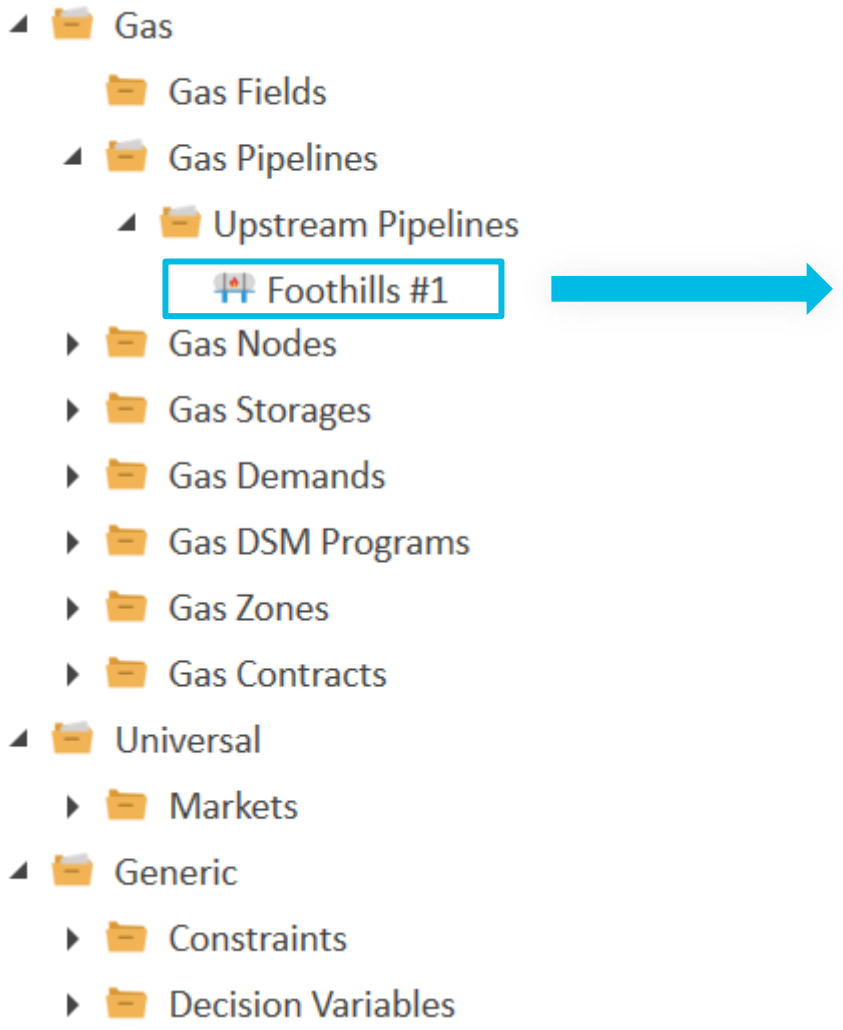
- PLEXOS is a software that was developed by Energy Exemplar. It is widely used by the utility industry, and was also used by NW Natural in our 2022 IRP
- PLEXOS is a **resource planning optimization model** that solves to determine the least-cost mix of resources while complying with policy and reliably serving customers across the planning horizon (2025-2050).
- Scenarios and stochastic simulations are used in the risk analysis to determine the least-cost, least-risk solution for near-term action items.

# PLEXOS System Model Diagram

- The PLEXOS connects sources of supply to sources of demand
- We build into the model as many operational constraints into the model as possible
- Given these constraints, the software solves the for least cost way to serve demand



# PLEXOS Inputs




| Parent Object | Child Object | Property | Value | Data File | Units |
|---|---|---|---|---|---|
| System | Foothills #1 | Flow Charge | 0 | Pipeline_Flow Charge | $/MMBtu |
| System | Foothills #1 | Reservation Charge | 0 | Pipeline_Reservation Charge | $/MMBtu/month |
| System | Foothills #1 | Reservation Volume | 0 | Pipeline_Reservation Volume | MMBtu |
| System | Foothills #1 | Loss Rate | 0 | Pipeline_Fuel Rate | % |
| System | Foothills #1 | Entitlement Type | Net | | - |
| System | Foothills #1 | Max Flow Day | 1E+30 | Pipeline_Reservation Volume | MMBtu |

# IRP Tools
# Distribution System Planning

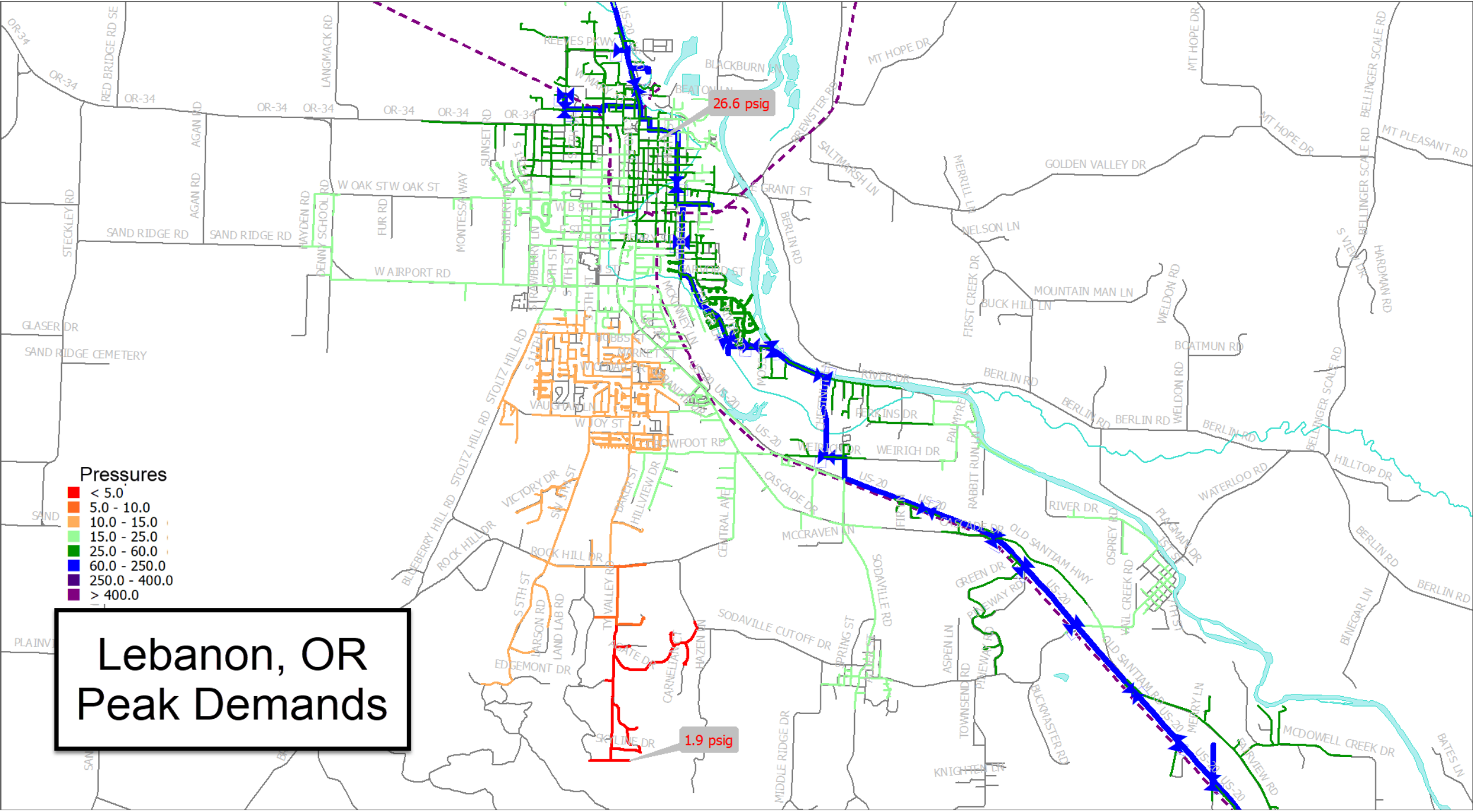
# Synergi Gas™

- Hydraulic Modelling Software used to Analyze Networks of Pipes, Regulators, Valves, and Compressors
- Models Consist of
  - Supply – Gate Stations and Storage
  - Pipeline Topology – Pipes, Pressure Regulating Equipment, Configuration
  - Pipe Attributes – Diameter, Wall Thickness, Length, Material, and Maximum Allowable Operating Pressure
  - Demand – Customer Load
- Cold Weather Planning – Identify Low Pressures Areas
- New Gas Sources and Blends, Including RNG and Hydrogen
- Verify & Calibrate Models with SCADA, Pressure Recorders, and Cold Weather Pressure surveys

# Customer Management Module (CMM)

- Provides a Connection Between GIS, CIS and Synergi Gas
- Calculates Individual Customer Demands Based on Recent Monthly Historical Usage and Weather Data
- Connection Between GIS, CIS and Synergi Gas Provides Automation Benefits
  - Customer Information Updates
    - Demand Changes, New Customers, Customer Disconnections, Rate Schedule Changes
    - Demands Can be Automatically Assigned for Each Customer to Specific Pipes in Synergi Models

***CMM Models Have Been Created for ALL Systems***


Pressures
< 5.0
5.0 - 10.0
10.0 - 15.0
15.0 - 25.0
25.0 - 60.0
60.0 - 250.0
250.0 - 400.0
> 400.0
Lebanon, OR
Peak Demands
26.6 psig
1.9 psig


# Questions / Feedback

Strategic Planning | Integrated Resource Planning Team

irp@nwnatural.com

# Tour Time