Planning Environment for the 2022 IRP- Technical Working Group

TWG #1- Planning Environment and Environmental Policy
January 14, 2022

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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.

Today's Agenda

- Procedures and Introductions
- Introduction to NW Natural's IRP
- Lunch Break (12pm-1pm)
- Planning Environment
- Scenario Discussion

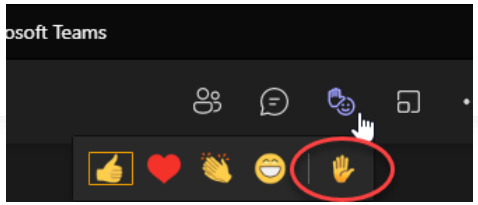
Procedures for Participation

- Please mute your microphones during the presentation, except when commenting and or asking a question
- All participants are muted upon entry into the meeting

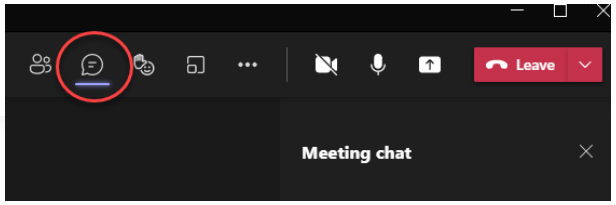
- Cameras are optional and up to each participant to use
- All participant cameras are set to off upon entry into the meeting

- Add a comment or question at any time using the “raised hand” or the chat box

Raised hand function is found in the reactions

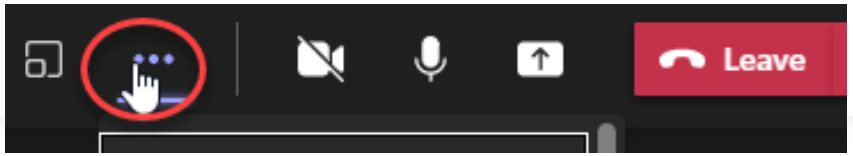


Chat box will open when you click on the conversation bubble



- Microsoft Teams has a live caption function for any participant to use

Click the ellipses, then chose “turn on live captions”



Take 2 Minutes for Safety:

Winter Vehicle Safety

Winter is here and, in the Pacific NW, we can encounter varying weather day to day. It can be easy to put off preparing for poor and or unexpected driving conditions.

In your vehicle, keep on hand:

- Ice Scraper and Small Shovel
- Spare Tire & Accessories: Chains or Snow Socks (that fit your vehicle)
- Jumper Cables & Flares
- Warm Layers
- Non-perishable Food and Water
- Flashlight and Batteries
- First Aid Kit
- Salt, Sand, or Cat Litter for extra traction

Before Heading Out:

- Inspect your vehicle
  - Are all lights working?
  - Are tires in good condition?
  - Have you checked wipers, coolant, and other systems?
- Refresh your memory on how to safely drive on snow and ice
- Check traffic and road conditions

On the Road:

- Always buckle up
- Drive slowly
- Lights on (especially if low light and or wipers are in use)
- Give space to yourself and others sharing the road
- Be mindful of hazards for pedestrians such as snow berms

IRP Process, Objectives, and Evolution

The IRP process is a public process and we welcome your feedback and participation!

- IRP participants come to the process with varying backgrounds and familiarity with IRP planning, and that is ok! Our IRP benefits from diverse perspectives
- We strive to strike the right balance in terms of the technical material presented, but are always evaluating the appropriate level of detail and might not always get it right

NW Natural's views on scope and role of the IRP:

- Rules and guidelines from the legislature and our regulatory commissions define the scope and purpose of IRPs and are grounded in a least cost-least risk approach to utility resource planning
- IRP rules and guidelines require robust planning that is highly complex and requires advanced modeling techniques and tools that are critical to serving our customers' needs as best we can
- IRPs assess the implications of the policy and market environment and how changes to that environment would impact meeting customer needs
- The IRP process is not a policy *making* process nor the best forum to discuss what policies should (or should not) be adopted

NW Natural acknowledges that IRPs are evolving and the active discussions about the role of IRPs and ways to make the process more inclusive and transparent as well as coordinate work across utilities

- We are proactively looking at ways to improve our IRP process and outreach and are excited to be able to lean on the experience and expertise of the Community and Equity Advisory Group NW Natural is forming moving forward

We value open and constructive discussion and IRP workshops are *LONG* meetings; we are bound to misspeak from time to time and we apologize in advance!

Community & Equity Advisory Group

Background & Development Status Update

- NW Natural has a long history of community involvement throughout its service territory & has a commitment to diversity, equity, and inclusion.
- The Company is working to formulate a Community & Equity Advisory Group (CEAG) to advise on system planning processes, & other key company programs and initiatives.
- Broad panel of representatives from Community Based Organizations (CBOs)
  - Representatives from WA & OR
  - 10-15 representatives; compensated

NW Natural Commitments:

- Approach from a place of learning
  - Broaden perspective through partnership
  - CBOs are experts in/knowledge of the experiences of underrepresented communities
- Intentional, Iterative, Non-Extractive
  - Use of a third-party facilitator
  - Build upon best practices & experiences from peer utilities
  - Development timing determined, in part, by needs of CBOs
- Accountability & Expectations

Community & Equity Advisory Group

Role of the CEAG & Relationship to the IRP

Will serve 3 primary functions

Discussion

- Participate in (facilitated) discussions regarding NW Natural's energy system planning, programs, investments, and other topics related to the operations of the Company

Perspective

- Provide advice, experience, and perspectives on social, economic, racial, tribal, and environmental equity, and assist in identifying best practices/ solutions for improving and expanding equity

Learning

- Understand (at a high level) the environment in which NW Natural operates, programs and other topics brought forward for discussion.

- Impetus for advisory group arose from previous IRP processes and conversations with stakeholders
- IRP will be one touch point for CEAG
- 2022 IRP timing will not align with timing for inaugural CEAG utilization
  - Opportunity for CEAG to evaluate 2022 IRP process and provide feedback for future

Community & Equity Advisory Group

Development Phase: Recruitment

- In formal recruitment process
- Outreach to 35+ organizations
- Scheduled meetings throughout December 2021
- Anticipate group to start meeting Q1 2022
- Initial commitments from numerous CBOs
- Open to further suggestions of organizations

Introduction to NW Natural's IRP

Who is NW Natural?

Quick Stats

- 163-year-old Oregon company
- Over 780,000 customers (meters)
  - 88% Oregon
  - 12% Washington
- Across 2 states, 18 counties, 140 different communities
- Serving over 2.5 million people
- More than 1200 employees

NW Natural's Core Values

"We Grew Up Here." We say that often because we've welcomed families and businesses to the Pacific Northwest since 1859. Our priority: helping them create warm, safe, productive places to live and work.

Service ethic

Safety

Environmental stewardship

Integrity

Caring

IRP Guidelines

Oregon : ORDER NO. 07-047 (link); ORDER NO. 08-339 (link)

Washington: WAC 480-90-238 (link)

IRP Guidelines outline the requirements of an IRP which govern the IRP process. There are 13 primary guidelines, but several have multiple sections and subsections. These guidelines are written for both Electric and Natural Gas Utilities, but not all guidelines apply to both.

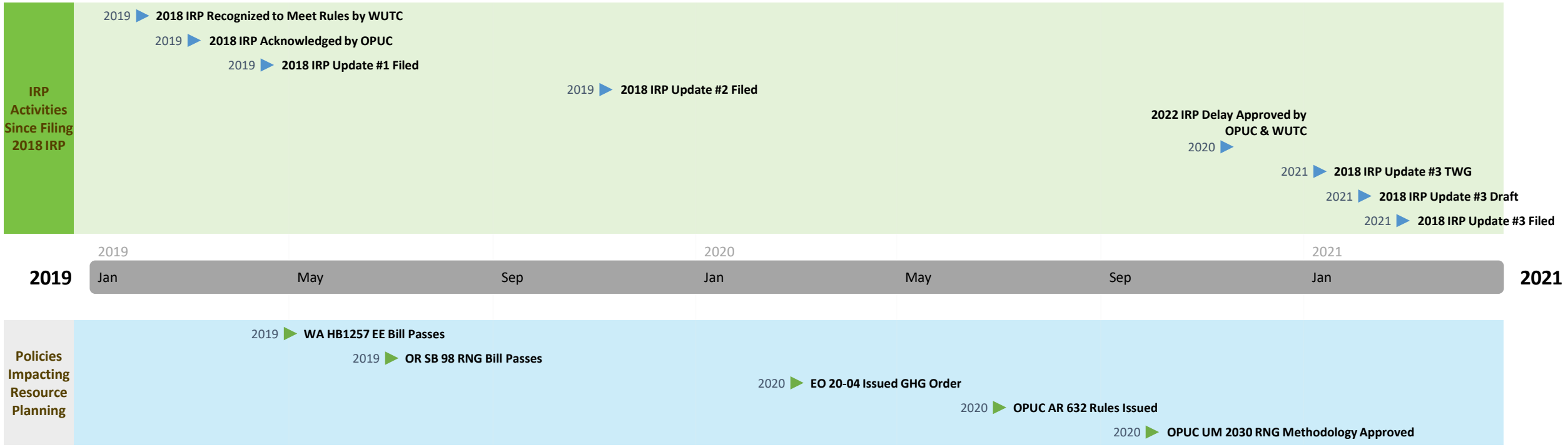
Guideline #1 (ORDER NO. 07-047)

(a) All resources (demand-side and supply-side) must be evaluated on a consistent and comparable basis

(b) Risk and uncertainty must be considered

(c) The primary goal must be the selection of a portfolio of resources with the best combination of expected costs and associated risks and uncertainties for the utility and its customers

IRP Activities Since Filing 2018 IRP



Update on Actions in 2018 IRP Action Plan

Action Description	Status
Recall Mist Storage Capacity for the 2020-21 and 2021-22 Gas Years	Updated load projections resulted in no Mist Recall being required for the 2020-21 gas year. Lower cost Citygate deliveries of 5,000Dth/Day are to be deployed for the 2021-22 gas year.
Use "all=in cost" RNG Evaluation Methodology to evaluate RNG resources	Item was not acknowledged but transitioned to an investigation. Docket no. UM 2030 was started in 2019 and completed October 2020. The RNG evaluation methodology was amended and approved and is now being used to evaluate RNG resources.
Complete Hood River Reinforcement Project	Construction started and the project was placed into service in September 2020 and included in rates.
Complete Happy Valley Reinforcement Project	Construction started and the project was placed into service in March 2020 and included in rates.
Complete Sandy Feeder Reinforcement Project	Construction started and the project was placed into service in October 2020 and included in rates.
Complete South Oregon City Reinforcement Project	Construction started and the project was placed into service in April 2020 and included in rates.
Complete Kuebler Road (Salem) Reinforcement Project	The project design is substantially complete and project team is in the process if securing required jurisdictional and environmental permits. Request for Proposal for construction services to be issued in early 2022 with project completion by October 31, 2022.
Acquire Energy Efficiency savings via Energy Trust for Oregon for 2019 and 2020	Energy Trust acquired 97% of the 2019 goal on behalf of NW Natural customers. Energy Trust acquired 114% of the 2020 goal on behalf of NW Natural customers. Final 2021 results are still pending.
Acquire Energy Efficiency savings via Energy Trust for Washington for 2019 and 2020	Energy Trust acquired 101% of the 2019 goal on behalf of NW Natural customers. Energy trust acquired 94% of the 2020 goal on behalf of NW Natural customers. Final 2021 results are still pending

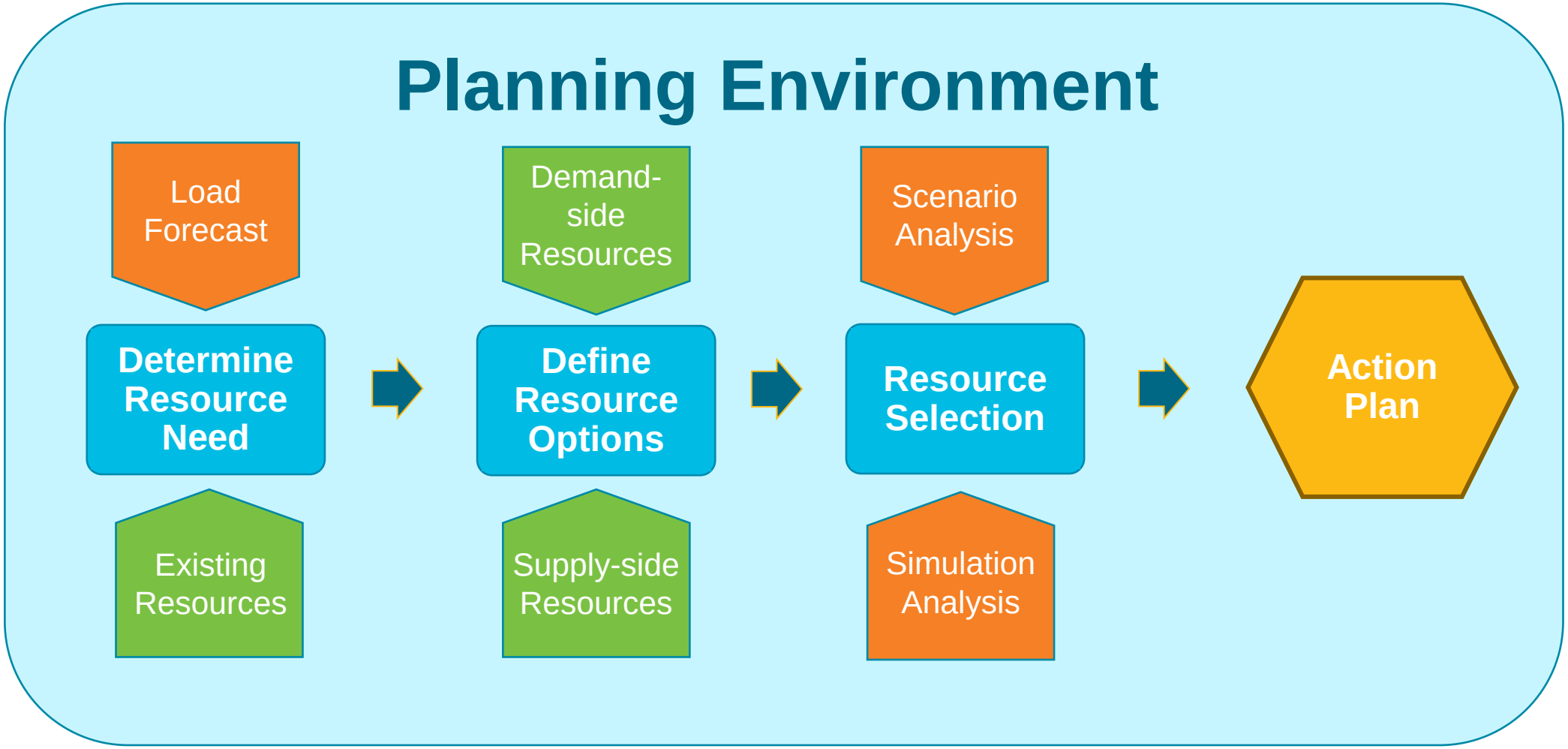
Update on Actions in 2018 IRP Update Action Plan

Action Description	Status
Complete North Coast Uprate Reinforcement Project	The project will begin in early 2022 for planning, design and assessing permit requirements. It is anticipated construction will be performed in multiple phases beginning in late 2022 or early 2023. Project planned for completion by October 31, 2023.
Complete Replacement of the Cold Box at NW Natural Newport LNG facility	This project is in the initiation phase and will schedule information will remain preliminary until an EPC contractor is selected and begins work. The preliminary schedule estimates design will continue through late 2023. Procurement would begin for long-lead items in mid-2023 with construction following in the second half of 2024. The project is anticipated to be complete and placed into service in Fall 2025.

A few things for the 2022 IRP

- Every new IRP we face new challenges and opportunities to incorporate into our planning
- We will comply with the IRP guidelines and use them to govern our IRP process
  - Resource selection through the IRP reflects the best resource portfolio within the planning environment and is an outcome of the process
  - The outcomes from the IRP can help inform policy decisions, but IRP process itself is policy agnostic
- For this 2022 IRP we are extending our planning horizon out to 2050 to align with policy discussions about emissions targets
  - This is beyond the 20-year planning horizon specified by the IRP guidelines

IRP Process – 101



Green = Resources Orange = Tools

Discussion this Afternoon will focus on the Planning Environment and Scenarios for Analysis

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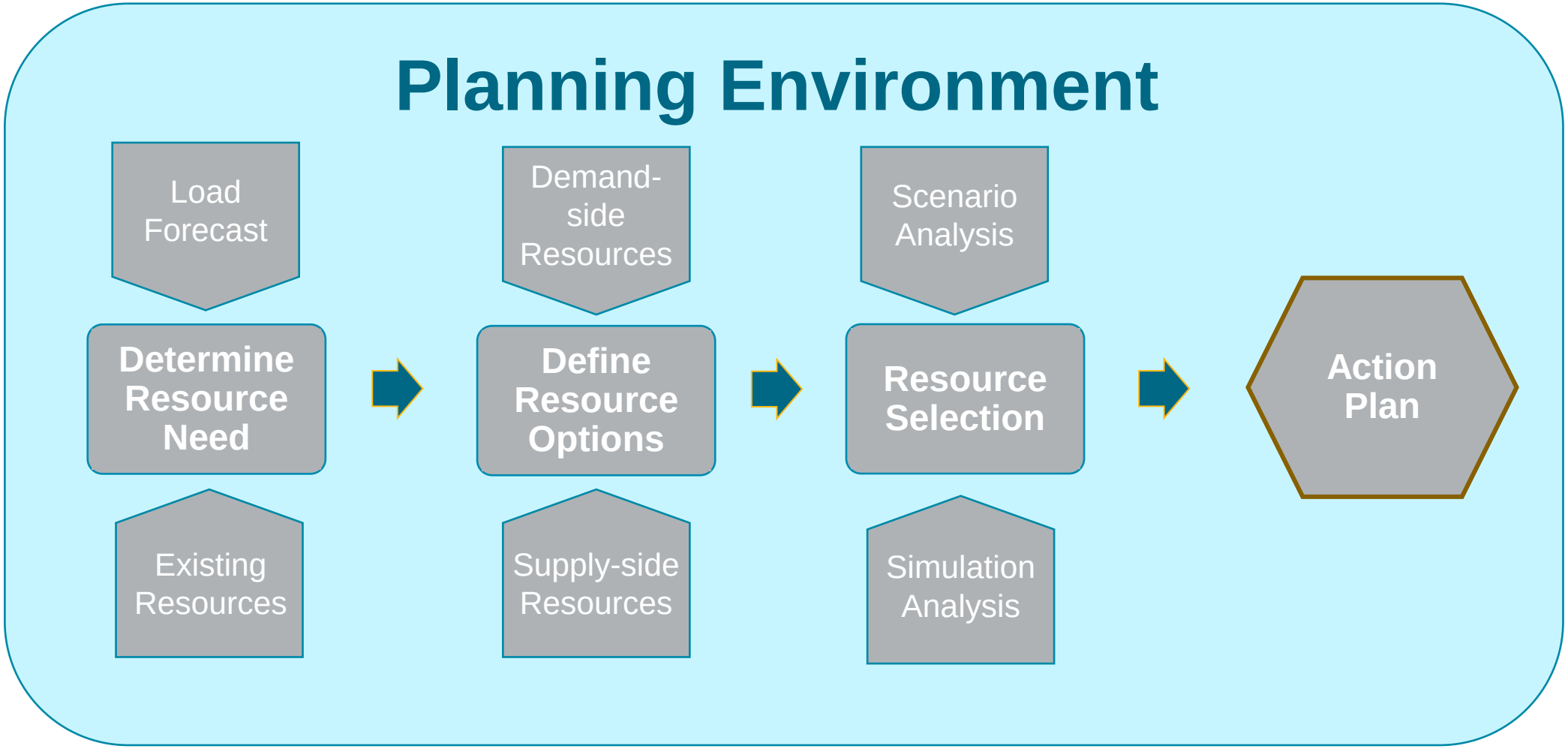

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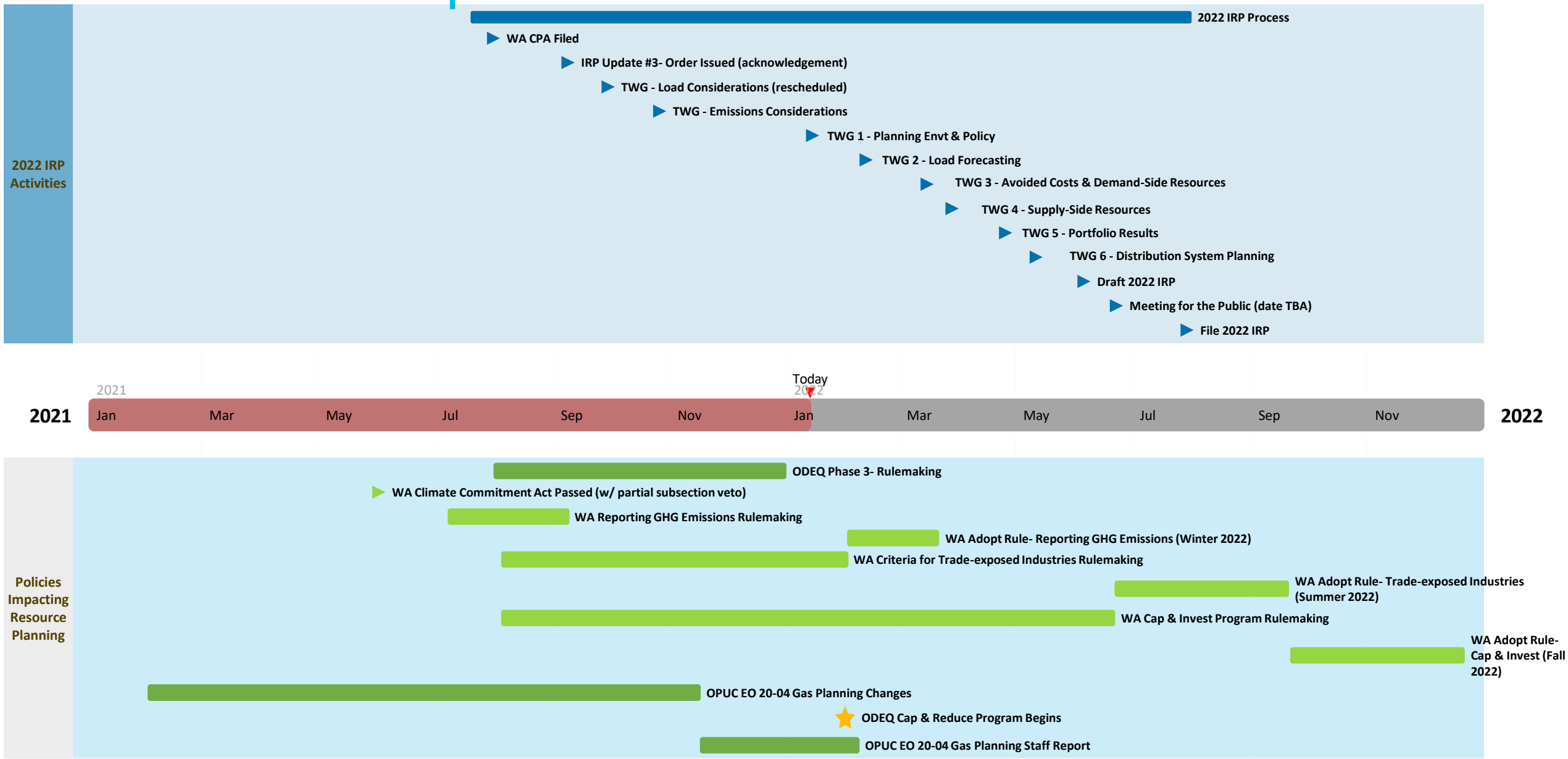
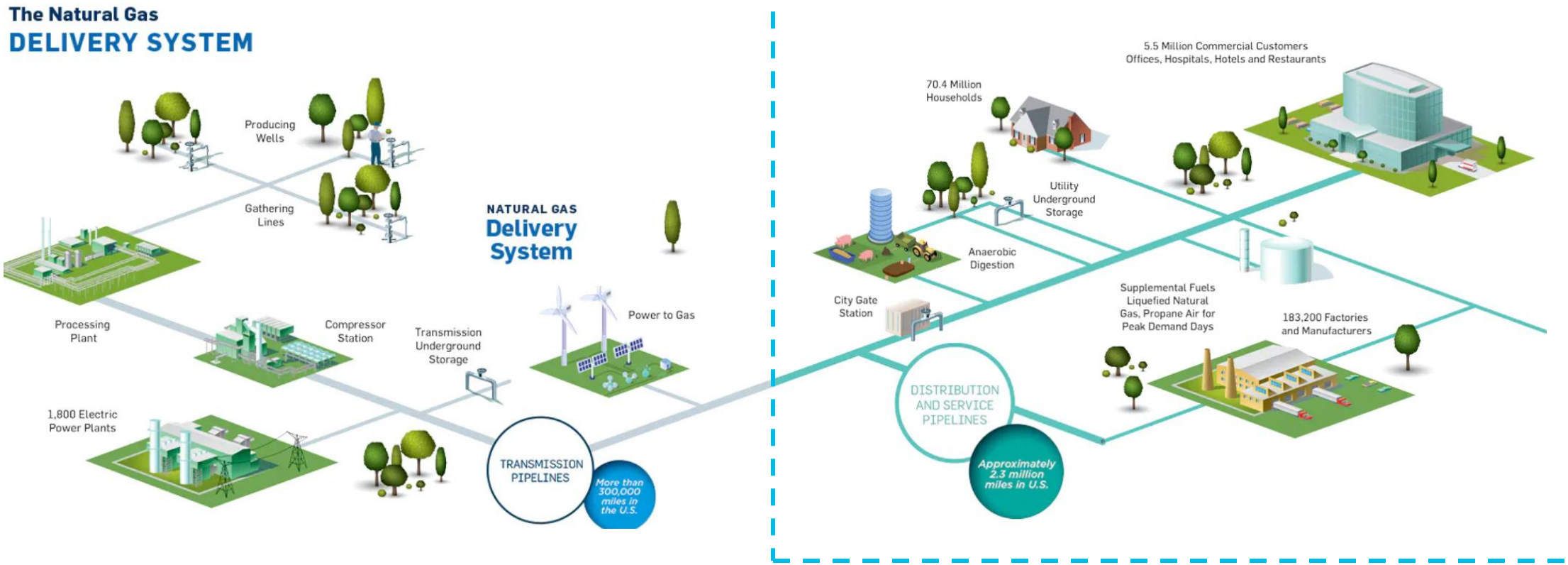
2022 IRP Anticipated Timeline

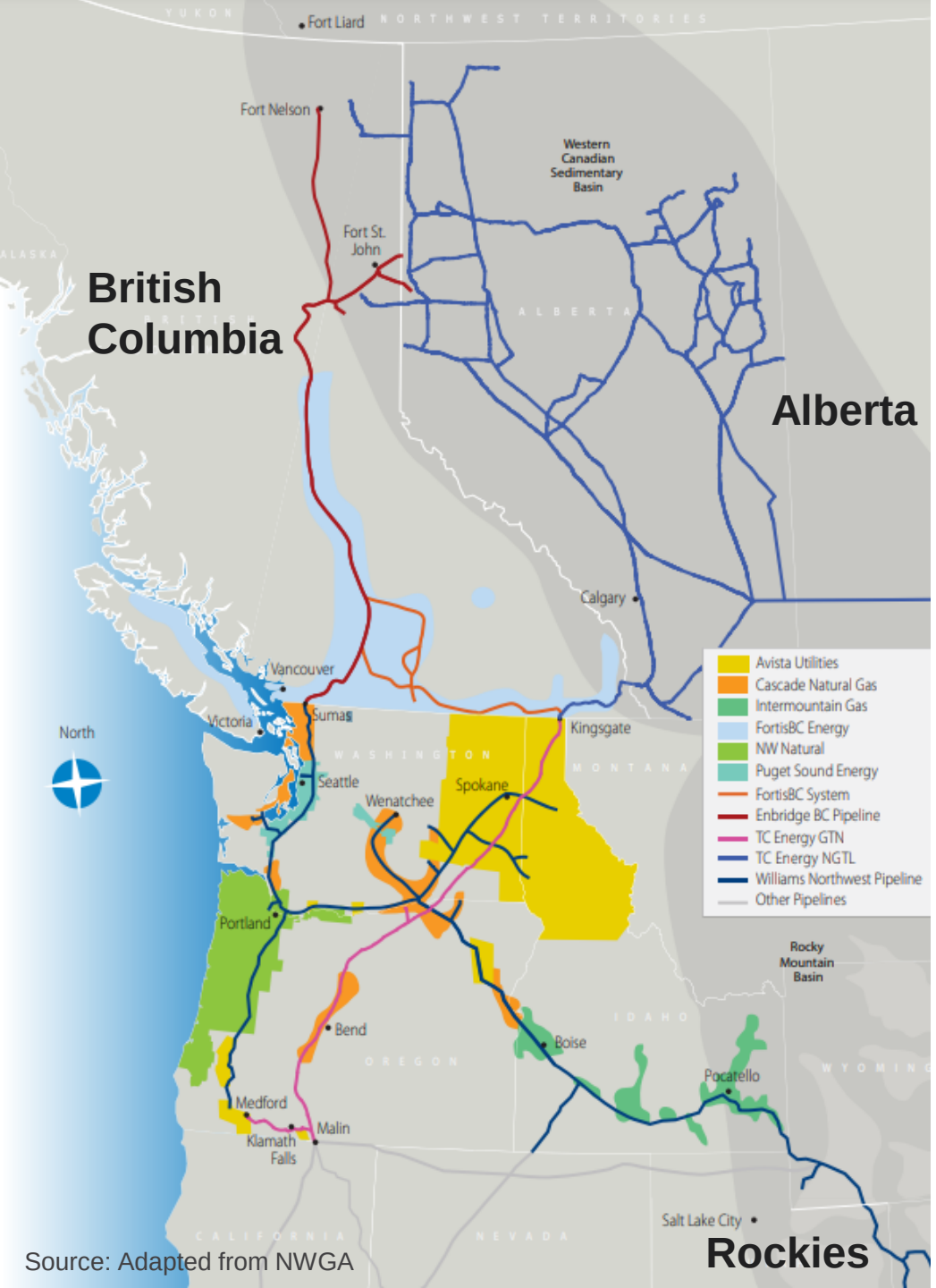


Supply Chain

Local Distribution Company (LDC)



Source: Adapted from American Gas Association



Source: Adapted from NWGA

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NW Natural Gas Purchases

All off-system gas purchases ultimately travel through Williams Northwest Pipeline to our service territory

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

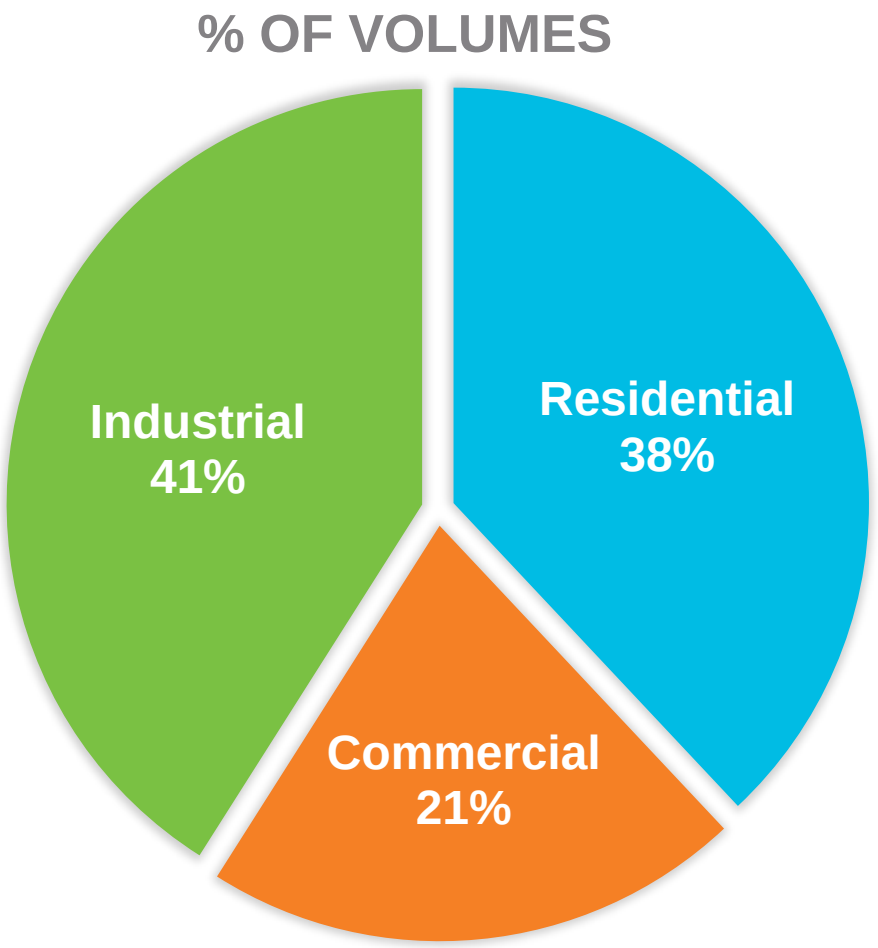
Currently NW Natural is procuring small amounts of RNG, and will be delivering increasing RNG volumes into the future

Types of Customers

Approx. Customer Counts (meters)

Residential	705,000	91%
Commercial	69,000	9%
Industrial	900	<1%

Source: NW Natural 2020 10-K



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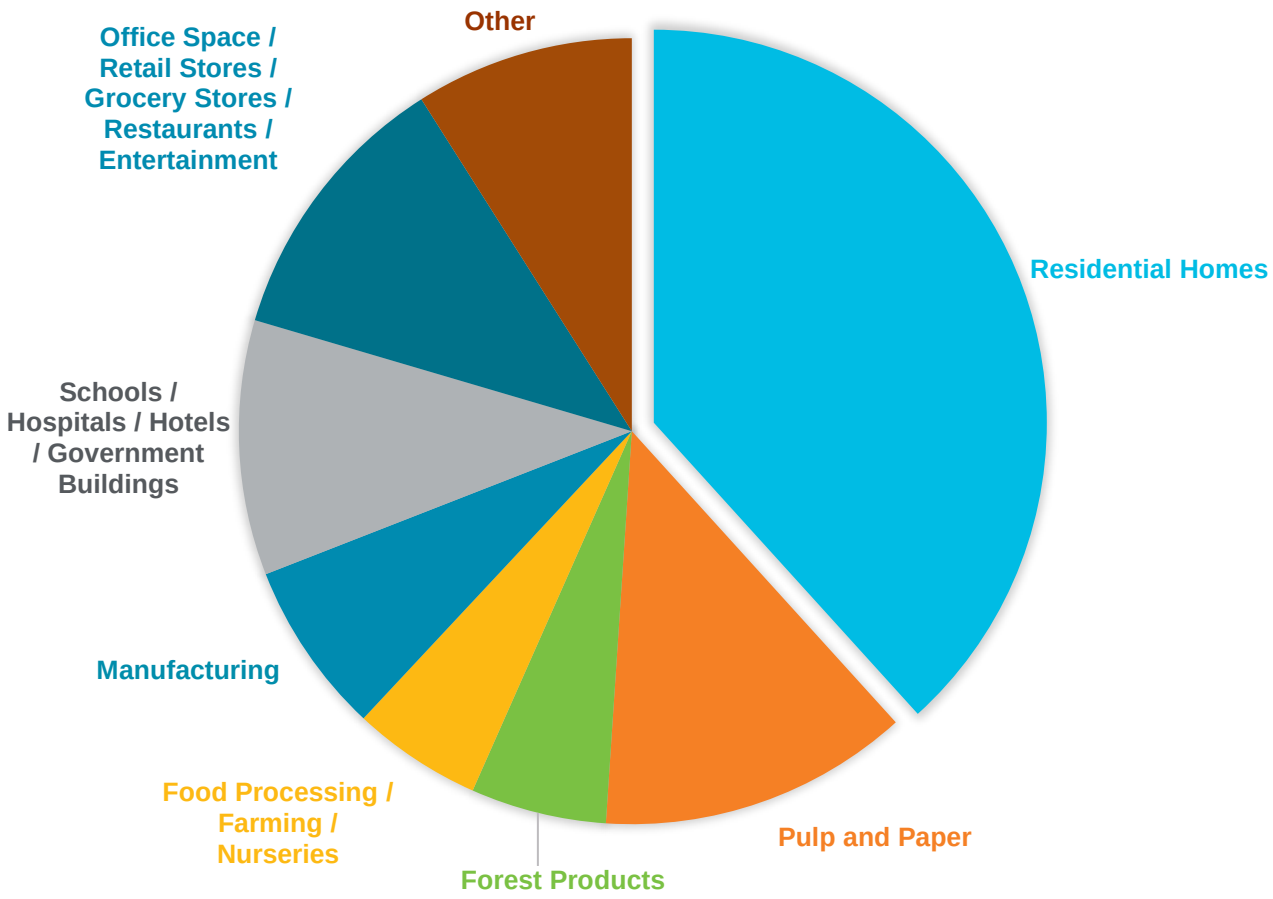
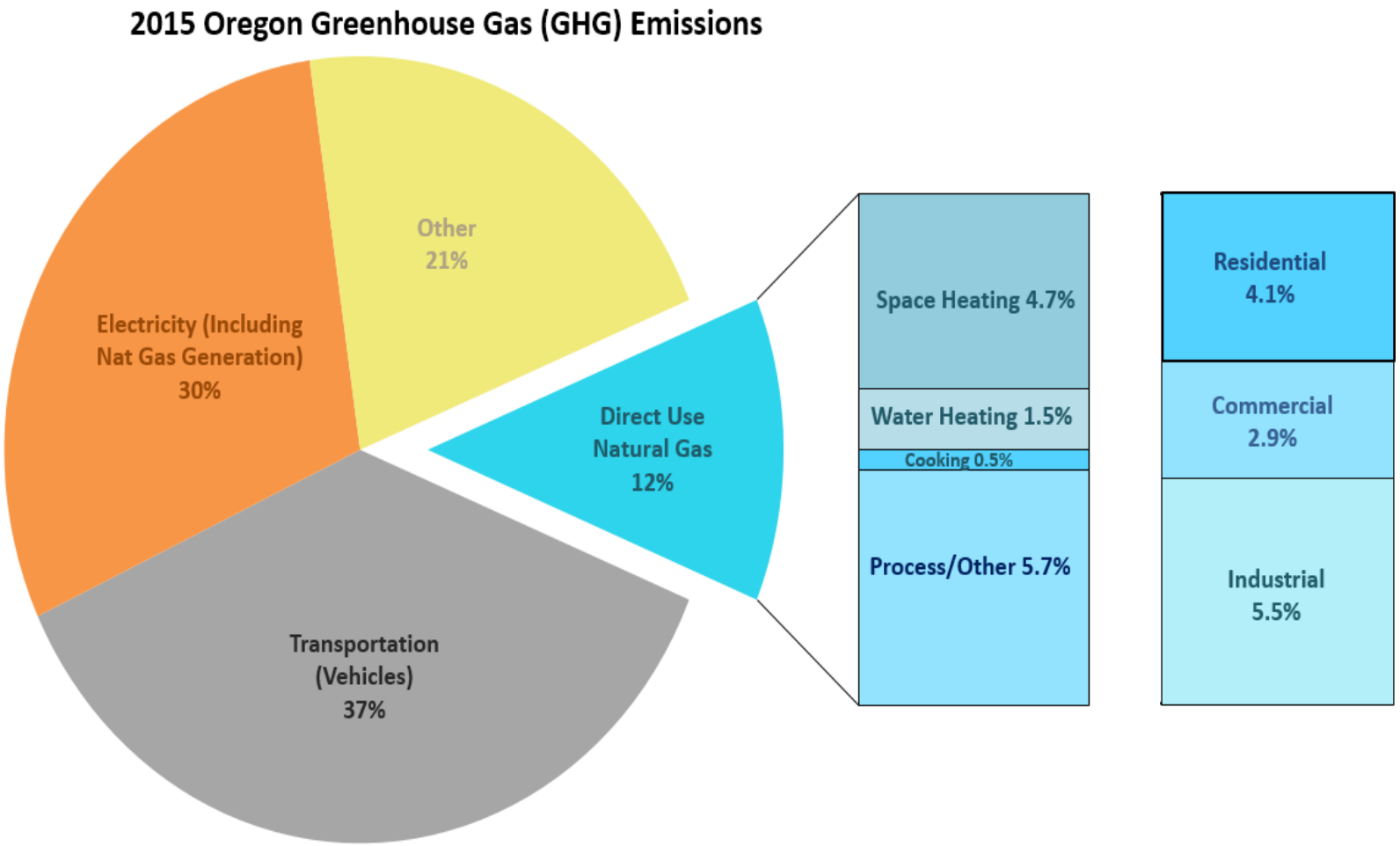
LOAD BY MARKET SEGMENT



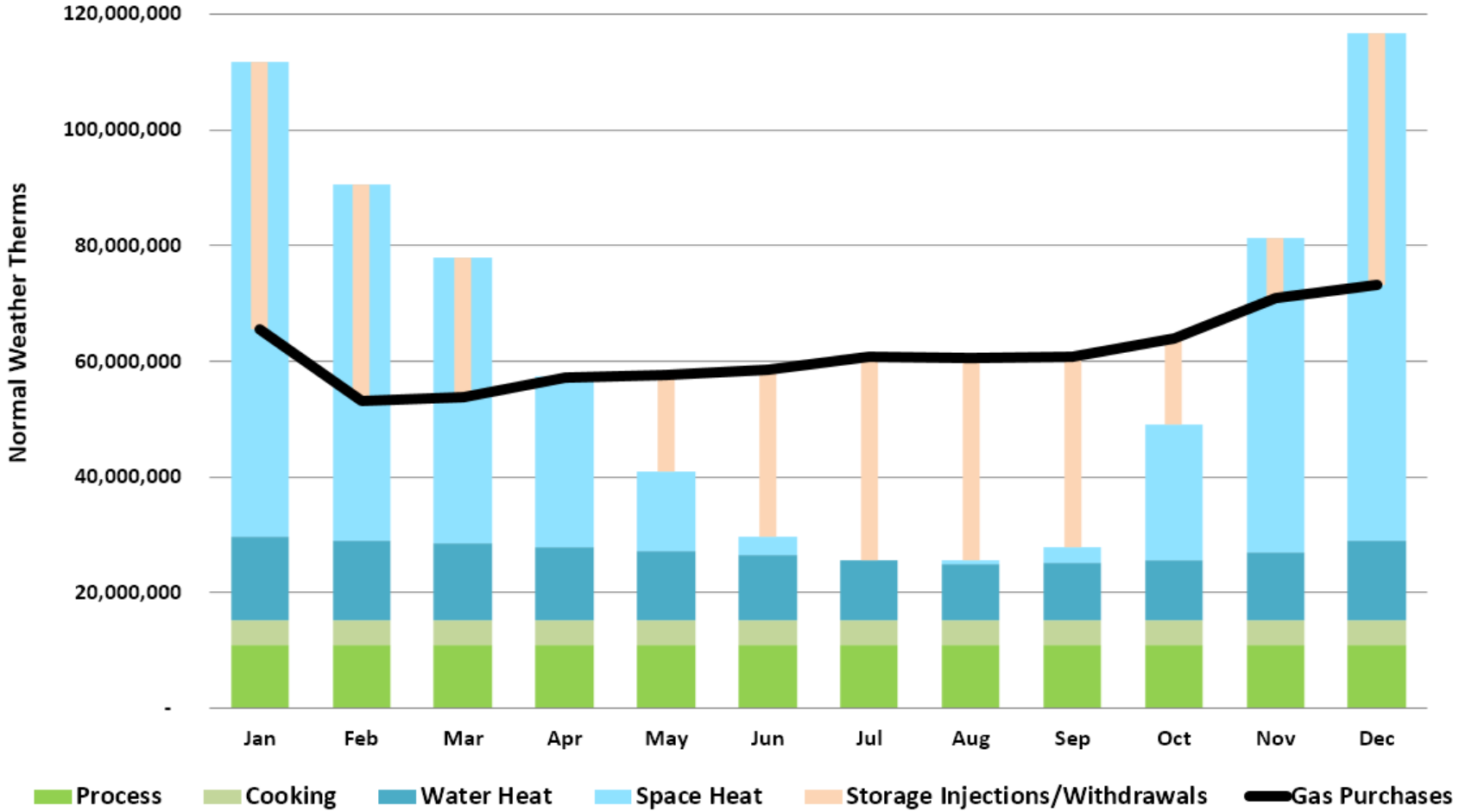
Emissions Context



Sources: (1) State of Oregon DEQ In-Boundary GHG Inventory Preliminary 2015 Figures- Residential, Commercial, and Industrial sector emissions are those that are not from electricity or natural gas use (2) Natural gas breakout: NW Natural analysis

- Roughly 70% of Oregon's space heating needs are served by direct-use natural gas
- Roughly 1/3 of direct use natural gas used in Oregon is on transportation schedules (this does not mean cars and trucks in this context)
- Roughly ½ of the natural gas associated with Oregon's energy use is used in electric generation
- Direct use gas' share of emissions have remained relatively constant over the last decade
- NW Natural represents roughly 80% of gas utility emissions covered by the CPP

Energy storage is critical to meeting seasonal demand



Source: NW Natural 2018 IRP, Figure 1.8: NW Natural Monthly Sales Load by End Use. Includes both firm and interruptible customers

Four Categories of Customers with different Rate Schedules

Services Offered by NW Natural

1) **Firm Sales**
   - All Residential, most Commercial, very small amount of Industrial
   - NW Natural purchases and delivers the gas
   - Firm customers receive priority for delivery of gas
2) **Interruptible Sales**
   - Large Commercial or Industrial
   - NW Natural purchases and delivers the gas, but the customer may be interrupted if necessary to deliver gas to firm customers
3) **Firm Transportation**
   - Large Commercial or Industrial
   - Customers under this tariff typically use a third-party gas marketer to acquire gas an bring it onto NW Natural's system
   - NW Natural provides the distribution services to *transport* the gas from the interstate pipeline to the customer's site location
   - Firm customers receive priority for delivery of gas on the distribution system
4) **Interruptible Transportation**
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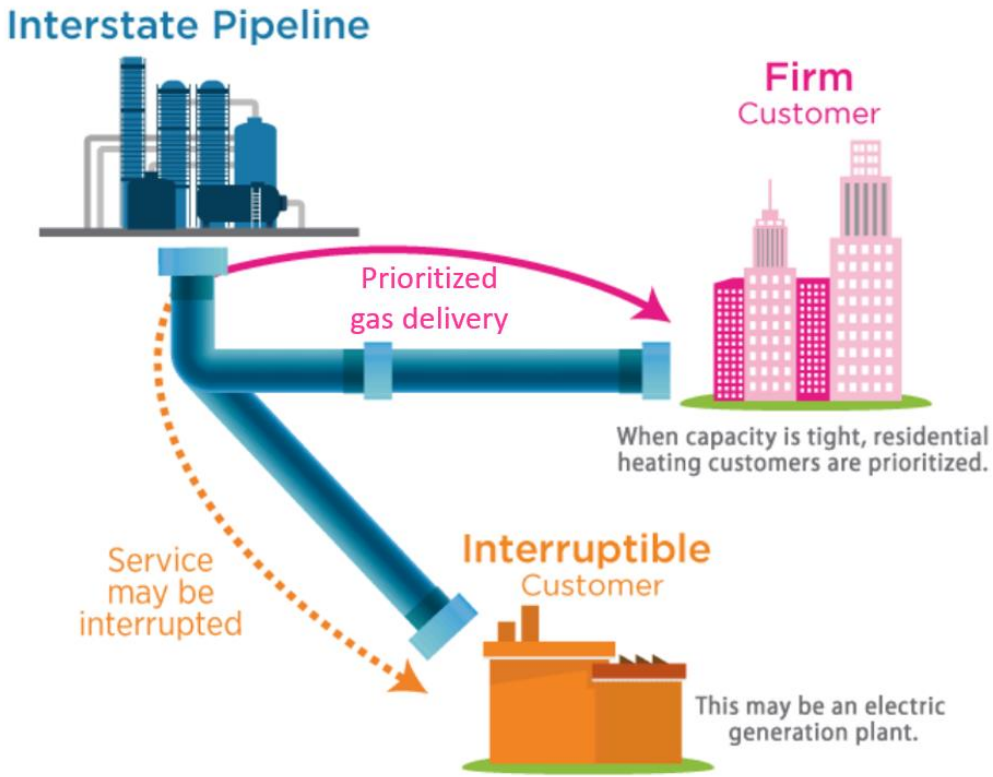
Firm vs. Interruptible



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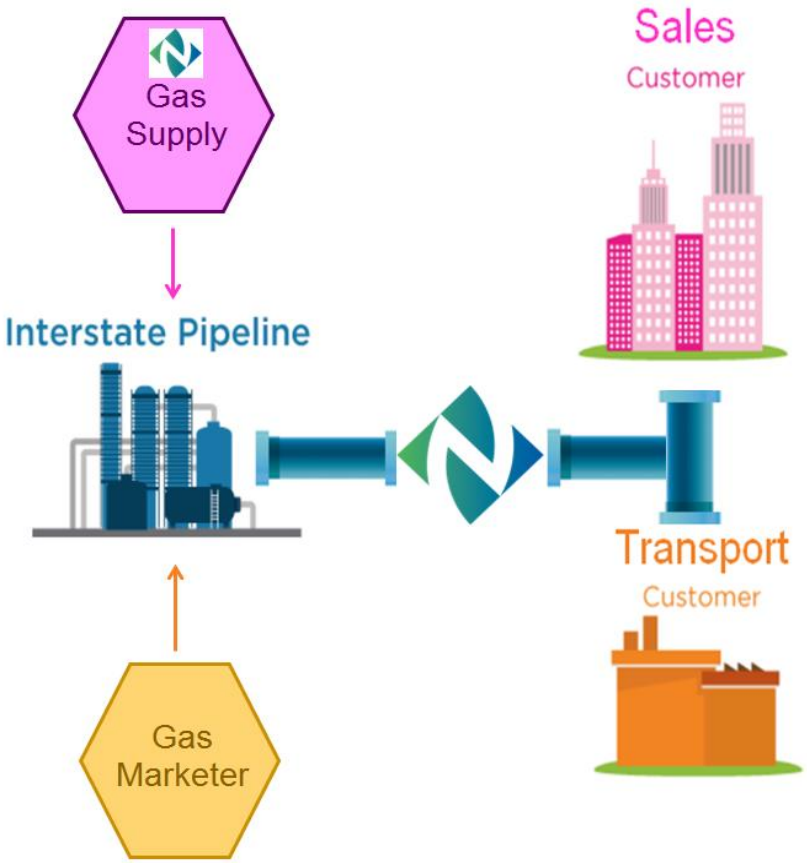
Sales vs. Transport



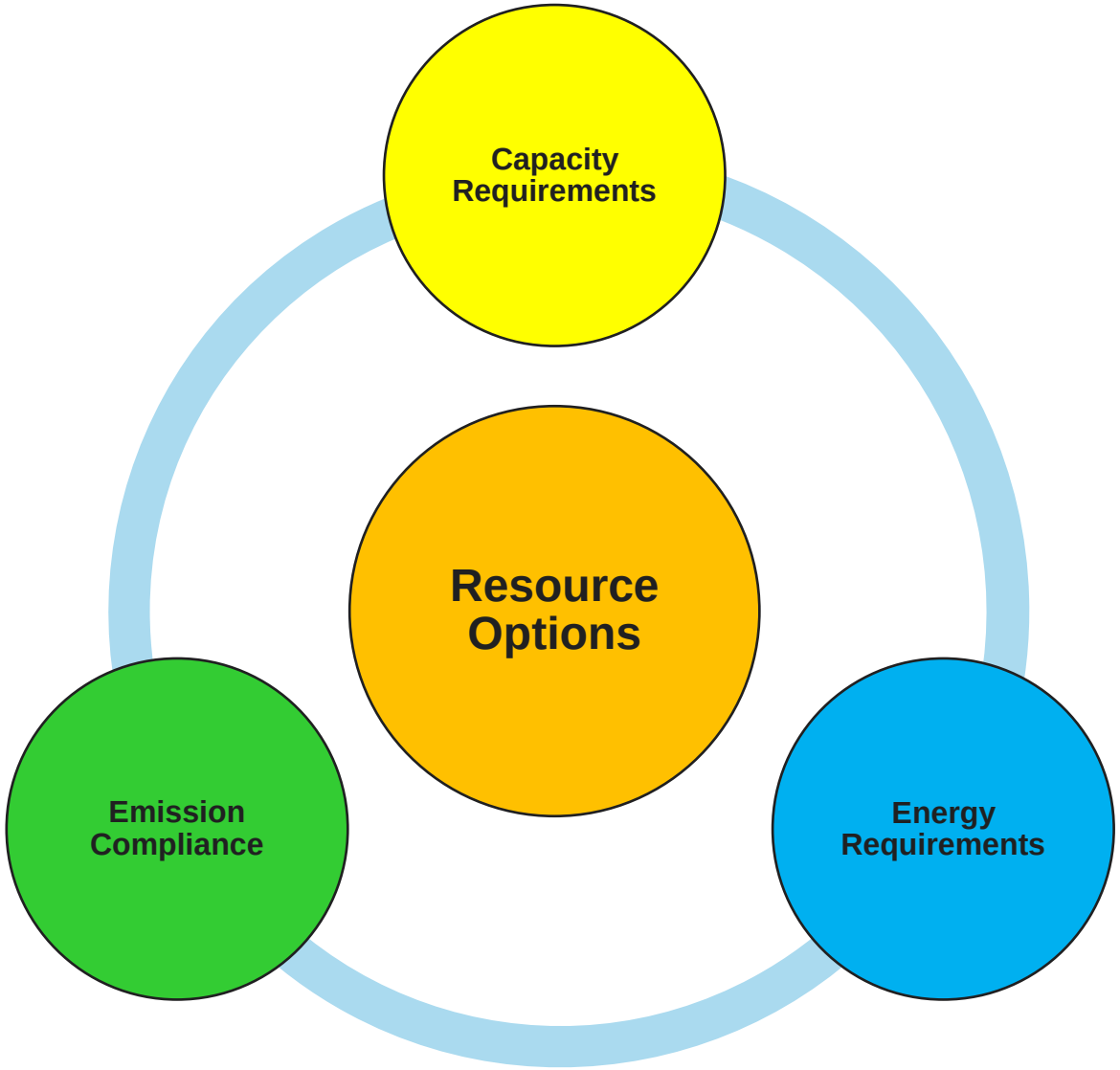
System Capacity Resources

Supply-side Options

Basin Gas Purchases
Off-System RNG
On-System RNG
Power-to-Gas
Underground Storage
LNG Storage
Pipeline Capacity

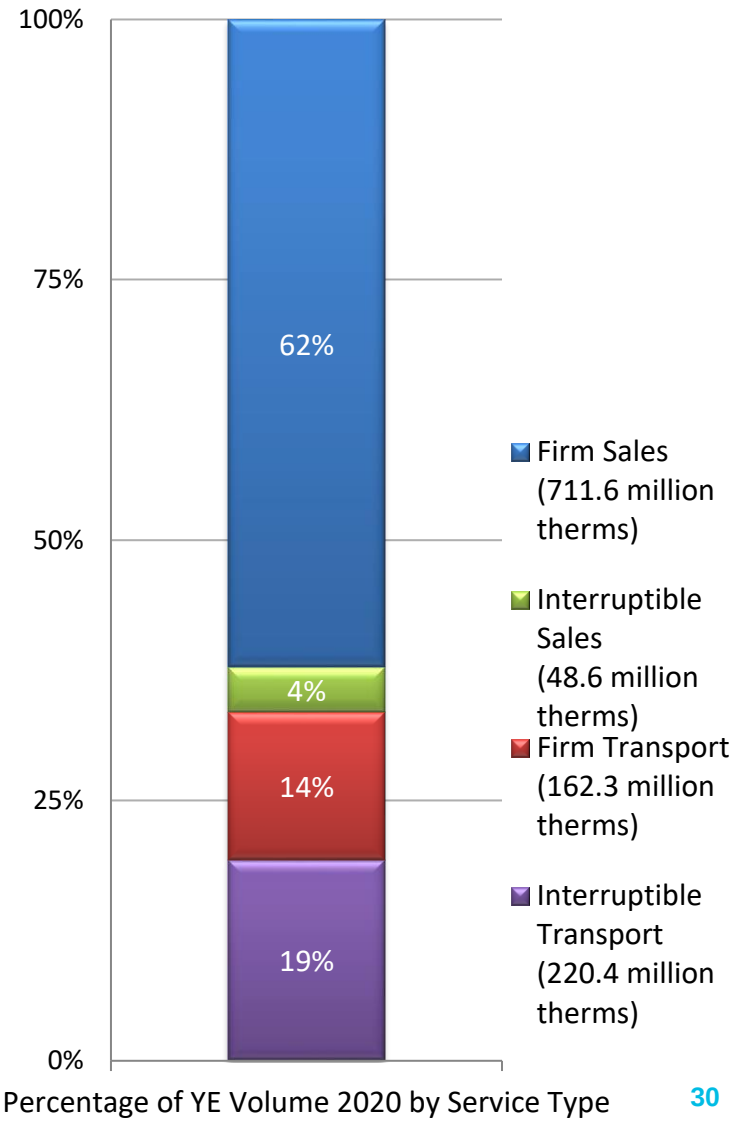
Demand-side Options

Energy Efficiency
Demand Response



Customer Types and Resource Planning

	System Capacity Resource Planning			Distribution System Planning
Customer Category	**Design Winter Weather Energy Requirements**	**Peak Day Capacity Requirements**	**Emission Compliance**	**Peak Hour Capacity Requirements**
Firm Sales	✓	✓	✓	✓
Interruptible Sales	✓		✓	
Firm Transport			✓	✓
Interruptible Transport			✓	



Percentage of YE Volume 2020 by Service Type

Distribution System Planning Options

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Distribution System Planning Alternatives (not all options are possible or applicable in all situations)				Option Currently Considered for Cost-Effectiveness Evaluation
Supply-Side Alternatives		Pipeline Related Capacity Options	Loop existing pipeline	✓
			Replace existing pipeline	✓
			Install pipeline from different source location into area	✓
			Uprate existing pipeline infrastructure	✓
			Add or upgrade regulator to serve area of weakness	✓
			Gate station upgrades	✓
			Add compression to increase capacity of existing pipelines	✓
	Non-Pipeline Solutions	Distributed Energy Resources (DER)	Mobile/fixed geographically targeted CNG storage	✓
			Mobile/fixed geographically targeted LNG storage	✓
			On-system gas supply (e.g. renewable natural gas, H2)	✓
			Geographically targeted underground storage	✓
Demand-Side Alternatives		Demand Response	Interruptible schedules (DR by rate design)	✓
			Geographically targeted interruptibility agreements	✓
			Geographically targeted demand response (GeoDR)	
		Energy Efficiency	Peak hour savings from normal statewide EE programs	✓
			Geographically targeted energy efficiency (GeoTEE)	

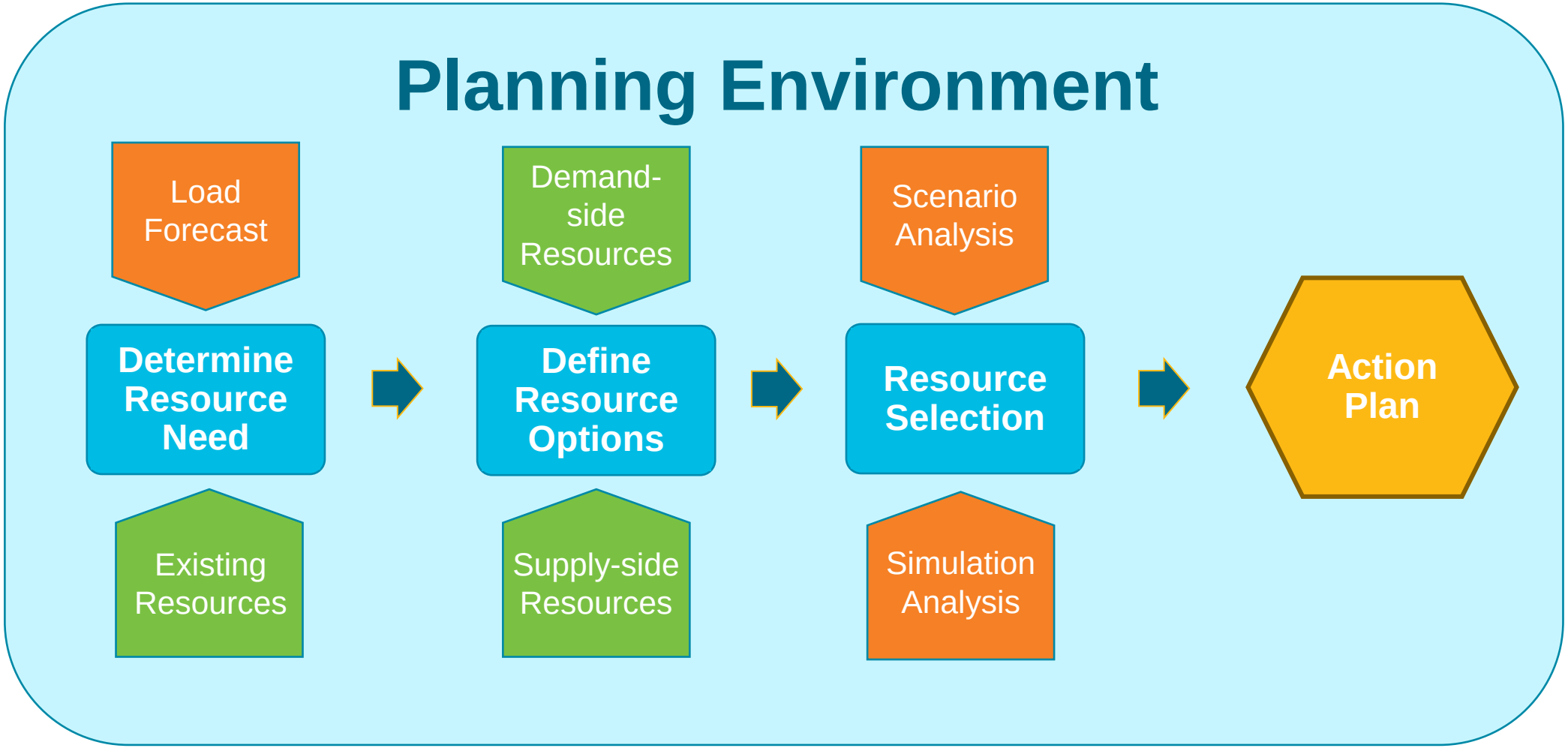
Least Cost and Least Risk Considerations for Resource Planning…

Not an exhaustive list

Break Slide

The Planning Environment and Scenario Development

IRP Process



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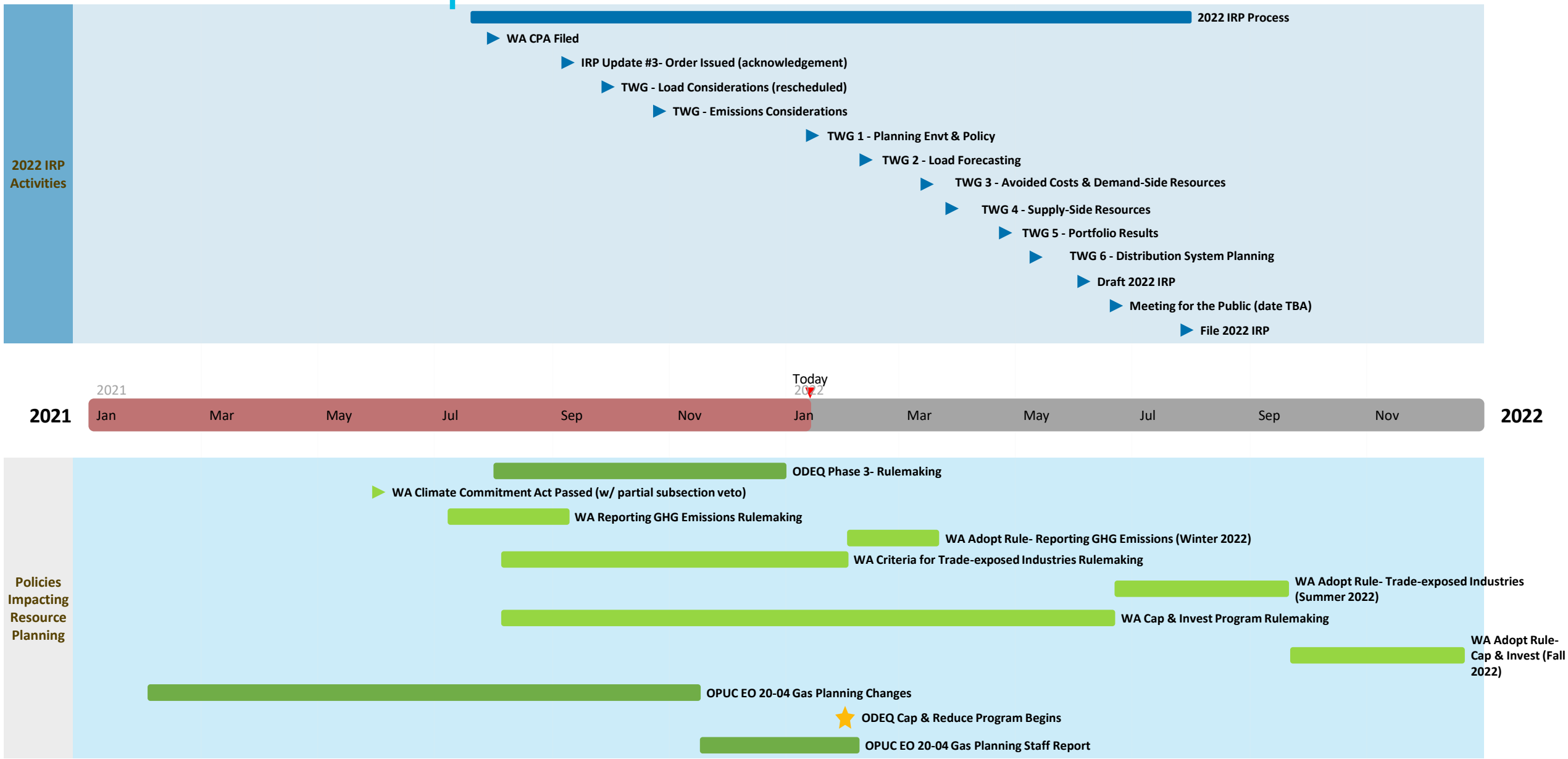
2022 IRP Anticipated Timeline



Emissions Forecast in 2018 IRP Update #3

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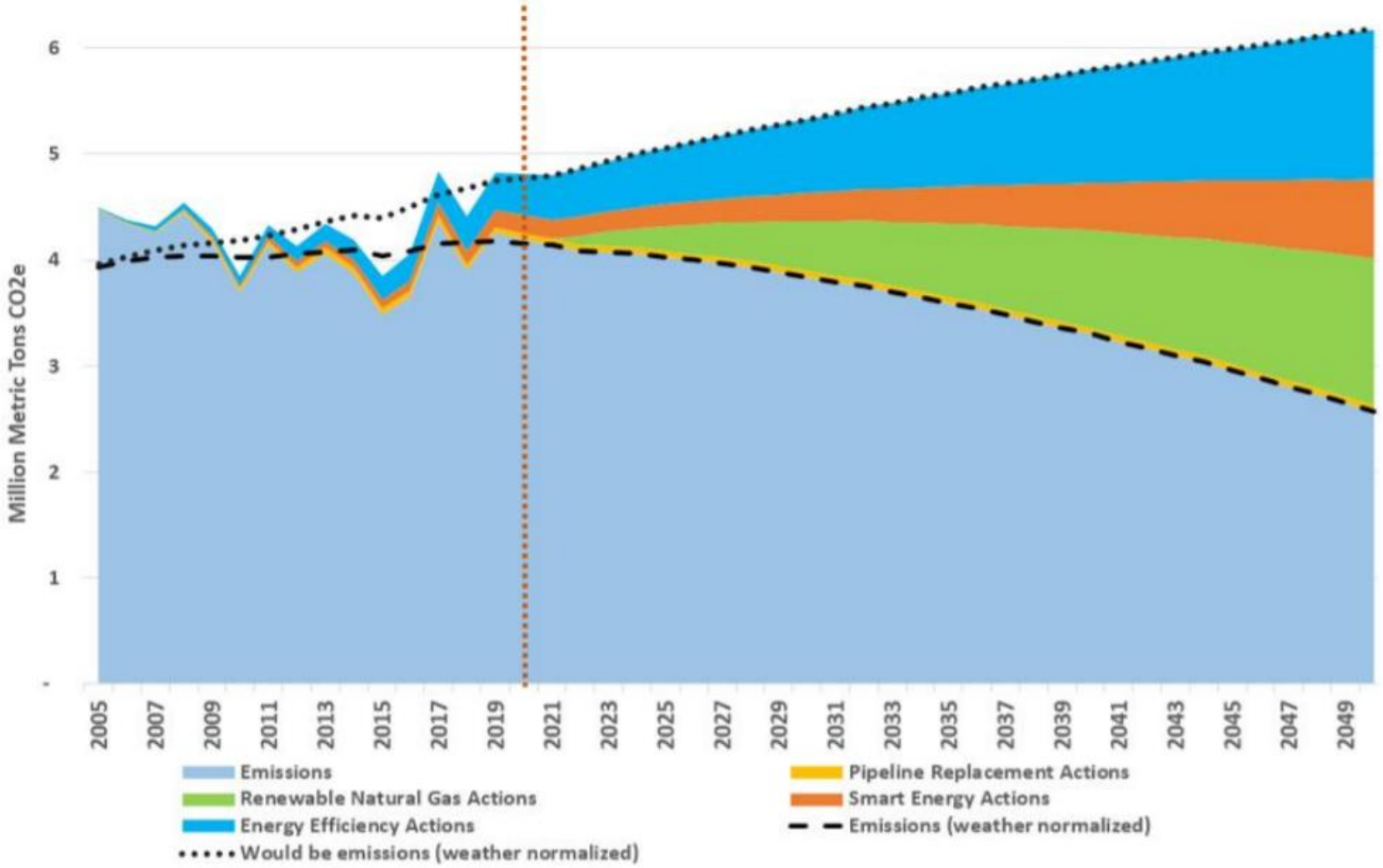
Figure 7: NW Natural Emissions Forecast Update



- **Shows Emissions from Sales Customers Only**
- **Includes NW Natural's Oregon and Washington Service Territory**

Changes in the Policy Landscape – Oregon

- SB 98 – Established voluntary portfolio standard targets for renewable natural gas (RNG)
- On March 10, 2020, Governor Kate Brown signed Executive order 20-04 which directed Oregon's Department of Environmental Quality (ODEQ) to take actions to reduce Oregon's GHG emissions and develop a cap and reduce program
- On December 16th ODEQ finalized the rules for the Climate Protection Program

Changes in the Policy Landscape – Washington

- The 2018 Amendments to the WA residential codes went into effect on February 1, 2021
- SB 5126 – Climate Commitment Act (Cap-and-Invest)
- HB 1257 – Clean Buildings bill
  - Voluntary renewable natural gas tariff
  - Conservation potential assessment (CPA) and two-year energy efficiency plan

Changes in the Policy Landscape – County and Local Governments

- Several local jurisdictions and local governments in the Pacific Northwest are developing climate action plans
- Some are considering placing a moratoria on new natural gas hook-ups
- At the same time, some jurisdictions are implementing an anti-moratoria of new natural gas hook-ups
- Local surcharges and carbon taxes are also being considered

Oregon and Washington Have Different Policies

- Planning our system across states lowers costs for all customers and continues to make sense
- Both states are implementing emissions cap systems, though they are quite different
- There will need to be more distinction between states in the 2022 IRP as NW Natural will have GHG emissions compliance obligations in different systems in each state
  - The options for compliance are not the same in the two states
- Oregon Climate Protection Program rules are finalized, Washington Climate Commitment Act rules under development

Resource Portfolio Selection Under Emissions Compliance

Modeling Challenges – State Boundaries?

- Oregon and Washington will have different emissions constraints
  - Where emissions are counted in the model will be important
  - How to calculate the carbon intensity of the gas flowing serving customers in each state
  - How are emissions credits (e.g., CCIs or off-system RTC purchases) incorporated into the cost minimization modeling
  - How are those credits allocated to each state
- In the past we have planned system resources jointly for OR and WA
  - There are significant benefits to both states by planning NW Natures system as a whole
  - Incorporating different emissions constraints presents an additional challenge

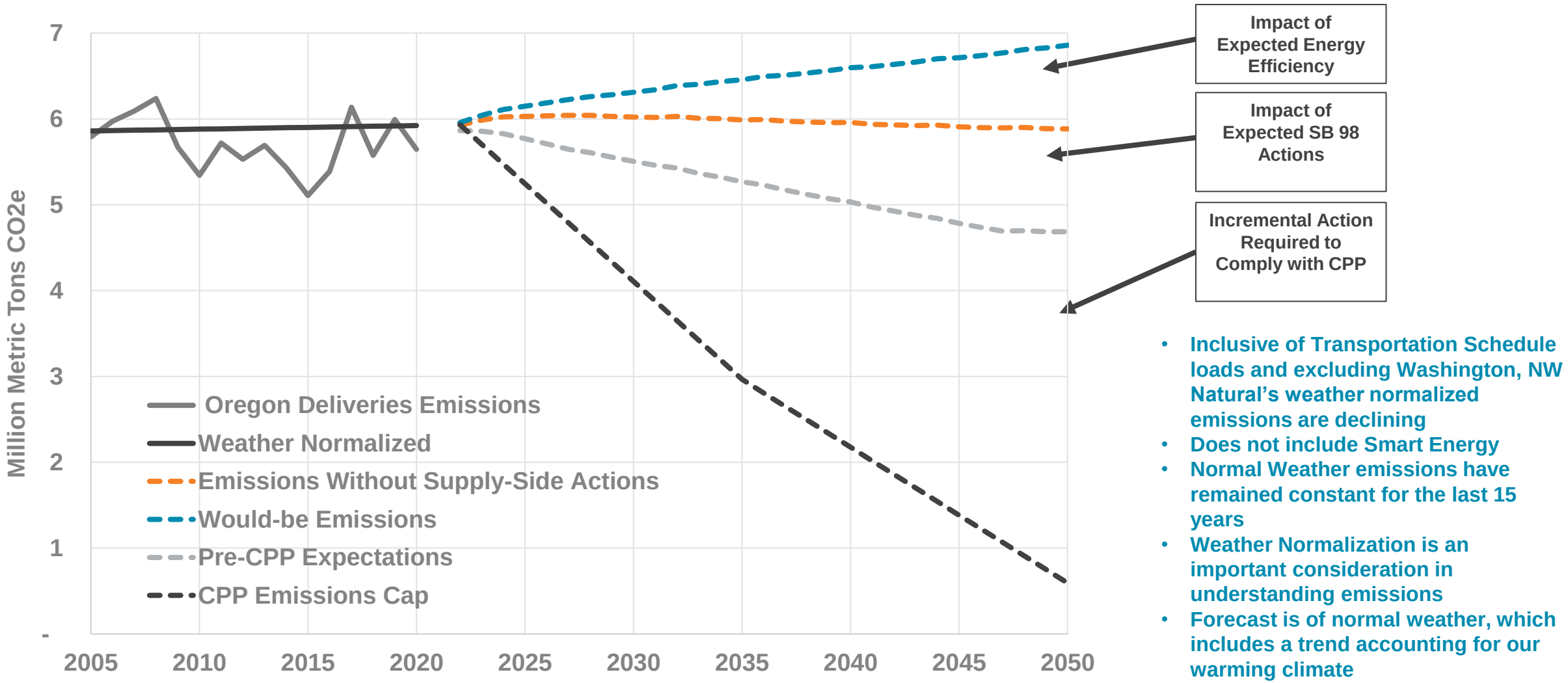
Oregon Climate Protection Program Overview

- Cap and reduce program administered by Department of Environmental Quality
- Covered entities include: fuels for transportation (e.g., cars and trucks), natural gas utilities, and large industrial emissions
- LDCs are responsible for emissions from all customers including transport customers with small exclusions
- Cap trajectory and emission reduction limits. LDC annual compliance instrument distribution is written into the rules:
  - 2022: 5,759,972 compliance instruments
  - 2035: 2,879,986 compliance instruments (50% reduction)
  - 2050: 575,997 compliance instruments (90% reduction)
- Banking and trading of compliance instruments is allowed, but there is no state sanctioned auctioning of compliance instruments
- RNG allowed and treated as binary
- Renewable hydrogen allowed
- Community Climate Investments rather than the offsets provisions of other jurisdictions

Community Climate Investment (CCI) Provisions

- Allowable usage of CCI Credits to demonstrate compliance is limited in the rule language:
  - Compliance period 1 (2022-2024): 10% of Emissions
  - Compliance period 2 (2025-2027): 15% of Emissions
  - All subsequent compliance periods(2028-2050): 20% of Emissions
- Price is fixed in the rule with a starting price of $107 per ton of CO2e
- Paying this price provides covered party with a credit for one metric ton of emissions to deduct from their compliance obligation
- Expire after two compliance periods (6 years)
- Availability not guaranteed

NW Natural's Oregon Compliance Outlook

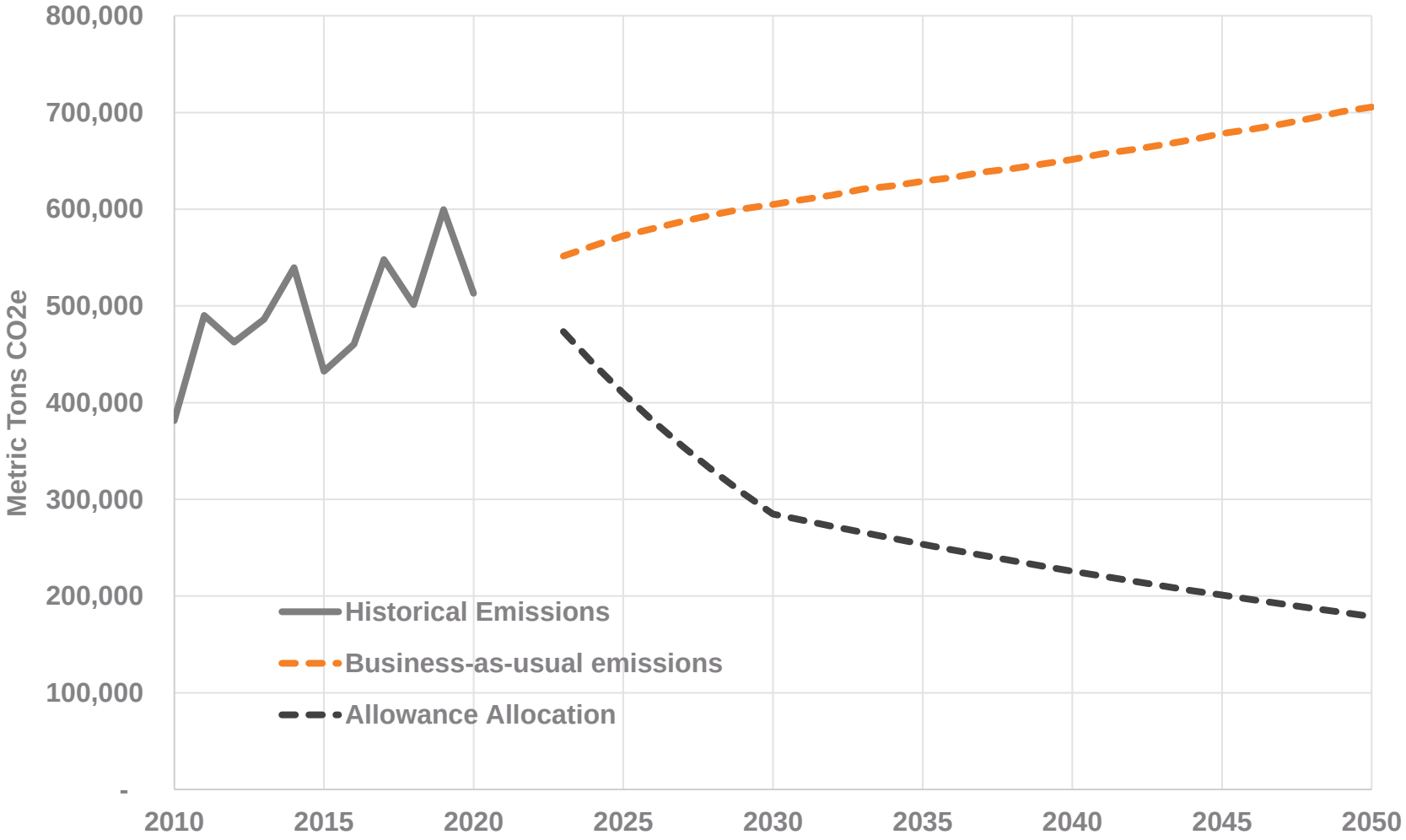


- Inclusive of Transportation Schedule loads and excluding Washington, NW Natural's weather normalized emissions are declining
- Does not include Smart Energy
- Normal Weather emissions have remained constant for the last 15 years
- Weather Normalization is an important consideration in understanding emissions
- Forecast is of normal weather, which includes a trend accounting for our warming climate

Washington Cap-and-Invest Program Overview

- Economy-wide cap-and-trade system currently in rulemaking
  - 45% below 1990 by 2030, 70% below 1990 by 2040, 95% below 1990 by 2050
- Draft rules are currently out for informal comment, final rules due Oct 1, 2022
- NW Natural 2022 IRP will be based upon draft rules (Expected filing July/August of 2022)
- LDC baseline for free allocation of allowances is average of 2015-2019
  - 93% of allocation baseline for 2023, reducing 7% per year until 2030, 2.3% thereafter
  - 65% of allowances consigned back to program in 2023, increasing by 5% per year until 100% of allowances are consigned
- Program sanctioned auction of emissions allowances
- Customers with greater than 25,000 metric tons of annual emissions have their own compliance obligation
- 5% offsets in first compliance period with 50% in state requirement, option for additional 3% on tribal lands
- Details about accounting of RNG unclear

NW Natural's Washington CCA Compliance Outlook



- Represents NW Natural's understanding of draft CCA rules as of 1/10/2022
- Inclusive of Transportation Schedule loads and excluding NW Natural's Oregon Service Territory
- Weather Normalization is an important consideration in understanding emissions
- Forecast is of normal weather, which includes a trend accounting for our warming climate

Emissions Reduction Options Differ in OR and WA Programs

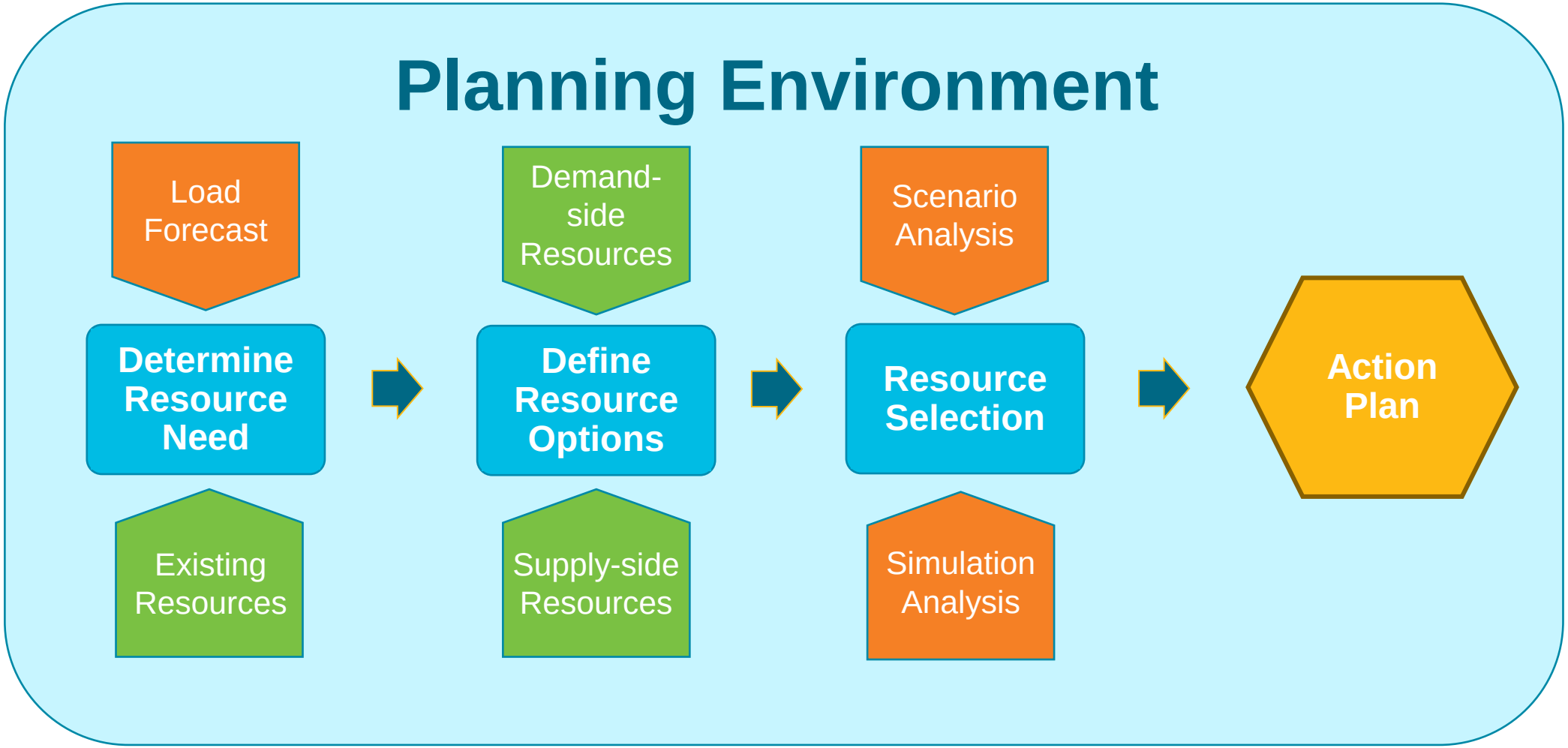
Resource Option	Long-term Compliance Option	Short-term Compliance Flexibility
Energy Efficiency	✓	
Development RNG	✓	
RNG offtake from existing project	✓	✓
Development Hydrogen	✓	
Development Synthetic Gas	✓	
Community Climate Investements**	✓	?
Banking	✓	✓
Allowance Trading at Auction*	✓	✓
Bilateral Allowance Trading**	✓	?
Offsets*	✓	?

* Only an option under Washington Cap-and-Invest

** Only an option under Oregon Climate Protection Program

- Given that emissions in a given year are uncertain due to factors outside of NW Natural's control, maintaining flexibility to adjust to changing conditions within a compliance period is required
- Program sponsored auctions of allowances, like is expected in Washington, provide this flexibility in many trading programs
- There is less flexibility in Oregon's Climate Protection Program (CPP)
  - The role of CCIs and bilateral trading as flexible short-term compliance options is uncertain
  - The only known flexible short-term CPP options are banking of excess early emissions reduction or purchasing RNG from existing projects

Scenario Definition Early in Process is Important to IRP Development



Green = Resources Orange = Tools

Risk Analysis:
Scenario vs Simulation Analysis

NW relies upon both scenario analysis and stochastic simulation analysis to assess risk

Both types or risk analysis are aimed at arriving at robust resource decisions that represent the best combination of cost and risk

Scenario Analysis

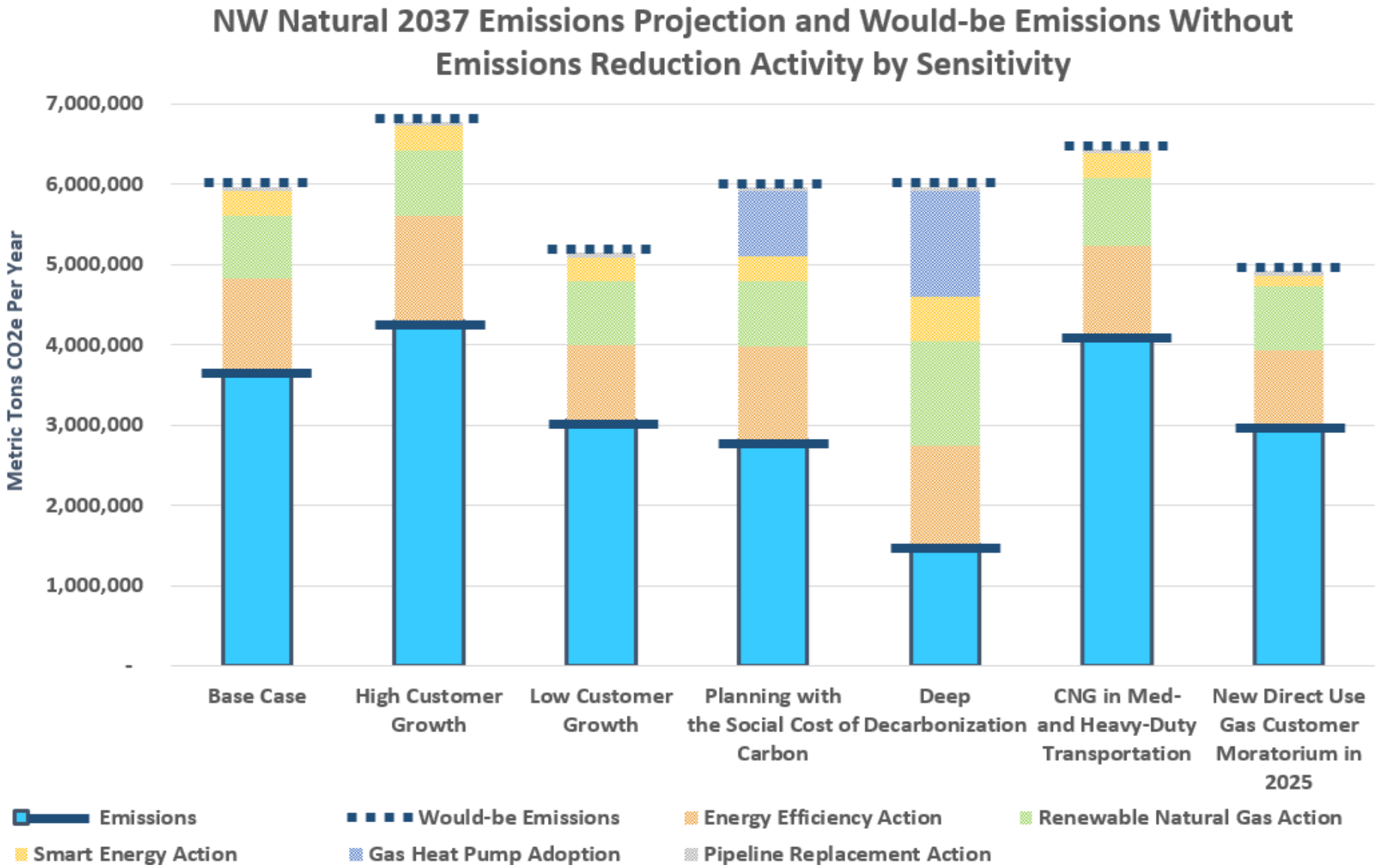
- Scenario development is important in determining modeling techniques and developing resource option inputs
- Helpful to understand key risks and how changes in key assumptions would impact resource decisions

Stochastic Simulation

- Defining stochastic inputs (e.g. range of gas prices and weather variation from year to year) will be developed later in the process

Scenario Analysis in 2018 IRP

NW Natural



Draft Scenarios for Evaluation in 2022 IRP

NW Natural®

		1	2	3	4	5	6	7	8
		Base Case - Compliance with OR-CPP and SB 98 and WA-CCA	**Carbon Neutral by 2050**	**New Direct Use Gas Customer Moratorium in 2025**	**Building Electrification**	**RNG and H2 Production Tax Credit**	**Limited RNG Availability**	**Supply-Focused Decarbonization**	**No CCIs Available**
Demand-Side	**Customer Growth**	Current Expectations		No New Customers After 2025		Current Expectations			
	Space and Water Heating Equipment	Moderate gas powered heat pump and hybrid heating adoption		High electrification of existing residential and small commercial load	Full electrification of existing residential and small commercial load by 2050	Moderate gas heat pump and hybrid heating adoption		No gas powered heat pumps and low levels of hybrid heating	Moderate gas heat pump and hybrid heating adoption
	Industrial Load Efficiency	Moderate increase	High increase	Moderate increase				Limited increase	Moderate increase
	Building Shell Improvement	Energy Trust projection	Energy Trust high sensitivity projection	Ajusted Energy Trust projection		Energy Trust projection			
Supply-Side	**Renewable Natural Gas**	Moderate availability and cost assumption	Moderately-high availability and moderate cost assumption	Moderate availability and cost		Moderate availability and low cost to customers	Low availability and moderately high cost	Moderate availability and cost assumption	Moderate availability and cost assumption
	Hydrogen	Moderate blending and dedicated system deployment; moderate cost assumption							
OR- Community Climate Investements		Costs and limits defined in CPP rule							No CCIs Available
WA- Allowances & Offsets		TBD- Pending Rule Development							

Draft Scenarios for Evaluation in 2022 IRP

NW Natural®

		1	2	3	4	5	6	7	8
		Base Case - Compliance with OR-CPP and SB 98 and WA-CCA	**Carbon Neutral by 2050**	**New Direct Use Gas Customer Moratorium (2025)**	**High Building Electrification**	**RNG and H2 Production Tax Credit**	**Limited RNG Availability**	**Supply-Focused Decarbonization**	**No CCI Scenario**
Demand-Side Assumptions	**Customer Growth**	Expected (Statistical Trend Continuation)		No New Customers After 2025		Expected (Statistical Trend Continuation)			
	Space Heating Equipment	Starting in 2025 30% of newly installed units are hybrid-heating and 30% are gas powered heat pumps	Starting in 2025 gas-powered heat pumps increase from 2% of newly installed units to 55% in 2050; Hybrid Systems ~10% installs	Half of existing gas equipment converts to another fuel at end of life starting in 2025	When a primary gas heating appliance is replaced the home or business is converted to an all-electric building	Starting in 2025 30% of newly installed units are hybrid-heating and 30% are gas powered heat pumps		Starting in 2025 10% of newly installed units are hybrid heating systems increasing to 30% by 2030	Starting in 2025 30% of newly installed units are hybrid-heating and 30% are gas powered heat pumps
	Water Heating Equipment	Starting 2025 30% of newly installed units are gas powered heat pump	Newly Installed Units ramp from 1% of installs in 2023 to 65% of installs in 2050			Starting 2025 30% of newly installed units are gas powered heat pump		Business-as-usual efficicnecy trend continues	Starting 2025 30% of newly installed units are gas powered heat pump
	Industrial Load Efficiency	Projection from initial resource potential study	30% Increase in industrial use efficiency	Projection from initial resource potential study				50% of projection from initial resource potential study	Projection from initial resource potential study
	Building Shell Improvement	Updated Energy Trust projection	13% incremental heating reduction from ETO projection	Energy Trust projection with adjustment for loss in savings from expectations		Updated Energy Trust projection			
Supply-Side	**Renewable Natural Gas**	125% of NWN-weighted share of national supply curve from ICF study	150% of NWN-weighted share of national supply curve from ICF study	125% of NWN-weighted share of national supply curve from ICF study		125% of NWN-weighted share of national supply curve from ICF study w/ 30% PTC benefit	NWN-Weighted share of low resource potential supply curve from ICF study	125% of NWN-weighted share of national supply curve from ICF study	125% of NWN-weighted share of national supply curve from ICF study
	Hydrogen	Blending up to 20% by volume and total deliveries up to 20% of energy deliveries; cost estimates from dedicated generation resources from Bloomberg; No limits to synthetic methane via methanation of hydrogen							
OR- Community Climate Investements		Costs and limits defined in rule							No CCIs Available
WA- Allowances & Offsets		TBD- Pending Rule Development							

NOTE: Newly installed units includes new construction and replacement upon burnout

Questions/Feedback

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We value your feedback today and are asking for feedback on proposed scenarios by February 4th, 2022