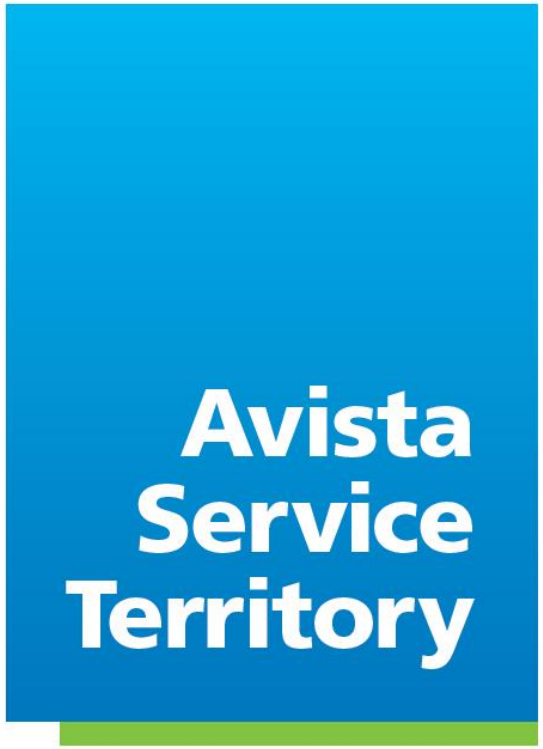
2023 Natural Gas Integrated Resource Plan

Oregon Public Utility Commission

June 29, 2023

Avistas System Map

Jurisdiction	# of Customers
ID	92,000
OR	105,000
WA	175,000
Total	**372,000**

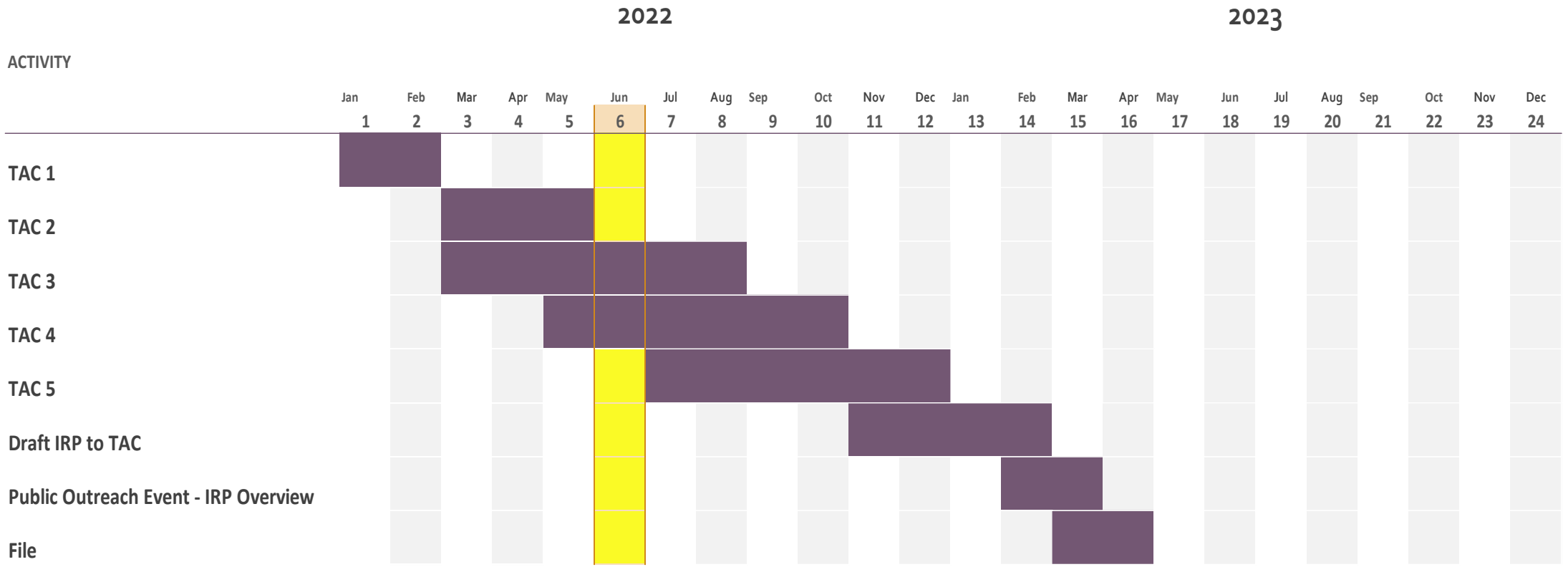


Electric
Natural Gas
Electric and Natural Gas

2023 – Avista Natural Gas IRP

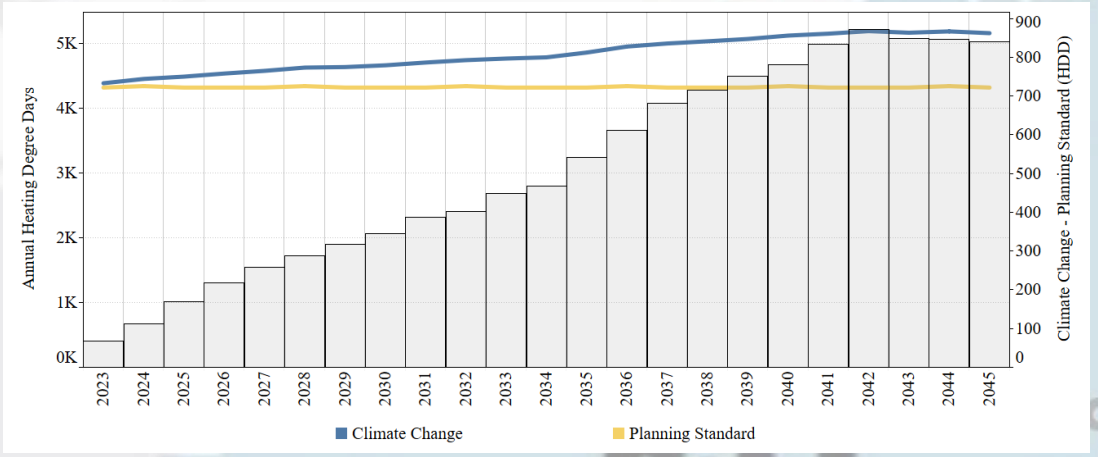
TAC process Highlights

- All model spreadsheets are available Avista's website
- 16 month process (2X prior IRP process)
- TAC meetings recorded and available on the Avista website

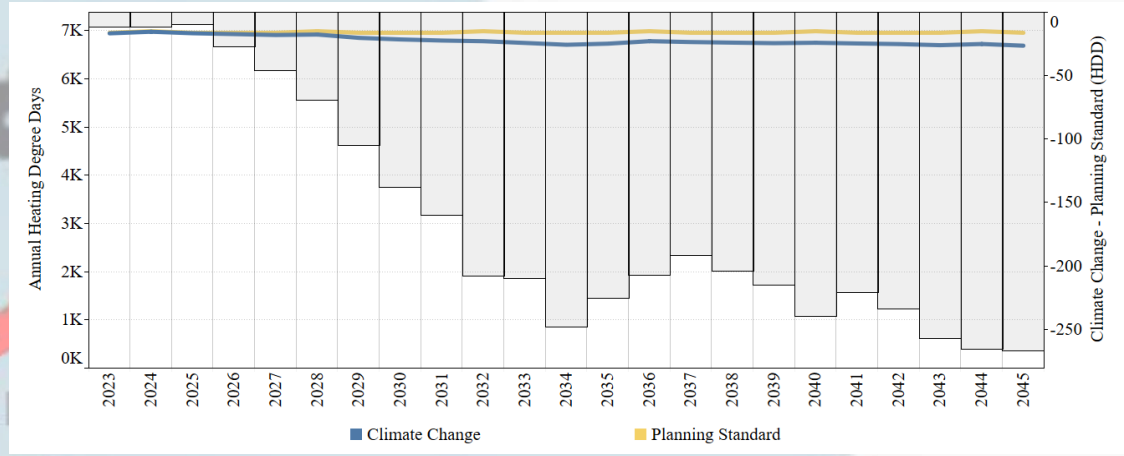


Weather Futures

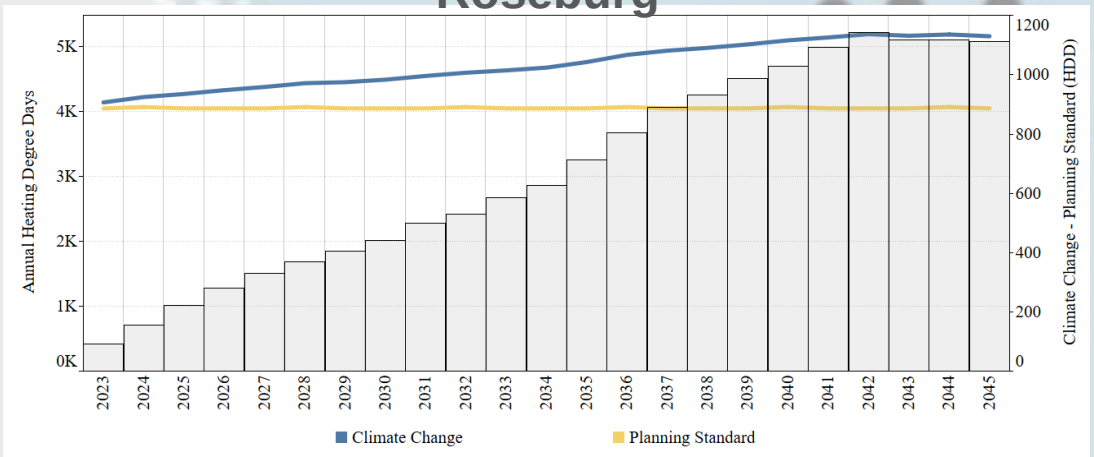
Medford



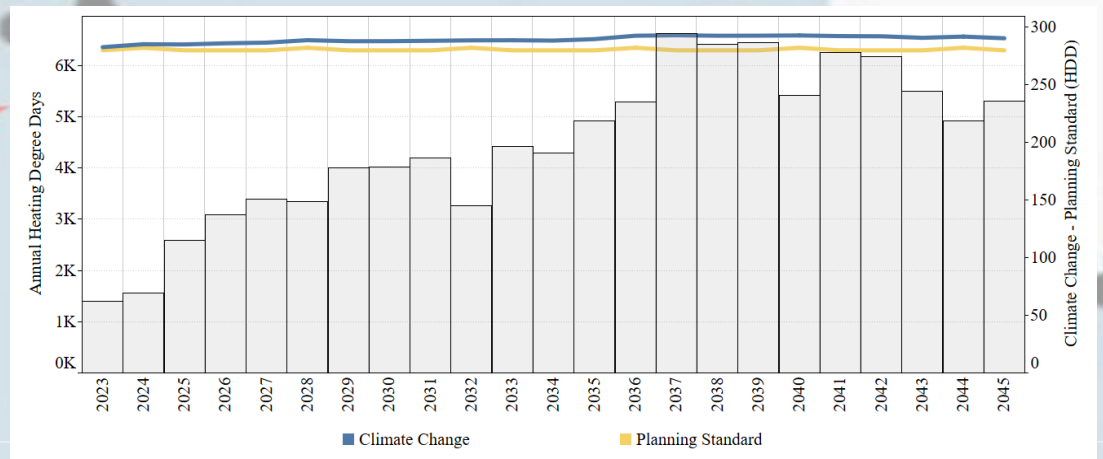
Klamath Falls



Roseburg



La Grande



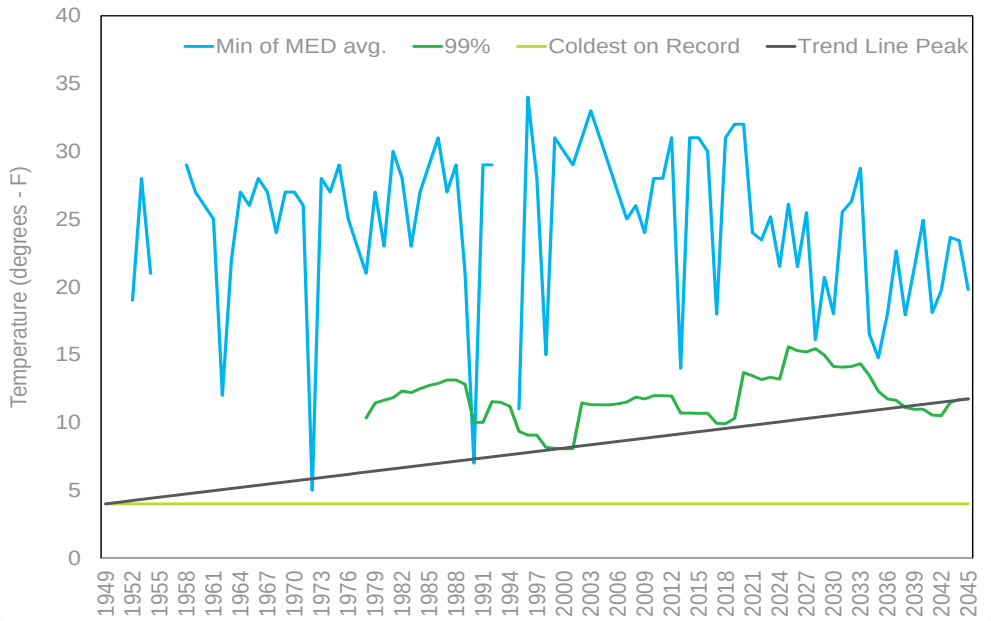
Weather Summary

- Average daily weather by planning region for the prior 20 years including climate change weather data.
  - Example:
    - 2022 data is from 2002 – 2021
    - 2030 data is from 2010 – 2029
  - Median of daily values for all climate study results by area
  - RCP 4.5 study values by area

- A peak event by planning region based on the past 30 years of the coldest average day, each year, combined with a 1% probability of a weather occurrence
  - Calculation now includes future projected peak values and is trended to the 2045 value from the historic coldest on record to smooth out volatility of peak day temperatures
  - Using the median values as peak day drastically reduces the temperatures for the design weather day
  - Taking the 95th percentage of climate models daily results and utilizing the highest annual value to include in the peak calculation reduces this risk of unserved customers

Planning Region	Coldest on Record	2021 IRP Peak	Trended Peak 2045
La Grande	-10	-11	-8.0
Klamath Falls	-7	-9	-5.1
Medford/Roseburg	4	11	11.7
Spokane, ID/WA	-17	-12	-14.6

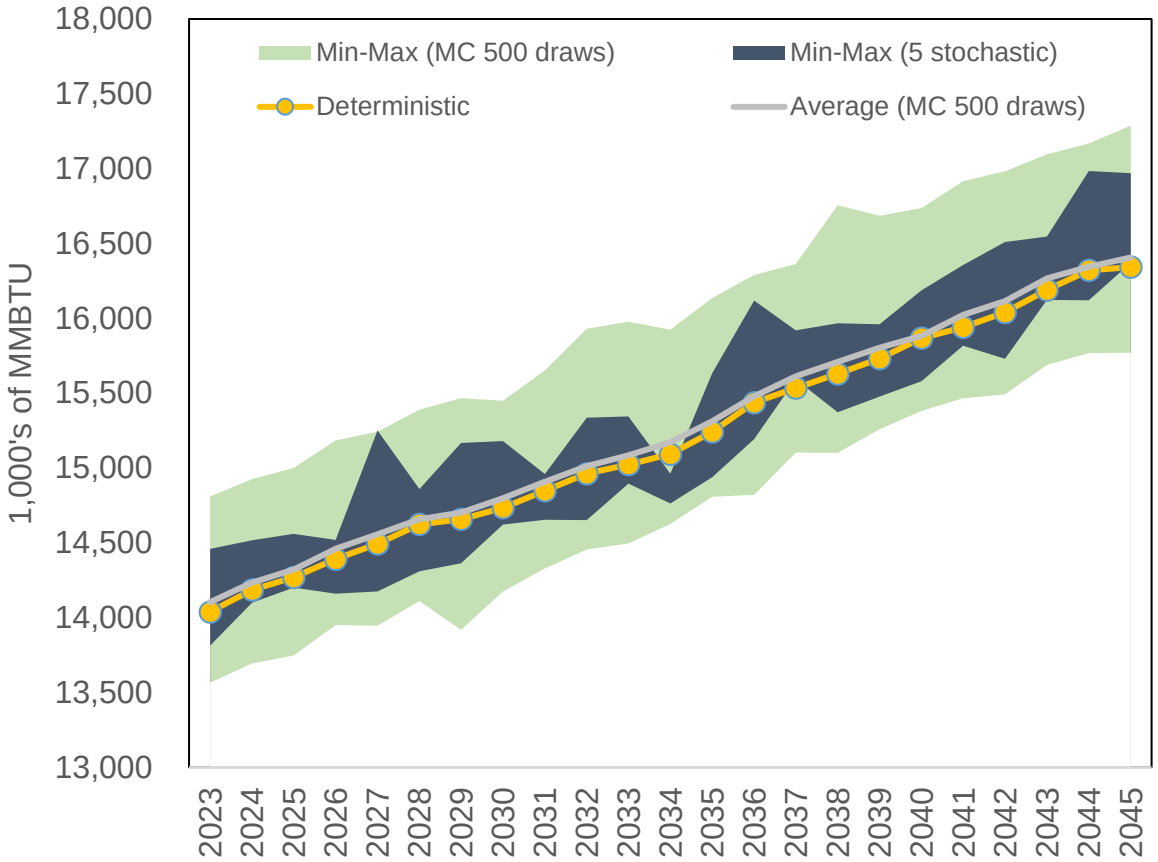
Medford Example



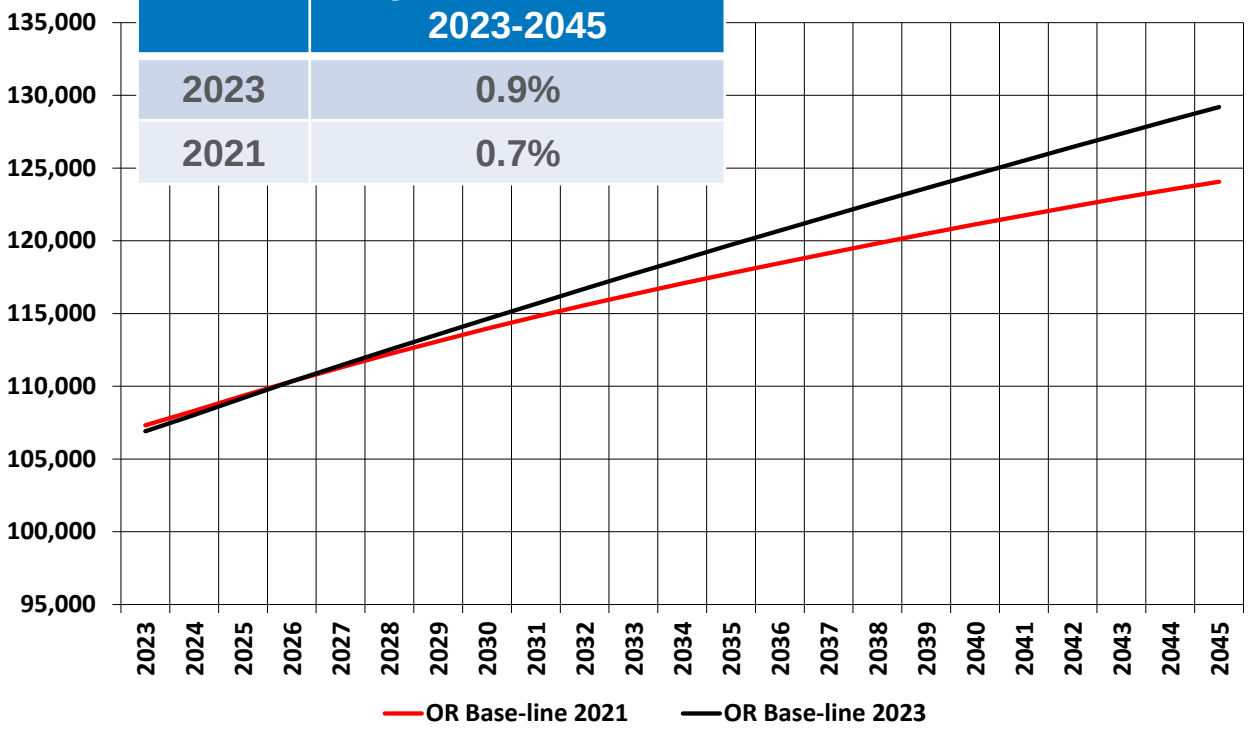
Load Forecast*

Highlights

- Deterministic used for capacity planning
- Stochastics used as a resource future reference to account for load variability
- 500 Monte Carlo 20 year futures used for risk

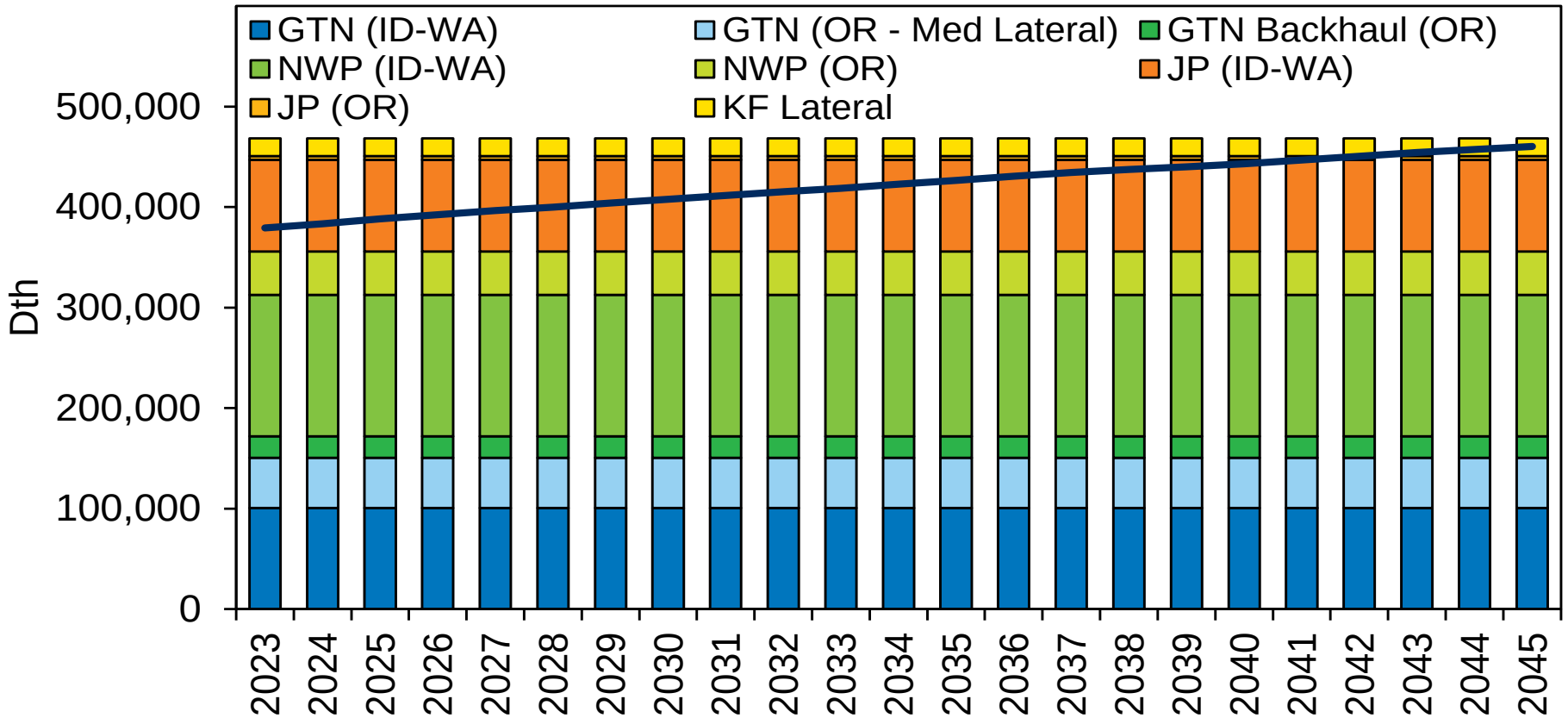


IRP	Avg. Annual Growth 2023-2045
2023	0.9%
2021	0.7%



*A lack of indicators for customer growth like legislation restrictions or building codes result in similar growth projections in Oregon

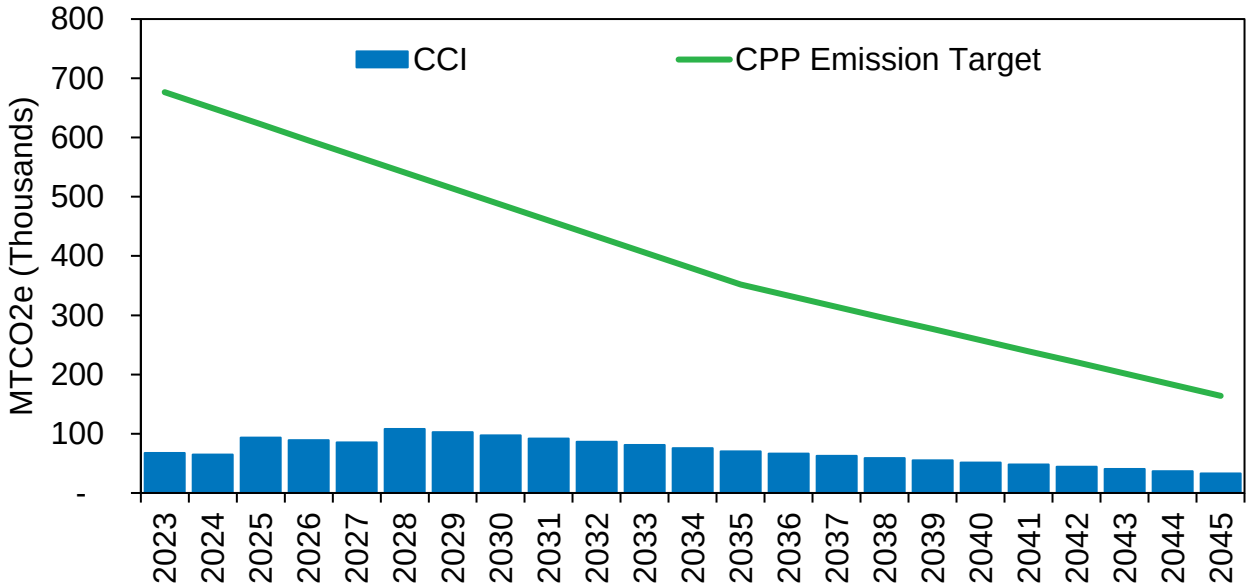
Expected Peak Day Demand Compared to Storage & Transport Rights



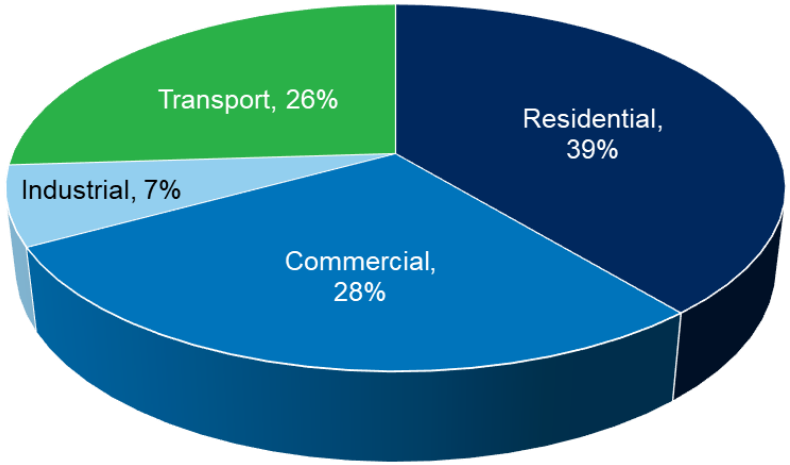
*No Capacity deficiency on peak or average days

Climate Protection Plan

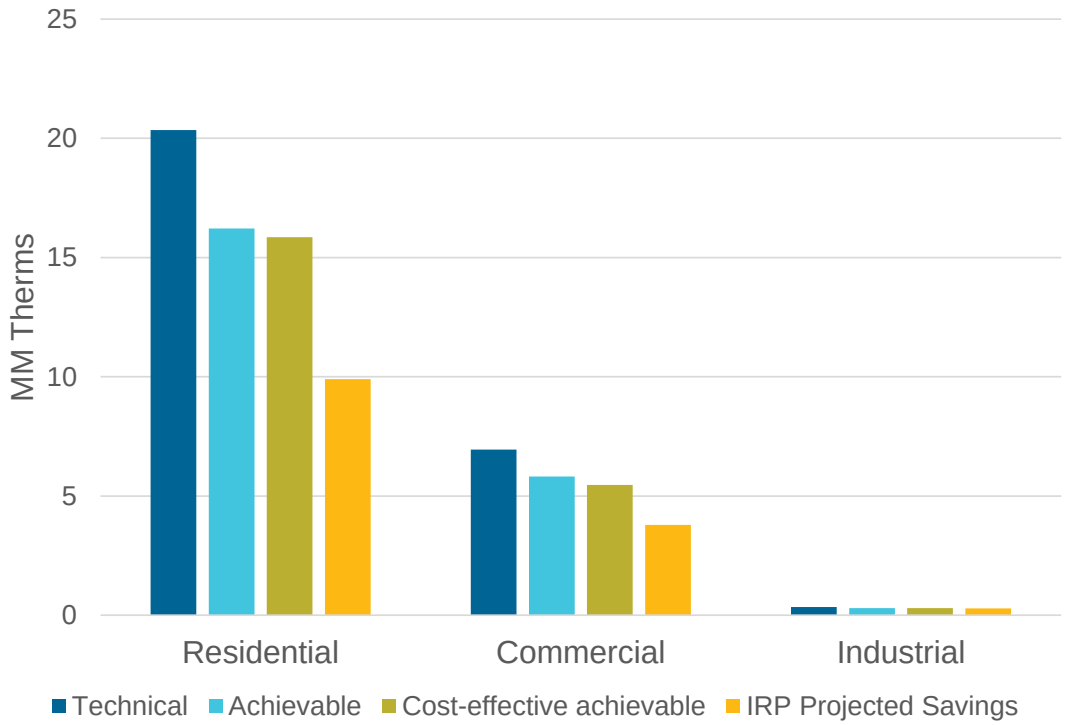
	Climate Protection Plan
Emissions Goal	90% Reduction by 2050
Included Emissions	All non-thermal Avista emissions
Target Baseline	2017 - 2019
Program offsets	Community Climate Investments
Prices of program offsets (2023)	($123) Prices Increase by ($1 + CPI)
Compliance Period	Every 3 Years starting 2022



Oregon 2022 Emissions by Class



ETO – Firm Customers CPA



(Millions of Therms)	Technical Potential	Achievable Potential	Cost-Effective Achievable Potential	Energy Trust Deployed Savings Projection
Residential	20.3	16.2	15.9	9.9
Commercial	6.9	5.8	5.5	3.8
Industrial	0.4	0.3	0.3	0.3
Exogenous	-	-	-	1.4
Total	**27.6**	**22.3**	**21.6**	**15.3**

Applied Energy Group (AEG) – New CPA Studies

Int Com

Summary of Energy Savings (Dth), Selected Years	2023	2024	2027	2032	2042
Reference Baseline (Dth)	389,600	386,846	380,130	373,268	367,372
Cumulative Savings (Dth)					
Achievable Economic	904	2,441	8,398	23,243	47,598

Transport

Summary of Energy Savings (Dth), Selected Years	2023	2024	2027	2032	2042
Reference Baseline (Dth)	2,782,962	2,782,624	2,781,477	2,779,303	2,775,037
Cumulative Savings (Dth)					
Achievable Economic	9,534	28,080	84,925	184,338	361,139

Int Ind

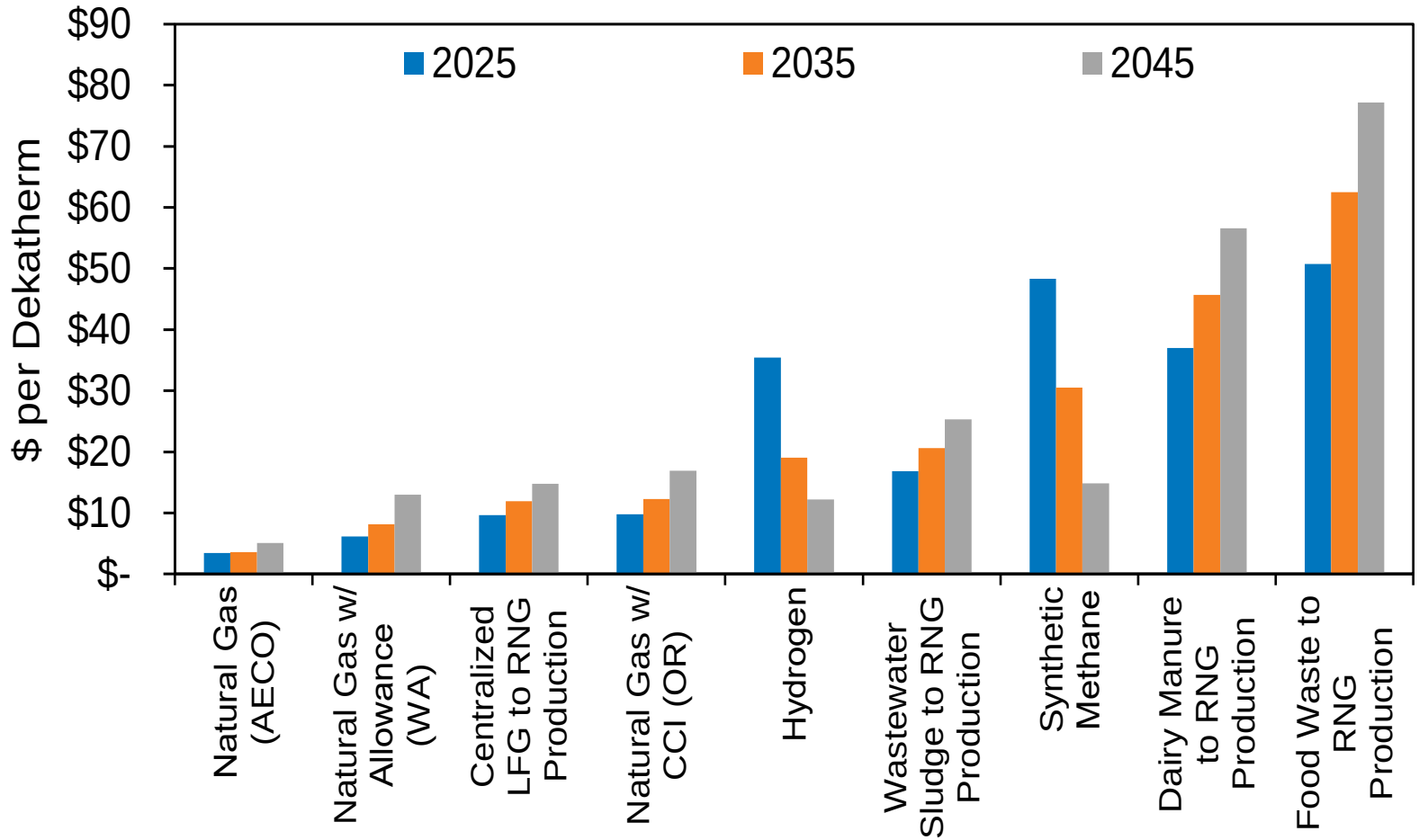
Summary of Energy Savings (Dth), Selected Years	2023	2024	2027	2032	2042
Reference Baseline (Dth)	1,509,283	1,507,701	1,503,695	1,499,146	1,494,147
Cumulative Savings (Dth)					
Achievable Economic	7,690	20,982	63,008	141,741	252,992

Low Income

	2023	2024	2025	2035	2045
Baseline Projection (Dth)	914,784	919,566	924,873	999,238	1,128,049
Cumulative Savings (Dth)					
Achievable Economic Potential	3,816	7,383	12,114	60,487	99,838
Achievable Technical Potential	8,877	18,471	30,274	165,088	205,045
Technical Potential	14,319	28,147	44,987	226,689	295,472
Cumulative Savings (% of Baseline)					
Achievable Economic Potential	0.4%	0.8%	1.3%	6.1%	8.9%
Achievable Technical Potential	1.0%	2.0%	3.3%	16.5%	18.2%
Technical Potential	1.6%	3.1%	4.9%	22.7%	26.2%

- Transportation energy efficiency- Avista has filed a data sharing waiver with the OPUC which should be on the July 11th agenda. If approved program could launch within 1-2 months after.
- Interruptible energy efficiency- ETO launched program end of March.
- Low Income Residential pre-program design has begun and will continue over the summer.

Resource Options



Resource Options Highlights

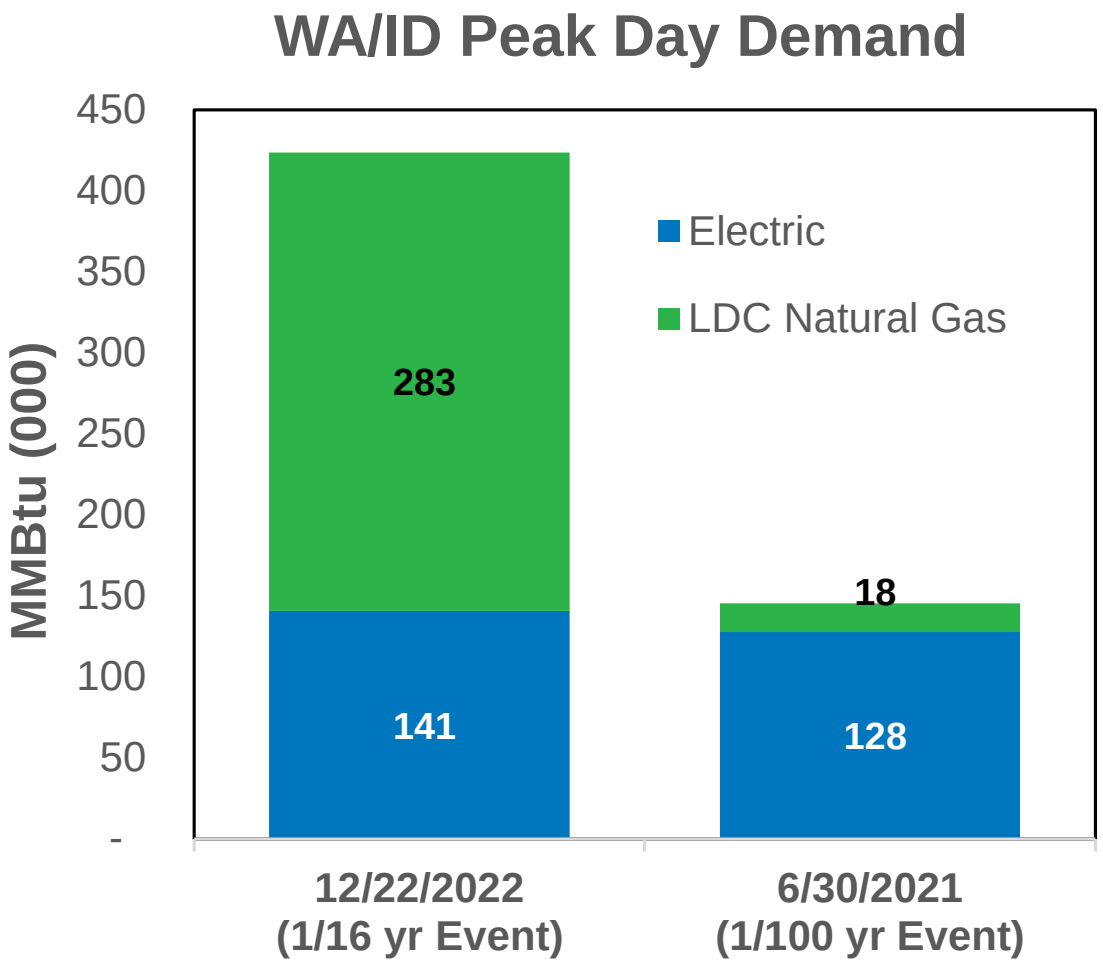
- Synthetic Methane added to options
- Green Hydrogen added to options
- Electrification (by planning areas in OR and WA) added to options
- RNG (dairy, waste water, food, landfill)
- Allowances (WA CCA program)
- Community Climate Investment (OR CPP program)
- Natural Gas (6 supply basins)
- New EE program CPAs

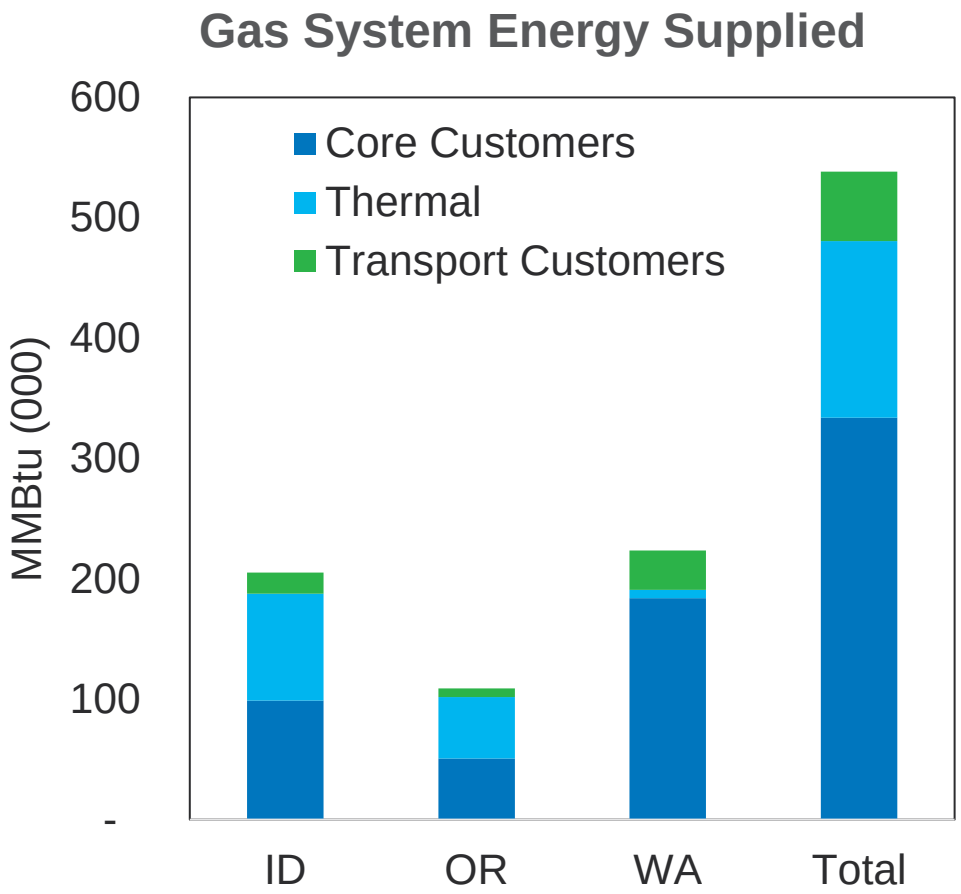
*Electrification by planning area was also included as a resource option (Was not selected)

Energy Demand (MMBtu)
December 22, 2022

Weather Area	Min	Max	Average
La Grande	0	17	8.5
Klamath Falls	32	36	34
Medford	40	44	42
Roseburg	34	38	36
Spokane	-8	4	-2

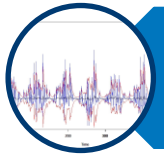
ºFahrenheit





Convert MWh to mmBTU by 3.412 factor, natural gas load does not include large loads who purchase their own natural gas

Electrification



Forecasted Customers and coefficients

Expected use and customers by area and class

Forecasted Daily Temperature

Daily temperature by planning area (La Grande, Roseburg, Klamath Falls, Medford – Oregon)

Electric Rates by Area

Did not include basic charge. These costs are by class and based on rates from the electric provider in the area.

Expected Efficiency curve of end use for conversion of gas load to electric load

The increased efficiency of using an electric heat pump, water heater or stove to calculate energy needed

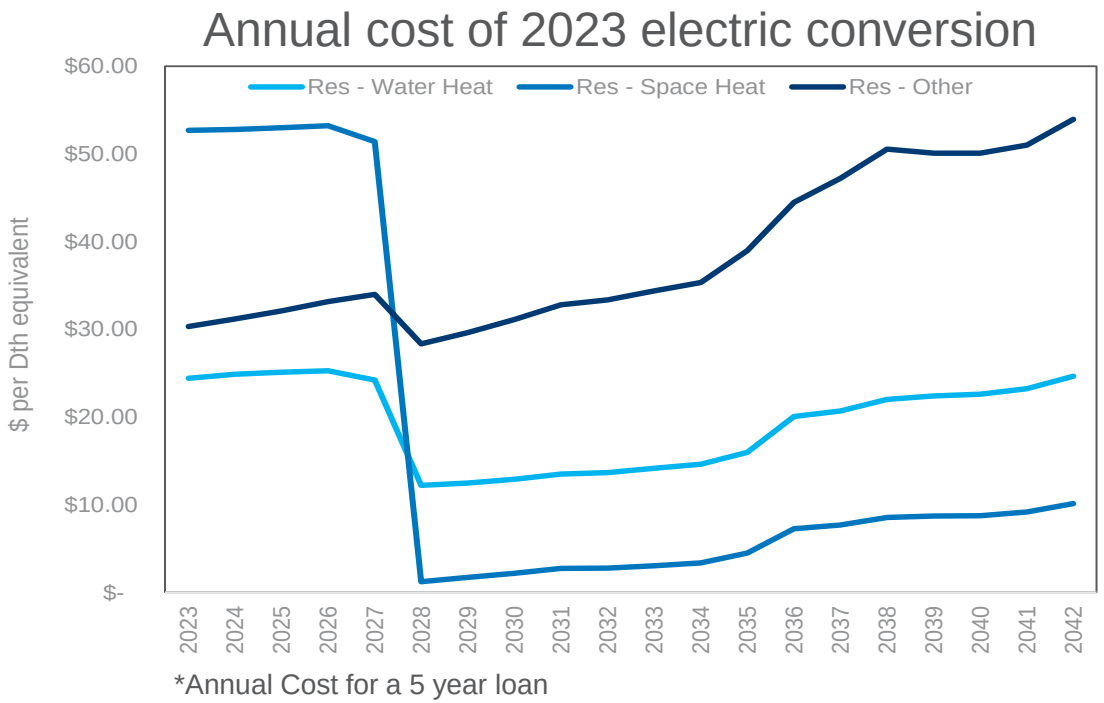
Conversion Costs & incentives (IRA, grants, other)

Conversion costs are based on a study from retrofits. Inflation Reduction Act impacts assume a 50% reduction in costs.

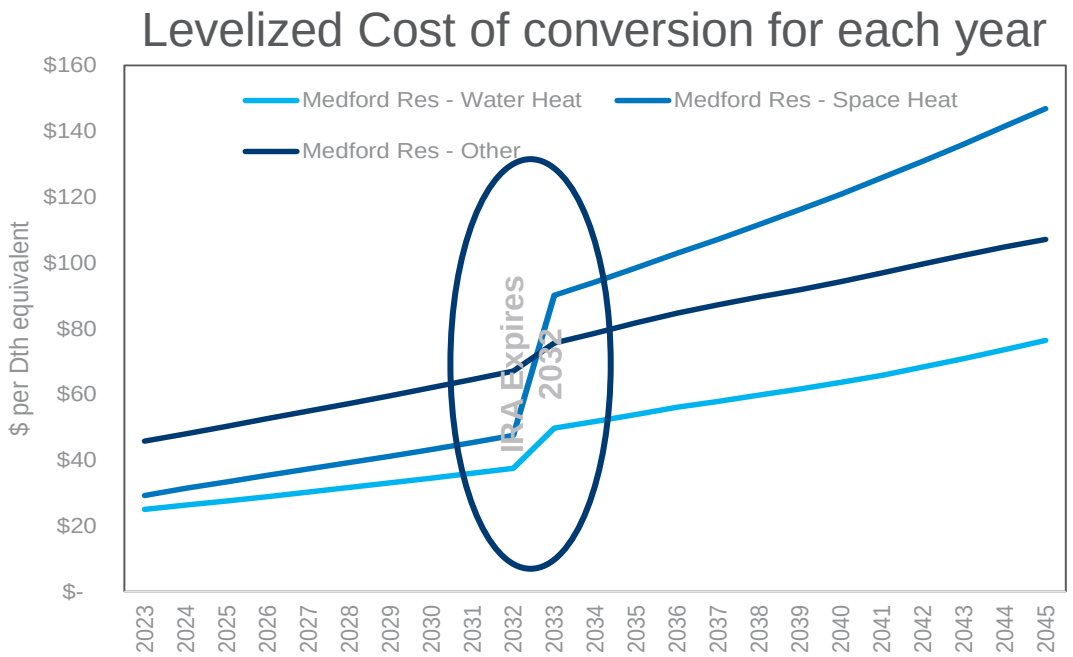
Electrification - Medford

- Levelized Cost for 2023 Conversion:
  - Res Water heat $25.01
  - Res Space Heat $29.20
  - Res – Other $45.77

A levelized 20-year cost is calculated each year to account for capital costs of conversion



*Annual Cost for a 5 year loan



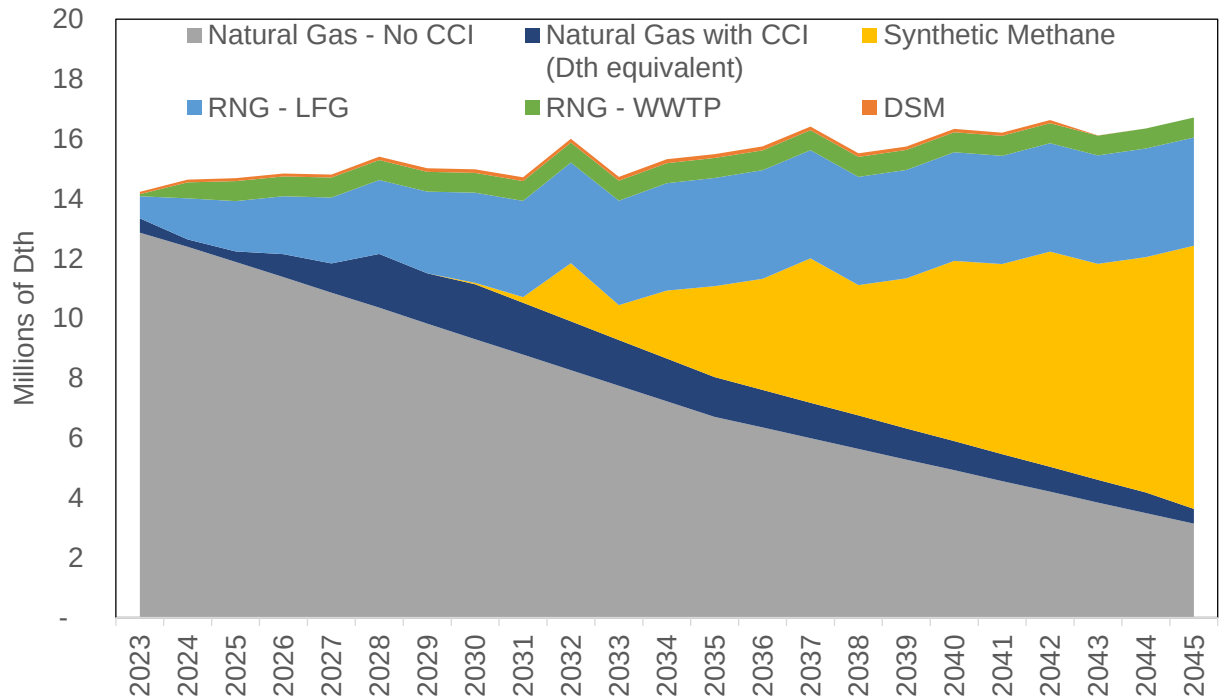
Customer conversion rates are forecasted as a monthly payment for 5 years at 3% interest.

Non-pipe solutions

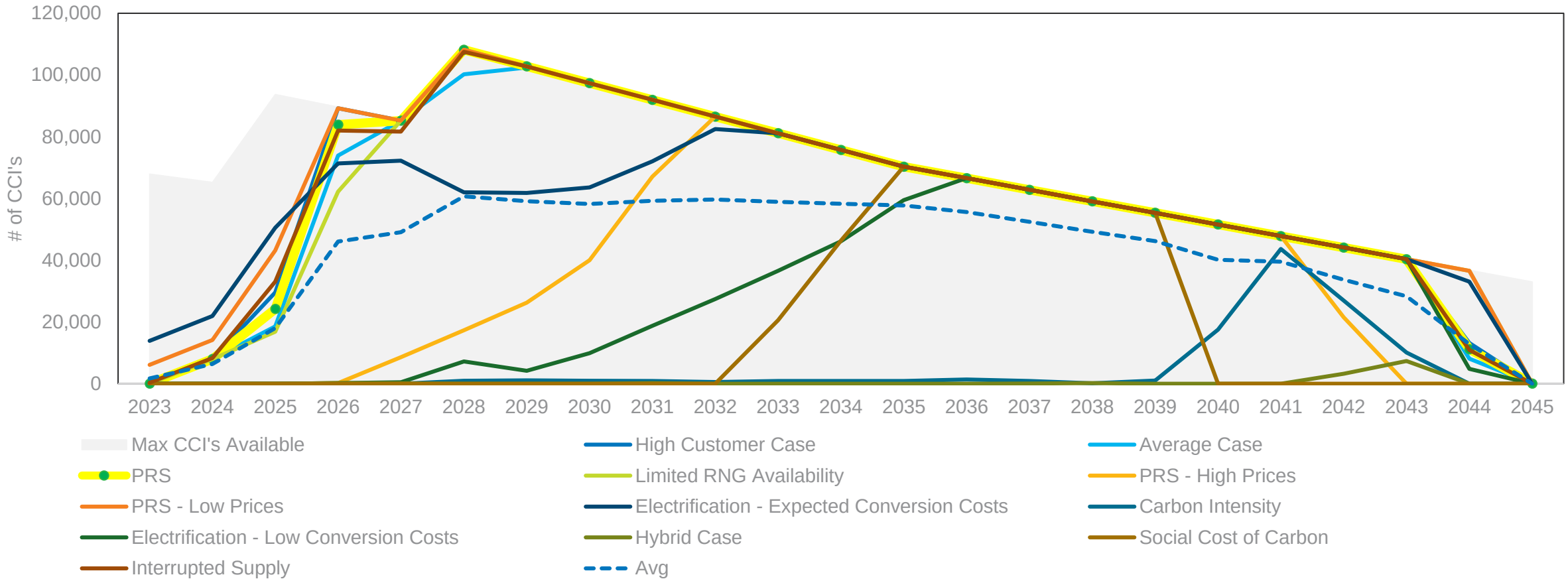
- Hybrid Heating Pilot
  - ETO is finalizing pilot program design and is set to launch before end of summer.
- New EE programs to include all customer classes
- Targeted Energy Efficiency-
  - Avista has sent ETO the areas to evaluate for a potential targeted program. Launch would be in 2024 if evaluation determines enough savings potential.
- Distribution planning
  - Possible non-pipe alternatives include, but are not limited to, the following:
    - uprating (raising) the existing pipeline pressure;
    - energy efficiency efforts including encouraging customers to adopt more efficient appliances and equipment;
    - and potentially electrification of natural gas appliances.
- Elasticity
  - Included in prior IRPs
  - With multiple fuels and resources calculating price elasticity, the ability to accurately model within PLEXOS was not determined in the 2023 IRP.
  - Avista expects this to be available in the 2025 IRP with end use modeling
  - Considered with electrification (cross product)
- Energy Burdon
  - Non-Energy Impact (NEI) values will be studied and included in the 2025 IRP.

Oregon Preferred Resource Strategy

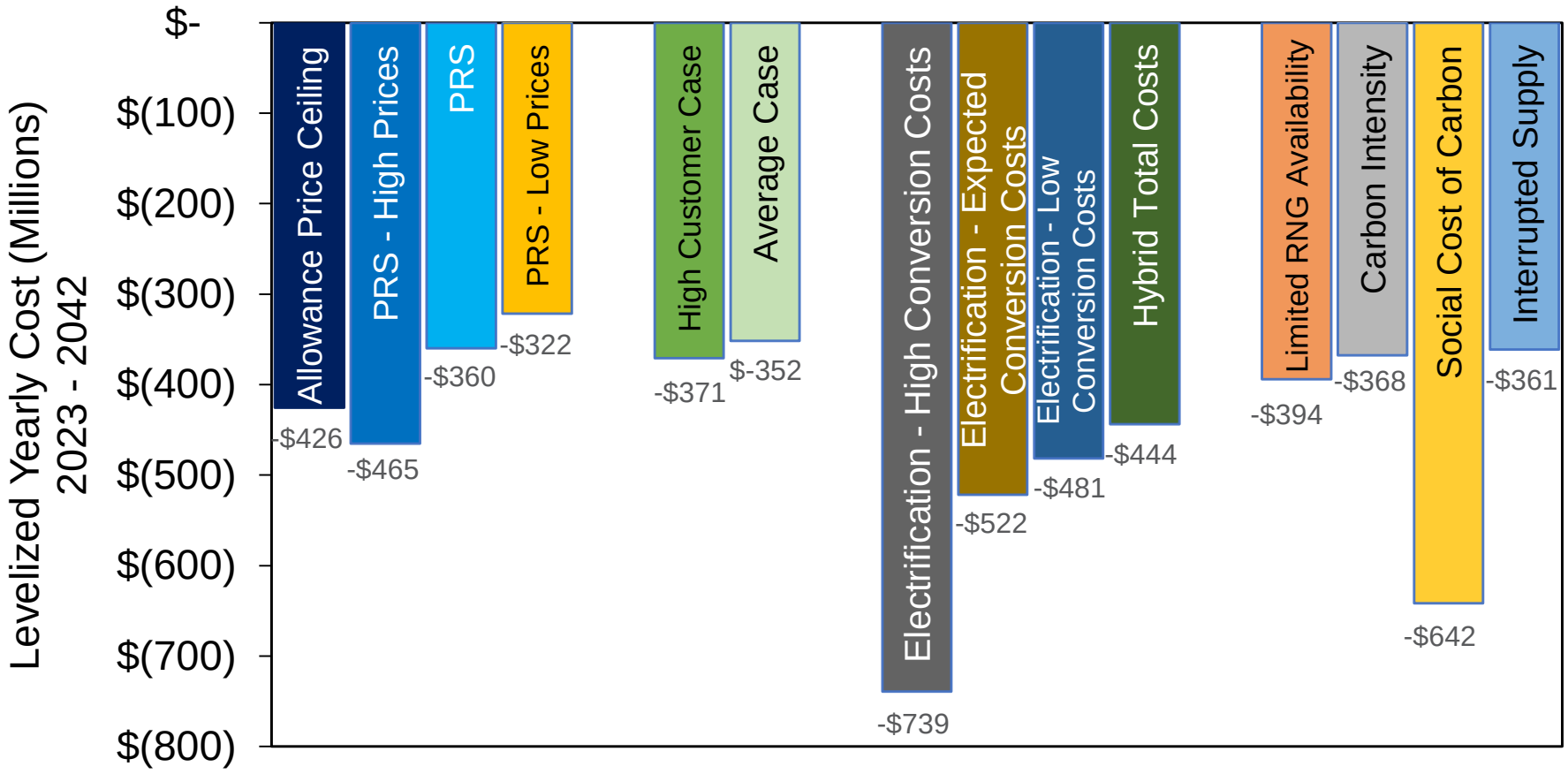
- RNG is modeled as expected price per Dth by source. It includes the energy and emissions offset (RTC)
  - Renewable thermal credits were not modeled specifically.
  - In the event RNG cannot be procured for the estimated prices, CCI's specifically would be purchased in its place for compliance. (least cost methodology)
- CCIs, RNG, Natural Gas, Synthetic Methane and Energy Efficiency are chosen as resources



CCIs


120,000
100,000
80,000
60,000
40,000
20,000
0
# of CCI's
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
Max CCI's Available
High Customer Case
Average Case
PRS
Limited RNG Availability
PRS - High Prices
PRS - Low Prices
Electrification - Expected Conversion Costs
Carbon Intensity
Electrification - Low Conversion Costs
Hybrid Case
Social Cost of Carbon
Interrupted Supply
Avg

Alternative Scenarios Cost



*Costs do not include General and Administrative costs.

Action Items

1. **Purchase Community Climate Investments for compliance to the Climate Protection Plan for years 2022, 2023, 2024, 2025 and 2026 to comply with Executive Order 20-04.**
2. **ETO identified 546,000 therms in the 2023 IRP verses 427,000 therms of planned savings in the 2023 ETO Budget and Action Plan. Avista will work with ETO to meet IRP gross savings target of 568,000 therms in 2024.**
3. **New program offered by ETO for interruptible customers in 2023 to save 15,000 therms.**
4. **Engage Oregon stakeholders to explore additional new offerings for interruptible, transport, and low-income customers to work towards identified savings of 375,000 therms in 2024.**
5. **In Oregon, acquire 8.64 million therms of RNG in 2023 and 21.80 million therms of RNG in 2024.**
6. In Washington purchase allowances or offsets for compliance to the Climate Commitment Act for years 2023, 2024, 2025 and 2026 to comply with emissions reduction targets.
7. Begin to offer a Washington transport customer EE program by 2024 with the goal of saving 35,000 therms
8. **Explore methods for using Non-Energy Impact (NEI) values in future IRP analysis to account for social costs in Washington to ensure equitable outcomes.**
9. **Explore using end use modeling techniques for forecasting customer demand.**
10. **Consider contracting with an outside entity to help value supply side resource options such as synthetic methane, renewable natural gas, carbon capture, and green hydrogen. (will use in Oregon as well)**
11. **Regarding high pressure distribution or city gate station capital work, Avista does not expect any supply side or distribution resource additions to be needed in our Oregon territory for the next four years, based on current projections. However, should conditions warrant that capital work is needed on a high-pressure distribution line or city gate station in order to deliver safe and reliable services to our customers, the Company is not precluded from doing such work. Examples of these necessary capital investments include the following:**