



2023 Integrated Resource Plans

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Avistas System Map

Jurisdiction	Electric Customers	Natural Gas Customers
ID	144,000	92,000
OR	N/A	105,000
WA	269,000	175,000
Total	413,000	372,000

**Avista
Service
Territory**

Electric ■
 Natural Gas ■
 Electric and Natural Gas ■



Public Engagement Process

- Natural Gas IRP
 - Five public technical advisory committee meetings (Feb 2022 to March 2023)
- Electric IRP
 - Seven public technical advisory committee meetings (Dec 2021 to April 2023)
- Joint IRP Customer Meeting in March 2023
 - Held 2 on-line public Q&A meetings for customers
 - Included recording of the IRP presentations
 - Customer polling for instant feedback
- All presentations available on company website, including recordings of the meetings where available
- Data inputs available publicly on the website
- Avista is always open to meeting with any interested parties

Electrification / Building Codes

Electric IRP

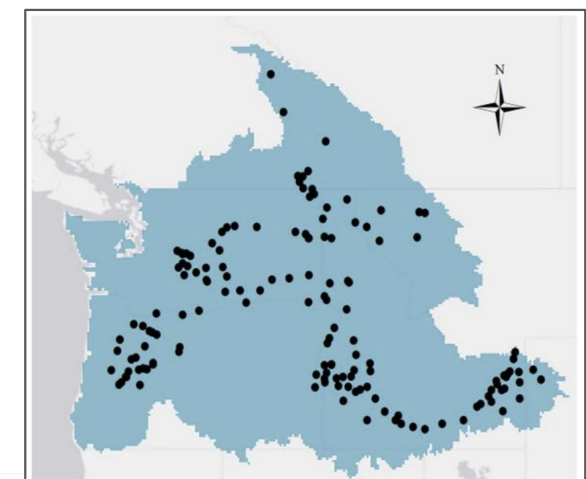
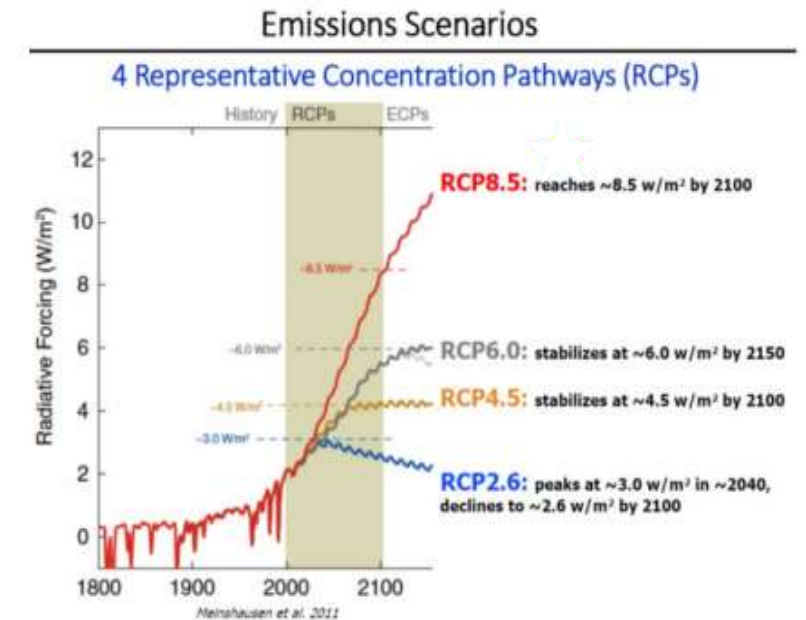
- Avista's load forecast includes additional water and space heating loads for new customers using natural gas as backup fuel when temperatures are below 40 degrees.
- Medium and light duty vehicle electrification is assumed in the load forecast; by 2045, 27% of light duty vehicles and 13% of medium duty vehicles are assumed to be electric.
- Higher electrification scenarios were also considered.

Gas IRP

- Building Codes changes apply to new commercial or residential customers. These new customers are only considered space heat users when temperatures are below 40 degrees.
- Electrification of existing customers is available as a demand side resource option to residential and commercial classes in every scenario for all years for space heat, water heat, other (stoves, dryers).
- Electrification scenarios include a 2% yearly reduction in customers from current Commercial and Residential customer counts.

Representative Concentration Pathways

- Description by Intergovernmental Panel on Climate Change (IPCC)
 - RCP 2.6 – stringent mitigation scenario
 - RCP 4.5 & RCP 6.0 – intermediate scenarios
 - RCP 8.5 – very high GHG emissions
- RMJOCII Study evaluated RCP 4.5 and RCP 8.5
- RCP 4.5 and RCP 6.0 similar within the IRP planning horizon



	Scenario	2046-2065		2081-2100	
		Mean	Likely range	Mean	Likely range
Global Mean Surface Temperature Change (C°)	RCP 2.6	1.0	0.4 to 1.6	1.0	0.3 to 1.7
	RCP 4.5	1.4	0.9 to 2.0	1.8	1.1 to 2.6
	RCP 6.0	1.3	0.8 to 1.8	2.2	1.4 to 3.1
	RCP 8.5	2.0	1.4 to 2.6	3.7	2.6 to 4.8



2023 Natural Gas Integrated Resource Plan

Tom Pardee

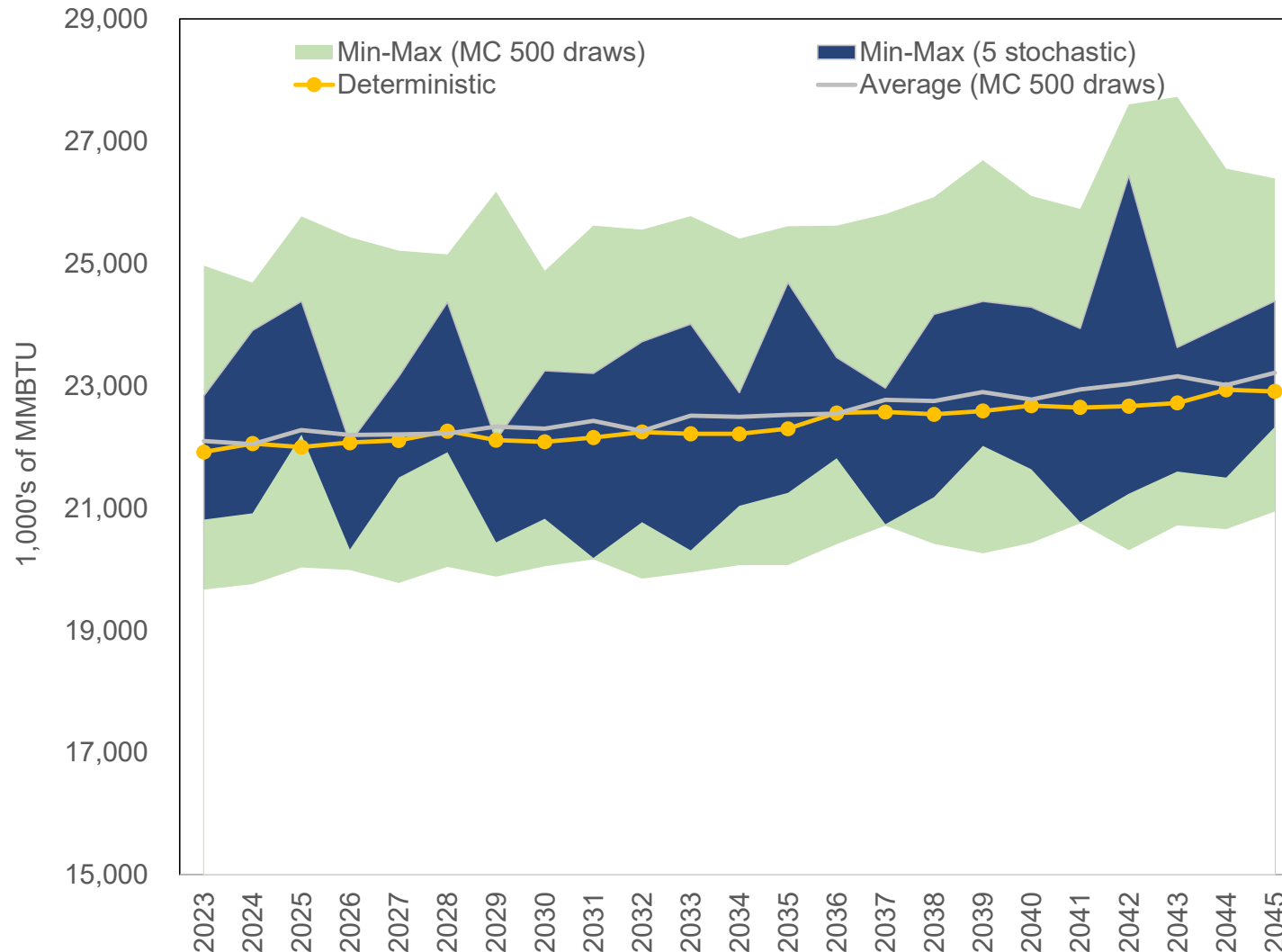
Natural Gas Planning Manager



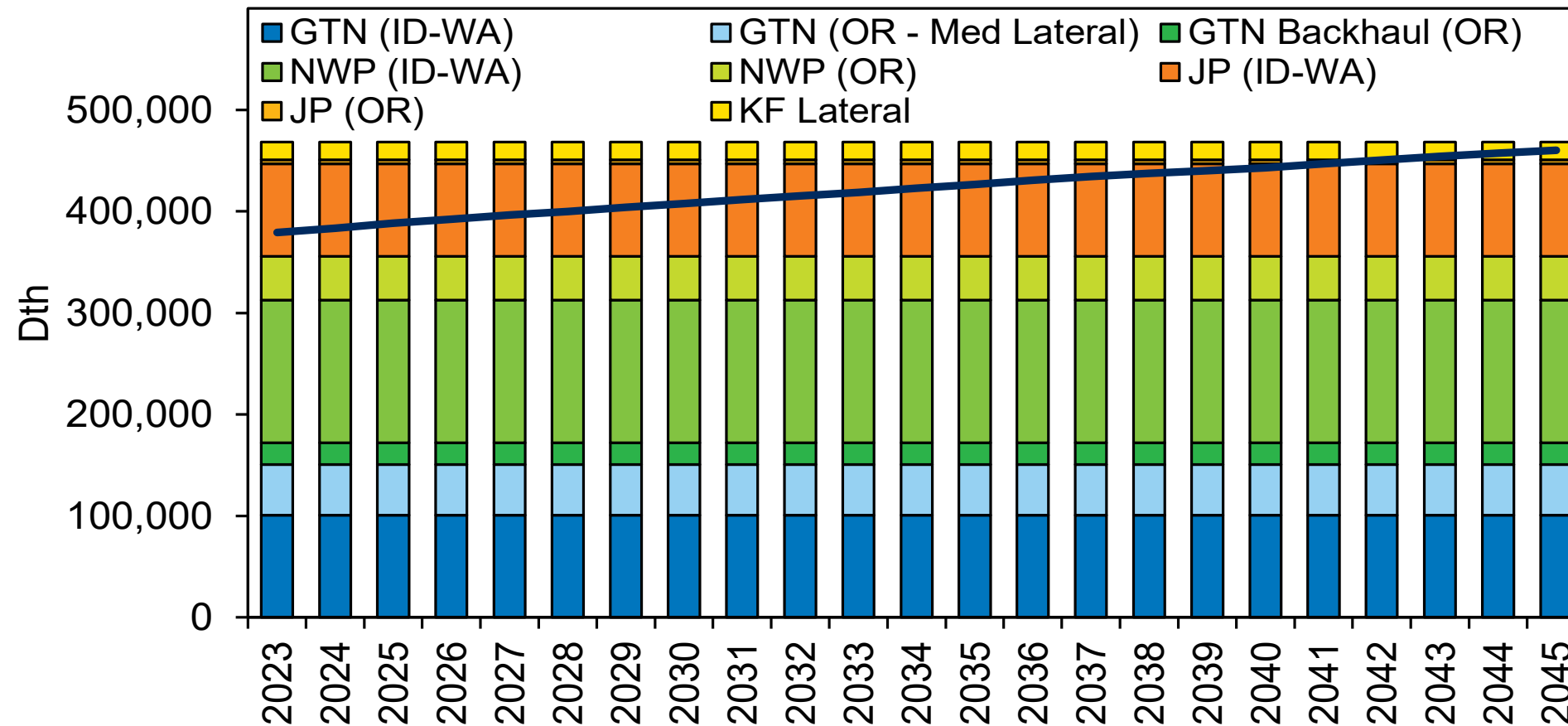
Customers and Load Forecast

Highlights

- Deterministic used for capacity planning
- 5 Stochastic futures used for resource needs to account for load variability
- 500 Monte Carlo 20-year futures used for risk
- New Customers treated as “Hybrid” heating



Expected Peak Day Demand Compared to Storage & Transport Rights



Resource Options

Clean Resources

- Green Hydrogen
- Synthetic Methane
- Dairy RNG
- Landfill RNG
- Food Waste RNG
- Wastewater RNG

Fossil Fuel Resources

- Natural Gas

Program Resources

- Allowances
- Offsets

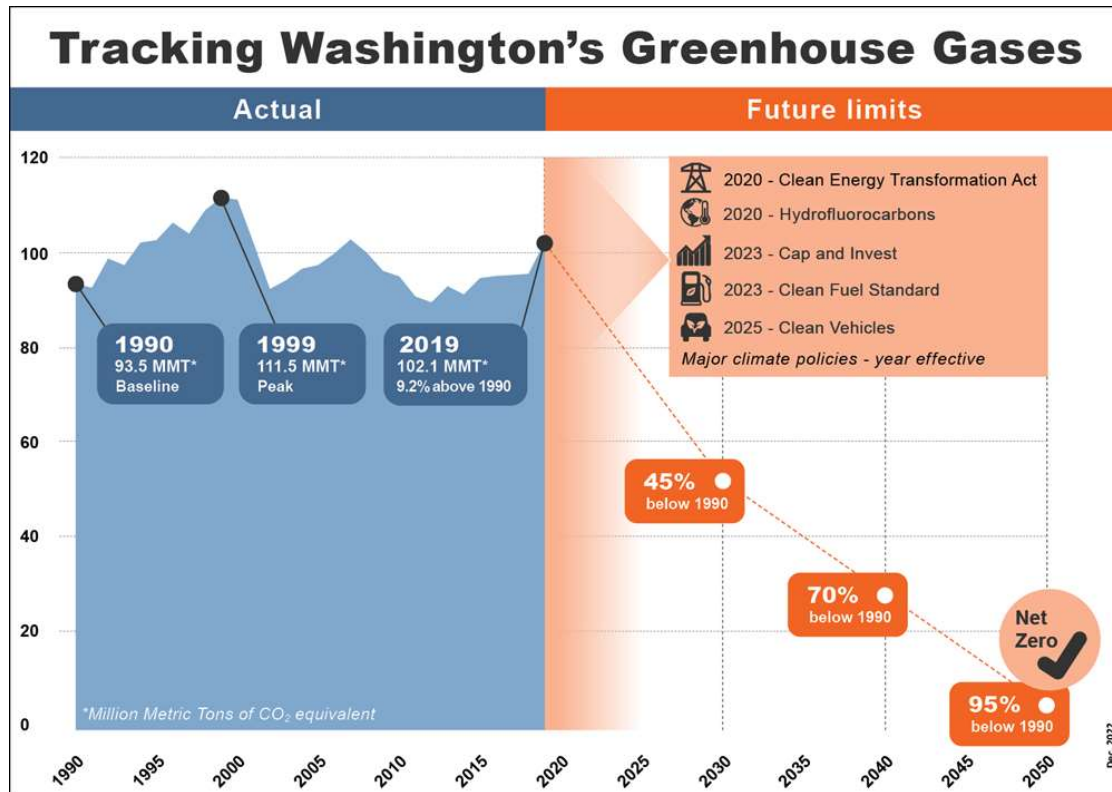
Demand Resources

- Energy Efficiency
- Electrification
- Demand Response

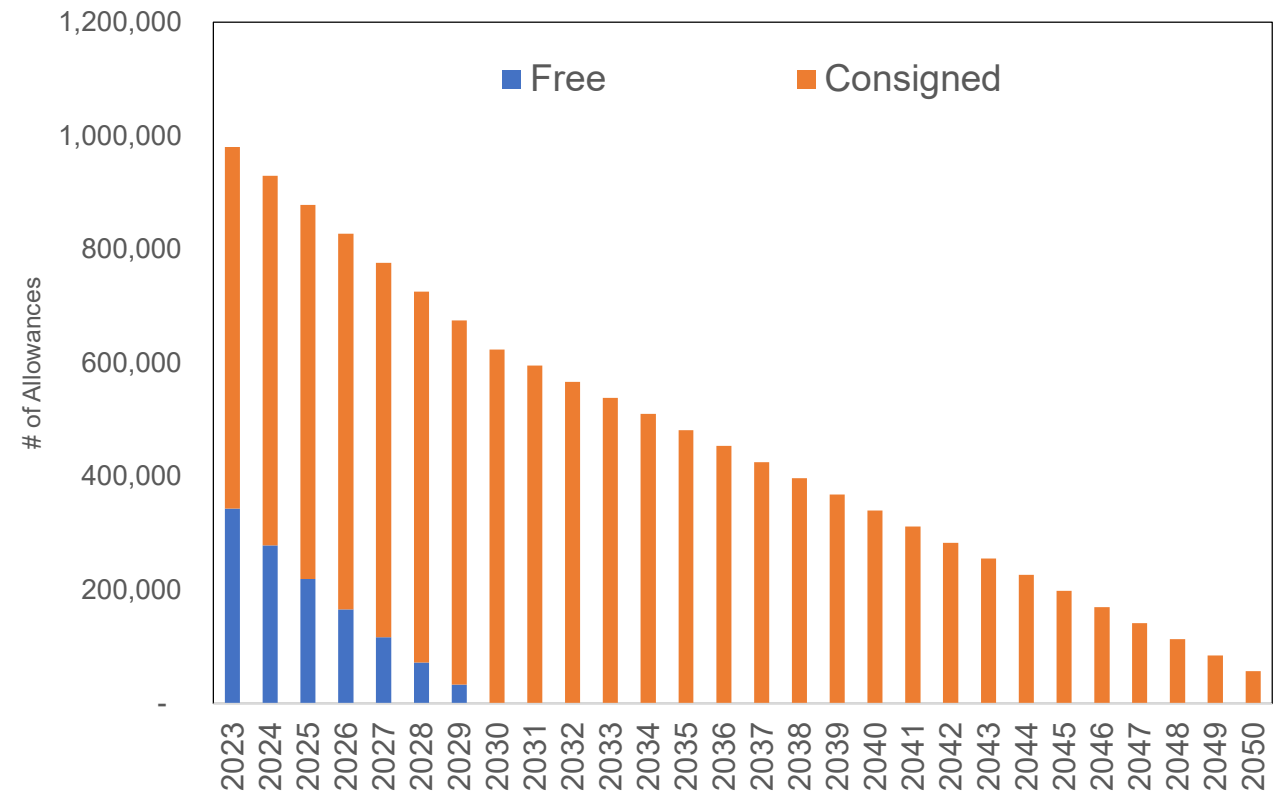
Infrastructure

- Jackson Prairie Owned and Leased Storage
- Interstate Transport

Climate Commitment Act



Avista Natural Gas Estimated Allowances

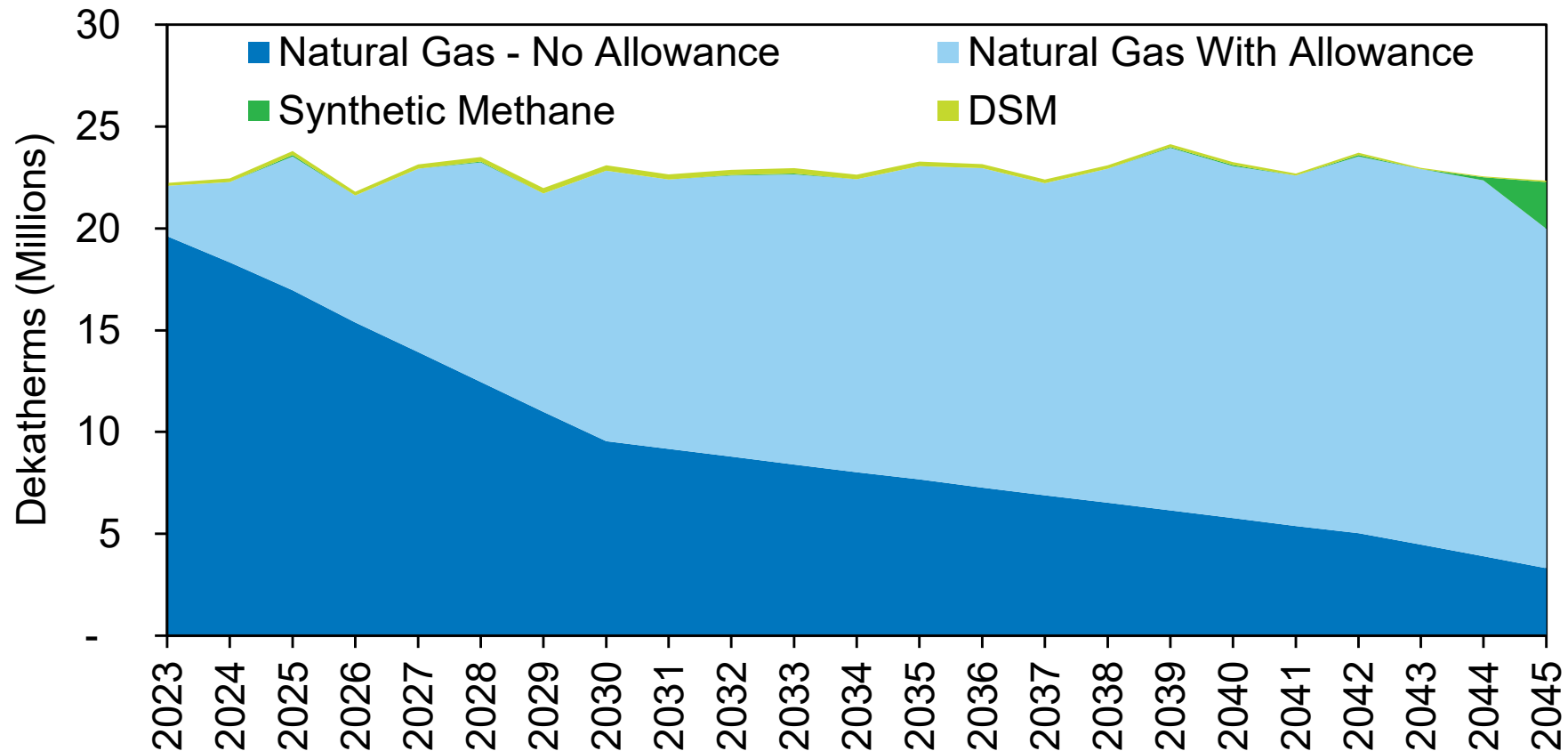


Avista assumes the Washington's program joins California and Quebec in 2025

Washington Preferred Resource Strategy / Energy Efficiency

Energy efficiency (DSM)

- Interruptible CPA (New to 2023 IRP)
- Transport CPA (New to 2023 IRP)
- Firm customer CPA



Alternative Scenarios Cost

Scenario	Conclusion
Average Case	Capacity needs on a peak day from historic weather continue to be met with current resources
Carbon Intensity	Less RNG is selected in Oregon as compliance considers carbon intensity such as Dairy RNG
Electrification - Expected Conversion Costs	Only High Electrification and SCC scenarios have a higher cost. No additional electrification selected
Electrification - High Conversion Costs	Highest cost scenario in the 2023 IRP. No additional electrification selected
Electrification - Low Conversion Costs	Selects additional electrification (not forced) due to low conversion costs
High Customer Case	Unlikely scenario considering policy and codes. Slightly more synthetic methane chosen in 2045
Hybrid Case	Lowest cost for converting customers to power grid with a gas back up
Interrupted Supply	Selects higher RNG than other cases for reliability
Limited RNG Availability	Selects electrification in Southern Oregon
PRS	Natural Gas and allowances are selected in WA with Synthetic Methane added after 20+ years in forecast
PRS - Allowance Price Ceiling	RNG selected in 2023 due to high Allowance price costs but only 29,000 Dth, hydrogen additional RNG selected in 2040. Synthetic Methane is selected in 2042, providing most of the energy supply in Washington (78% in 2042)
PRS - High Prices	Additional Hydrogen and RNG is selected in Oregon
PRS - Low Prices	Low Natural Gas prices do not drastically change resource selection
Social Cost of Carbon	Fully move to synthetic methane or alternative fuel beginning 2043

Looking ahead - 2025 IRP

- Consider equity through non energy impact study
- Further study alternative fuel costs and options
- Implement an end use model for price elasticity and load impacts between electric and gas
- Further explore feasibility and cost effectiveness of offset projects for CCA compliance



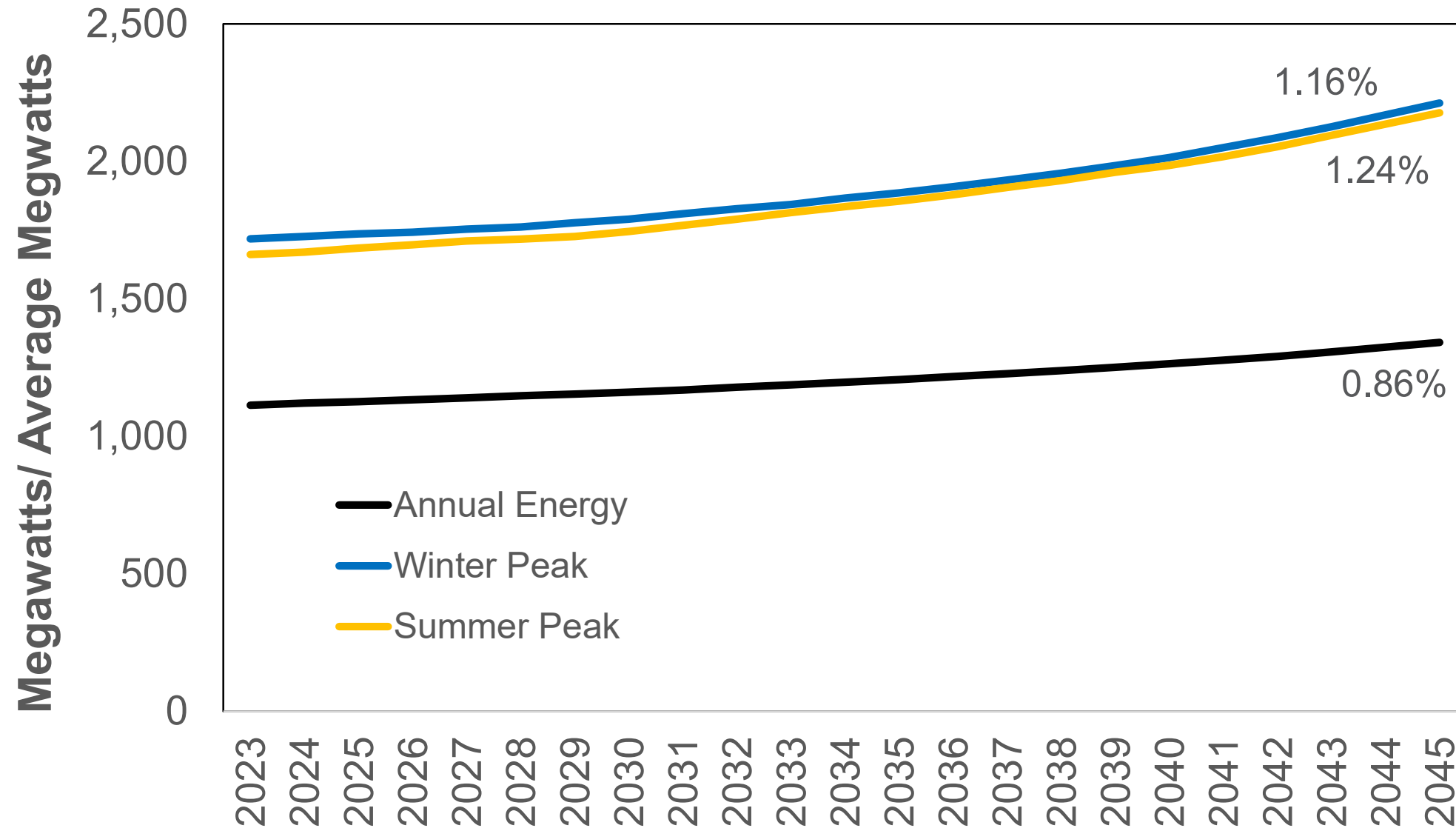
2023 Electric Integrated Resource Plan

James Gall

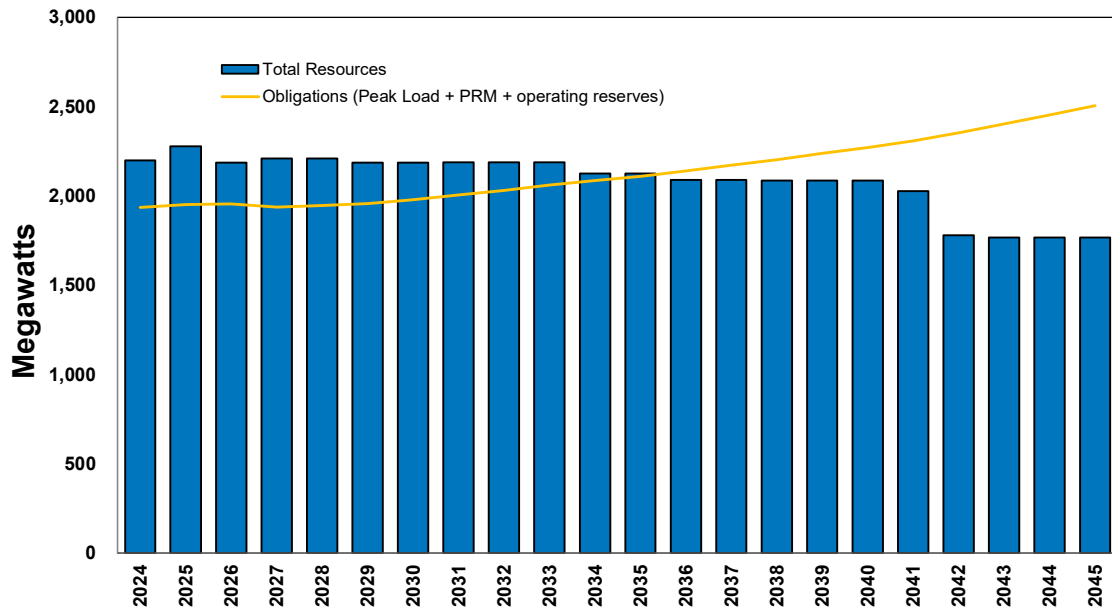
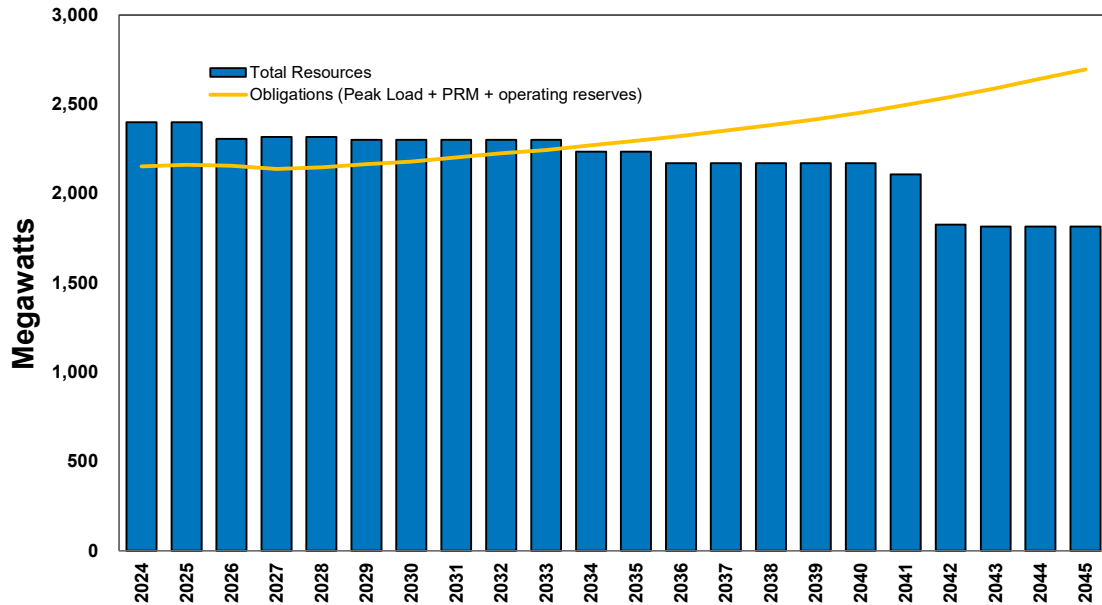
Manager of Integrated Resource Planning



Load Forecast & Growth Rates



Resource Position



Energy Position

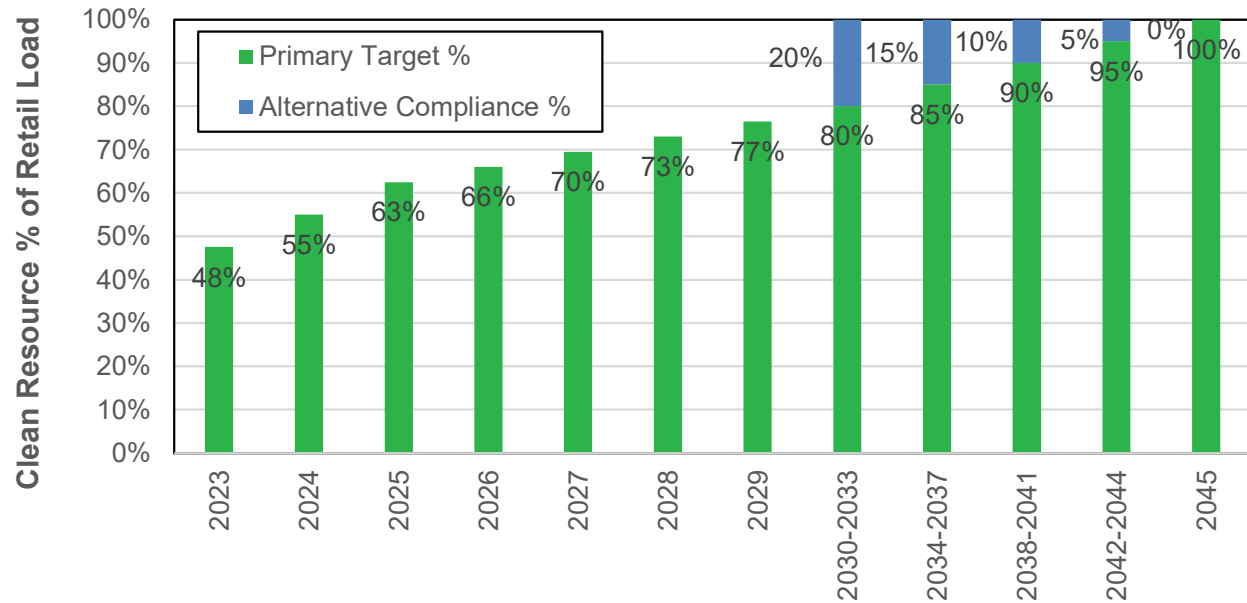
Month	2025	2030	2035	2040	2045
January	218	109	35	-3	-829
February	216	76	27	-26	-823
March	375	260	210	168	-603
April	551	427	360	311	-326
May	691	604	540	486	-17
June	737	621	540	447	-175
July	395	240	200	104	-672
August	266	135	59	-8	-766
September	339	222	176	135	-603
October	346	218	148	81	-677
November	261	116	27	-20	-818
December	297	147	69	-17	-851

Assumed Retirements

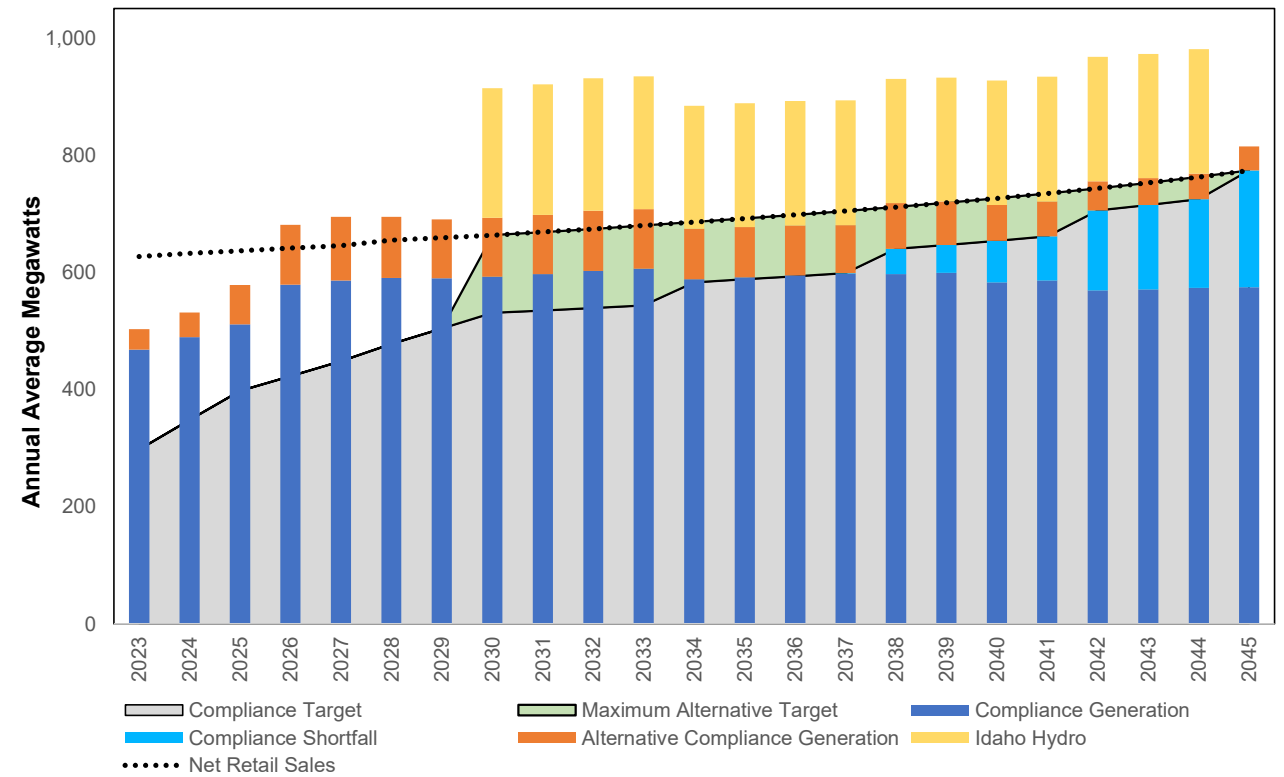
Resource	Fuel Type	Year	January Capacity MW
Colstrip Units 3 & 4	Coal	2025	222.0
Northeast Units A & B	Natural Gas	2035	66.0
Boulder Park (1-6)	Natural Gas	2040	24.6
Kettle Falls CT	Natural Gas	2040	11.0
Rathdrum Units 1 & 2	Natural Gas	2044	176.0
Total			499.6

CETA Renewable Energy Goal

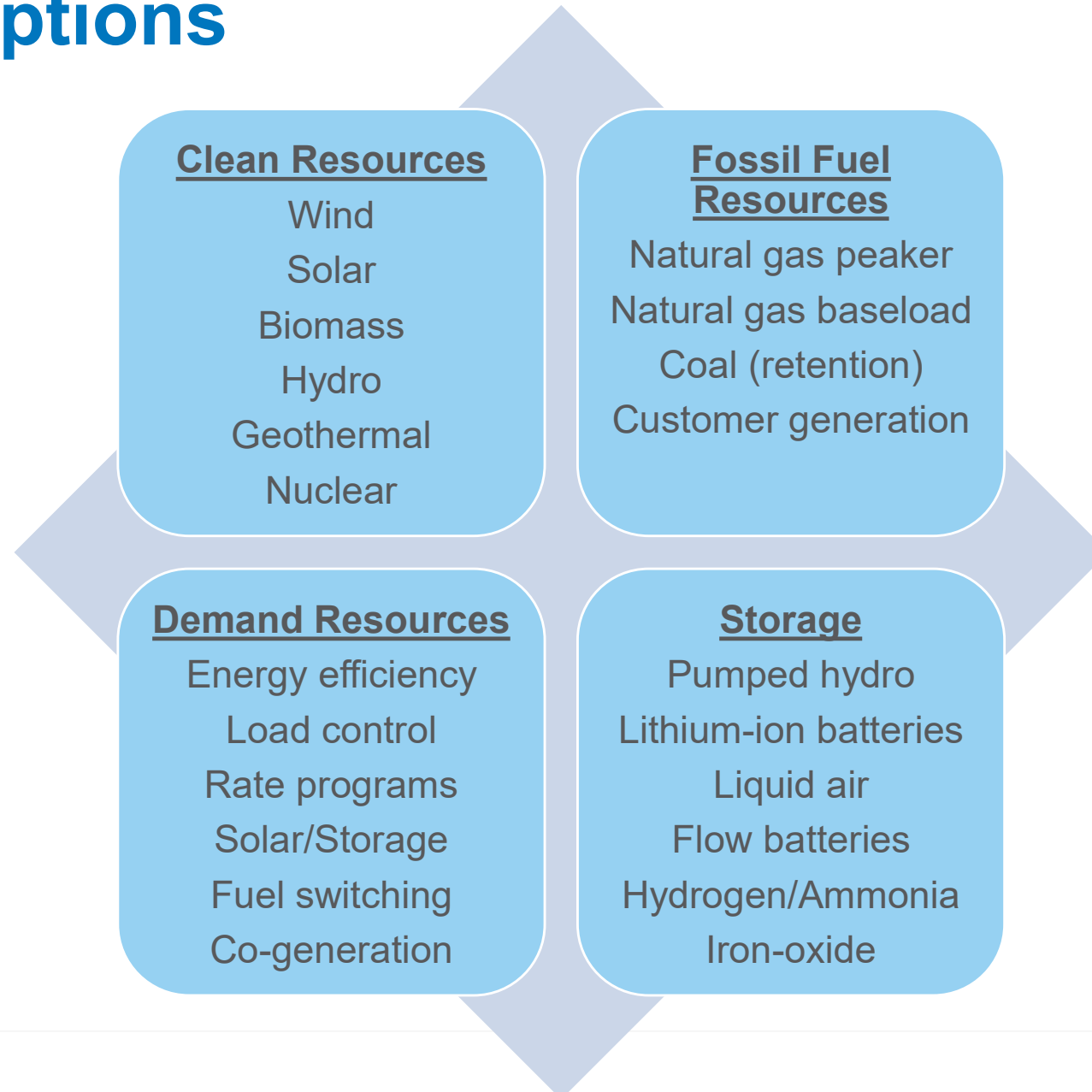
Potential CETA Requirements



CETA Position



Resource Options



Equity Considerations

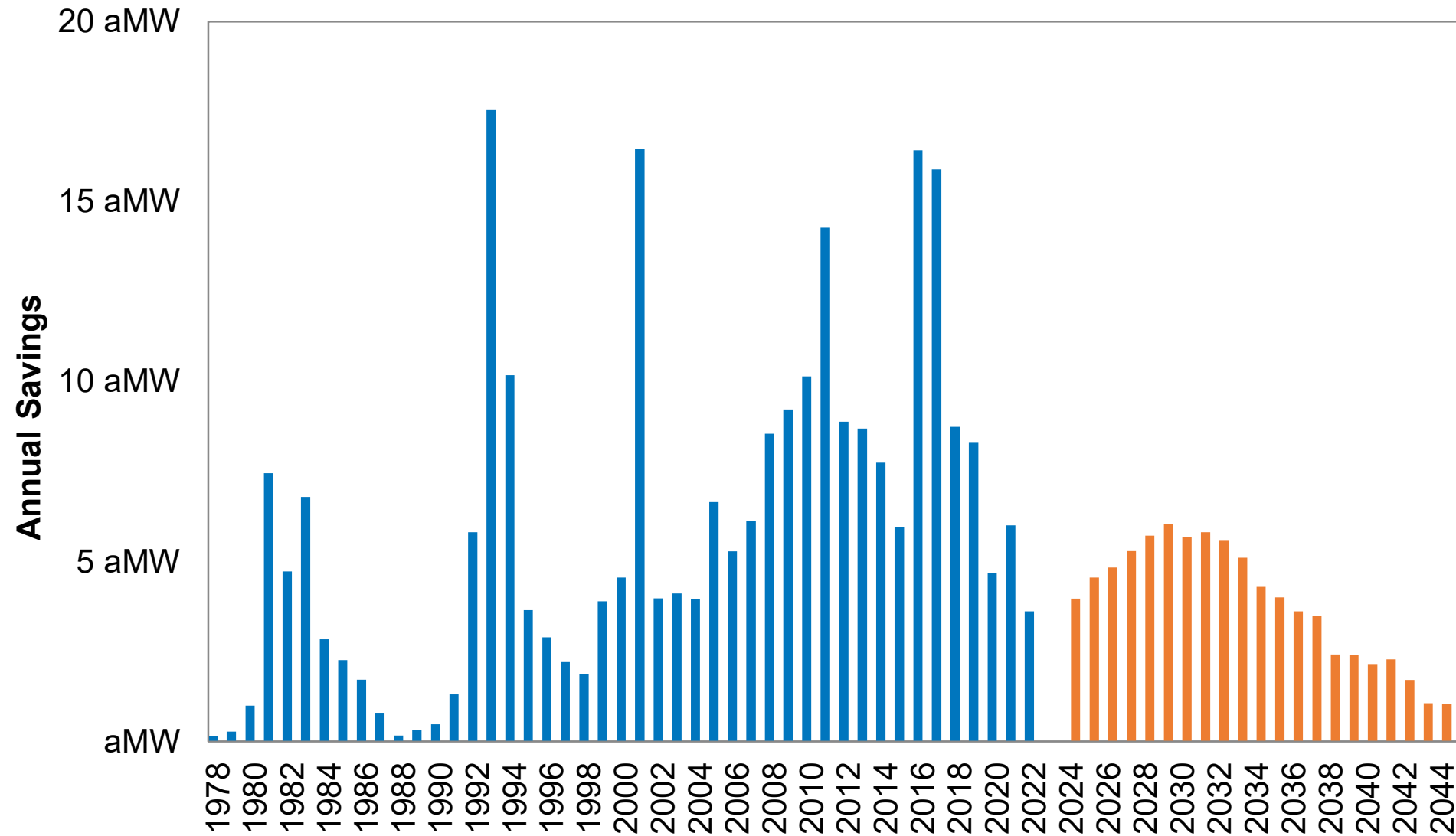
Ensure all customers benefit from the transition to clean energy:

- Equitable distribution
- Reduction of burden to vulnerable populations and highly impacted communities



- Named Community Investment Fund
- Customer Benefit Indicators
- Societal Costs
 - Social Cost of Greenhouse Gas
 - Non-Energy Impacts
 - Economic, Public Health (emissions), Water, Land Use, and Safety

Annual Historical and Forecasted Energy Efficiency



Demand Response

- 30 MW of industrial demand response already contracted
- Avista is preparing 3 opt-in pilot programs:
 - Time of use rates
 - Peak time rebate
 - CTA-2045 water heaters
- 2023 IRP Selection
 - 2025 start date, only Washington programs selected (2045 cumulative savings shown)
 - Time of Use: 6.6 MW
 - Peak Time Rebate and Variable Peak Pricing is on the margin, but not selected

PRS- Supply-Side Resources Portfolio Changes

Resource	2024-2029	2030-2034	2035-2039	2040-2045	Total
Natural Gas	0	90	0	213	304
Natural Gas Retirements	0	0	(62)	(482)	(544)
Coal Retirements	(222)	0	0	0	(222)
Thermal Total	(222)	90	(62)	(269)	(462)
Hydrogen to Ammonia CT	0	0	88	608	696
Power to Gas Total	0	0	88	608	696
Biomass	11	0	0	0	11
Biomass Total	11	0	0	0	11
Northwest Wind	0	200	0	300	500
Montana Wind	100	200	0	0	300
Wind Total	100	400	0	300	800
Distributed Solar	4	4	1	1	10
Utility-Scale Solar	0	0	0	0	0
Solar Total	4	4	1	1	10
Demand Response	7	0	0	0	7
Demand Response Total	7	0	0	0	7
Short-Duration Storage (<8 hr)	0	0	0	25	25
Medium-Duration Storage (8-24 hr)	0	0	0	0	0
Long-Duration Storage (>24 hr)	0	0	52	0	52
Distributed Storage (<4hr)	0	0	1	2	2
Energy Storage Total	0	0	53	27	79
Hydropower	322	6	0	0	328
Hydropower Contract Expirations	(24)	(88)	0	0	(111)
Hydropower Total	298	(81)	0	0	216
All Resource Total	198	413	80	667	1,357
Additions	444	500	142	1,149	2,234
Subtractions	(246)	(88)	(62)	(482)	(877)

New transmission is needed

- Renewable energy resource connection and delivery
- Ammonia CT connection to load center
- Market interconnect

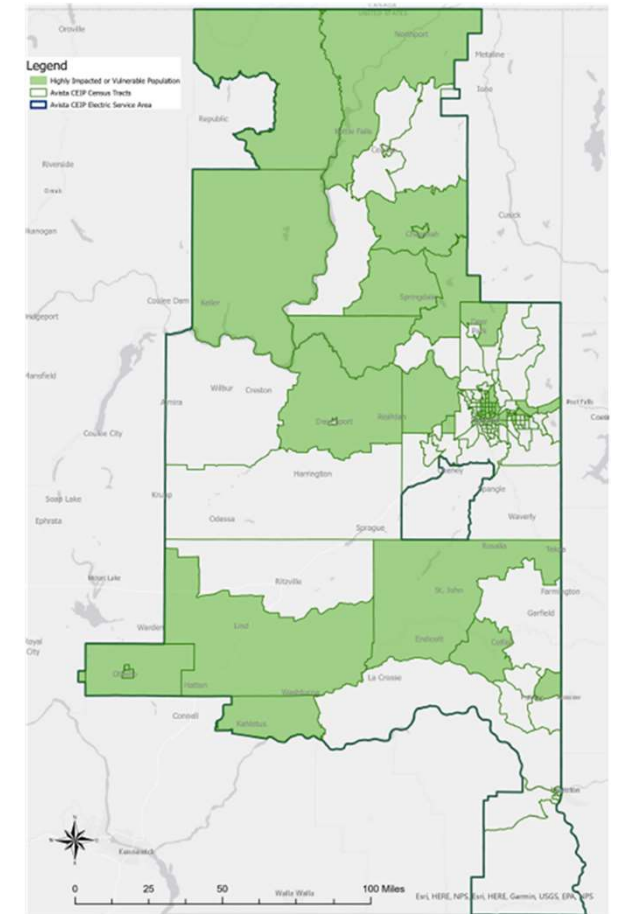
Additional Renewables may be required:

Hydrogen based fuel may require 800 to 2,000 MW of renewable capacity to create renewable fuel needed using a 20% round trip efficiency subject to further analysis

Named Community Investment Fund Projects

- Methodology
 - Spending constraints
 - \$2 million annually in low-income energy efficiency beyond cost effective programs
 - \$400k distributed energy resources (plus \$100k for program administration)
 - Takes advantage of state incentive funding

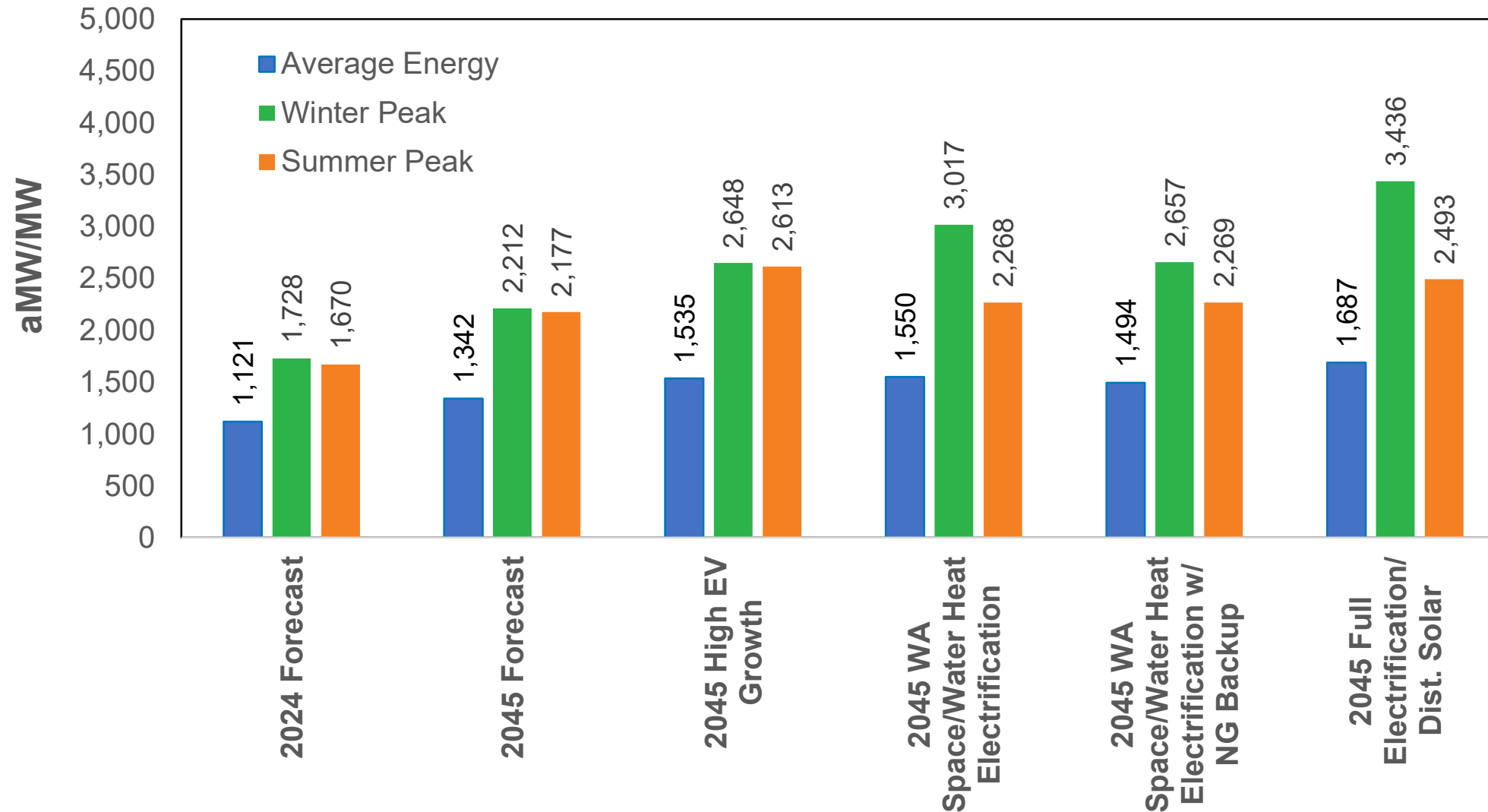
Program	Distribution Level Solar	Distribution Level Storage	Energy Efficiency
2024-2033	791 kW per year	Not selected	222 MWh per year
2034-2045	150 kW per year	193 kW (773 kWh) per year	2.2 MWh per year



Scenarios Highlights

- 16 alternative portfolio scenarios and 3 alternative market futures
- 6 portfolio covered changes in load forecasts
 - Electrification scenarios focus on vehicles, buildings, and combined implementation
 - Extreme electrification will lead to significant investment in T&D investment
- Resource Adequacy scenarios indicate energy storage choice will depend on how much qualify capacity credit (QCC) is given in the distant future
 - Lowering planning margins to current proposed WRAP value do not materially change portfolio due to monthly energy planning
- CETA's 100% requirements indicate additional cost exceeding social cost of carbon reduction
- Allocation of resources by jurisdiction creates a pathway for lowest cost strategy for each jurisdiction
- Maximum Customer Benefits scenario needs definition or stakeholder feedback to ensure it meets the intend of the rule

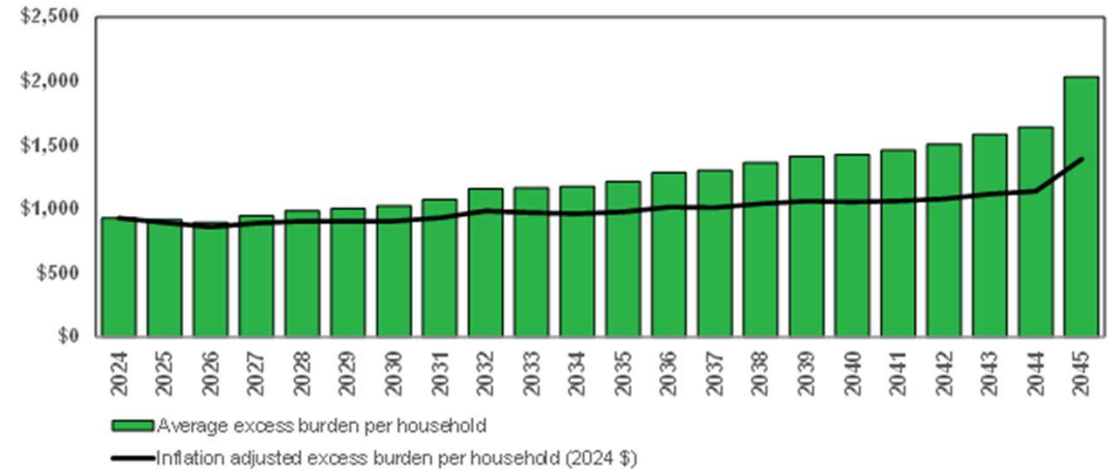
Electrification Scenarios



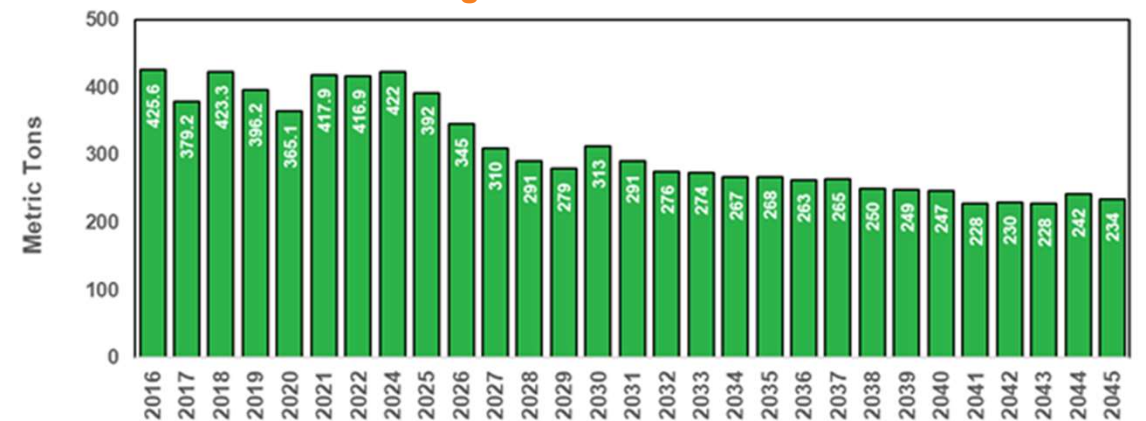
Customer Benefit Indicators

CBI	CBI Measurement Metrics
(1) Participation in Company Programs	Participation in weatherization programs and energy assistance programs (all customers and Named Communities)
	Saturation of energy assistance programs (all customers and Named Communities)
	Residential appliance and equipment rebates provided to customers residing in Named Communities and rental units (Condition No. 17)
(2) Number of households with a High Energy Burden (>6%)	Number and percent of households (known low income, all customers, Named Communities) (Condition No. 18)
	Average excess burden per household
(3) Availability of Methods/Modes of Outreach and Communication	Number of outreach contacts
	Number of marketing impressions
	Translation services (Condition No. 19)
(4) Transportation Electrification	Number of trips provided by Community Based Organizations (CBOs) for individuals utilizing electric transportation
	Number of annual passenger miles provided by CBOs for individuals utilizing electric transportation
	Number of public charging stations located in Named Communities
(5) Named Community Clean Energy	Total MWh of distributed energy resources 5 MW or less
	Total of MWh of energy storage resources under 5 MW
	Number of sites/projects of renewable distributed energy resources and energy storage resources
(6) Investments in Named Communities	Incremental spending each year in Named Communities
	Number of customers and/or CBOs served
	Quantification of energy/non-energy benefits from investments (if applicable)
(7) Energy Availability	Average outage duration
	Planning Reserve Margin (Resource Adequacy)
	Frequency of customer outages
(8) Energy Generation Location	Percent of generation located in Washington or connected to Avista transmission
(9) Outdoor Air Quality	Weighted average days exceeding healthy levels
	Avista plant air emissions
	Decreased wood use for home heating
(10) Greenhouse Gas (GHG) Emissions	Regional GHG emissions Avista GHG Emissions
(11) Employee Diversity	Employee diversity representative of communities served by 2035
(12) Supplier Diversity	Supplier Diversity of 11 percent by 2035
(13) Indoor Air Quality	In development
(14) Residential Arrearages and Disconnections for Nonpayment	Number and percent of residential electric disconnections for non-payment
	Residential arrearages as reported to Commission in Docket U-200281

#2 Average Washington Customer Excess Energy Burden



#9 Washington Facilities NOx Emissions



Challenges & Opportunities in Resource Planning

- **Generation & Fuel Technologies**
 - Existing commercially available technologies are not a fit for 2045 CETA targets nor natural gas decarbonization efforts
- **Transmission**
 - We need capacity for new resources and market access
 - Resource acquisition requirements do not align with the need to add transmission capacity to the system
- **Best practices for equity planning in an IRP**
 - Non Energy Impacts seems appropriate but expensive to determine
- **Alignment of State Policies**
 - CETA and CCA need coordinated market design
- **CETA objectives**
 - Determination of “use” for CETA is necessary to plan for 2030 electric compliance
- **Electrification**
 - Technology, consumer expectations, and costs are not in alignment in colder regions of Washington
- **Resource State Allocation**
 - Historical resource allocation methodology creates risk of under recovery of utility costs to comply with each state’s energy policies