2023 Electric Integrated Resource Plan

Technical Advisory Committee Meeting No. 8 Agenda

Wednesday, December 14, 2022
Microsoft Teams Virtual Meeting

Topic	Time	Staff
Introductions	9:00	John Lyons
Resource Acquisitions	9:05	Chris Drake
Placeholder Resource Strategy • Energy Efficiency • Demand Response • Resource Selection • Avoided Cost	9:40	James Gall
CBI Forecast	10:10	Mike Hermanson
Progress Report Outline	10:35	Lori Hermanson
Next Steps	10:50	James Gall
Adjourn	11:00	

IRP Introduction

2023 Avista Electric IRP

TAC 8 – December 14, 2022

John Lyons, Ph.D. Senior Resource Policy Analyst

Remaining 2023 Electric IRP TAC Meeting Schedule

- Virtual Public Meeting Gas & Electric IRPs: March 8, 2023 (12 to 1 pm and 5:30 to 6:30 pm PST)
- TAC 9: March 15, 2023 (9 am to 4 pm PST)

Other Important Dates

- Washington Progress Report – January 3, 2023
- External IRP draft released to TAC – March 31, 2023, public comments due – May 12, 2023
- Final 2023 IRP submission to Commissions and TAC – June 1, 2023

Today's Agenda

9:00	Introductions, John Lyons
9:05	Resource Acquisitions, Chris Drake
9:40	Placeholder Resource Strategy, James Gall

- Energy Efficiency
- Demand Response
- Resource Selection
- Avoided Cost

10:10	CBI Forecast, Mike Hermanson
10:35	Progress Report Outline, Lori Hermanson
10:50	Next Steps, James Gall
11:00	Adjourn

DRAFT

2022 RFP Resource Acquisitions

Chris Drake, Manager of Resource Optimization and Marketing
Technical Advisory Committee Meeting No. 8
December 14, 2022

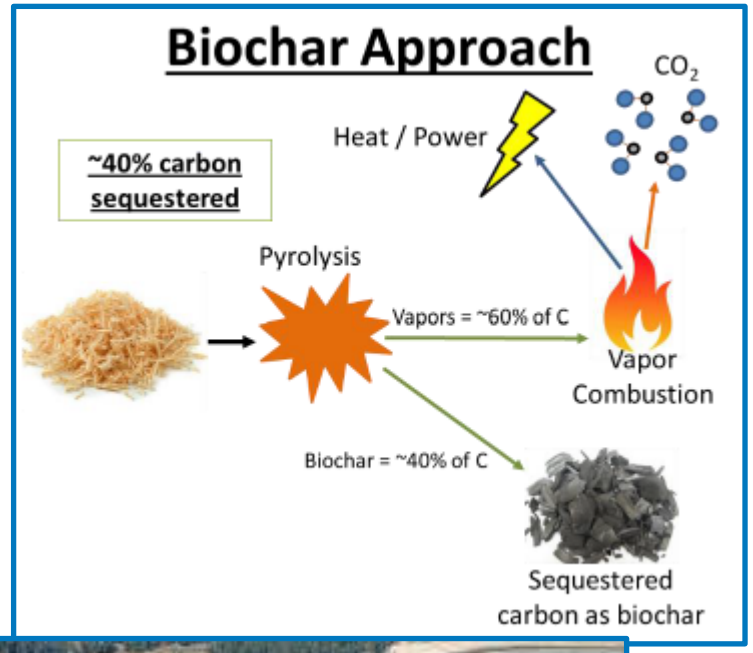
Avista's Kettle Falls Biomass upgrade

Capacity, Energy, Financial

- 11 MW net capacity increase
- 18 MW from 3rd party steam
- ~$50 Levelized Cost of Energy over 20 years
- $11.2 million incremental capital into KF

Environmental, Community

- ~100,000 CO_2e sequestered annually
- ~30% reduction in annual NO_X emissions, CO, and VOCs intensity
- Delay or eliminate need for ash disposal landfill (~$10 million savings)
- Anticipated 15 new FTEs from biochar/steam contractor



Columbia Basin Hydropower

Irrigation Hydro

- 23-year supply deal in total
- Projects ramping in between 2023 and 2030
- 100% of the output from 7 hydro projects throughout central Washington (3 BPA, 2 Grant, 2 Avista BAs)
- Approximately 145 MW of max generation.
- March–October generation shaped like solar generation with no hourly variability (and includes off-peak energy)

Facilities

- Main Canal Headworks
- Summer Falls
- Russell D. Smith
- Eltopia Branch Canal (EBC)
- Potholes East Canal (PEC)
- Potholes East Headworks (PEC Headworks)
- Quincy Chute

AVISTA

2023 Placeholder Resource Strategy

James Gall, Manager of Integrated Resource Planning
Technical Advisory Committee Meeting No. 8
December 14, 2022

Safe Harbor Statement

This document contains forward-looking statements. Such statements are subject to a variety of risks, uncertainties and other factors, most of which are beyond the Company's control, and many of which could have a significant impact on the Company's operations, results of operations and financial condition, and could cause actual results to differ materially from those anticipated.

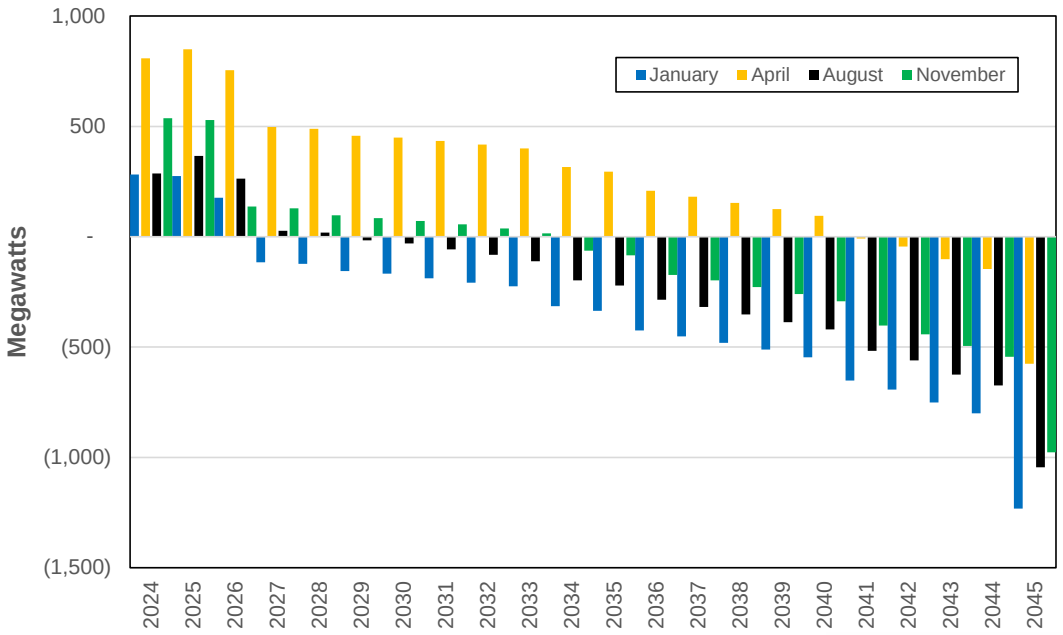
For a further discussion of these factors and other important factors, please refer to the Company's reports filed with the Securities and Exchange Commission. The forward-looking statements contained in this document speak only as of the date hereof. The Company undertakes no obligation to update any forward-looking statement or statements to reflect events or circumstances that occur after the date on which such statement is made or to reflect the occurrence of unanticipated events. New risks, uncertainties and other factors emerge from time to time, and it is not possible for management to predict all of such factors, nor can it assess the impact of each such factor on the Company's business or the extent to which any such factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statement.

Other Caveats

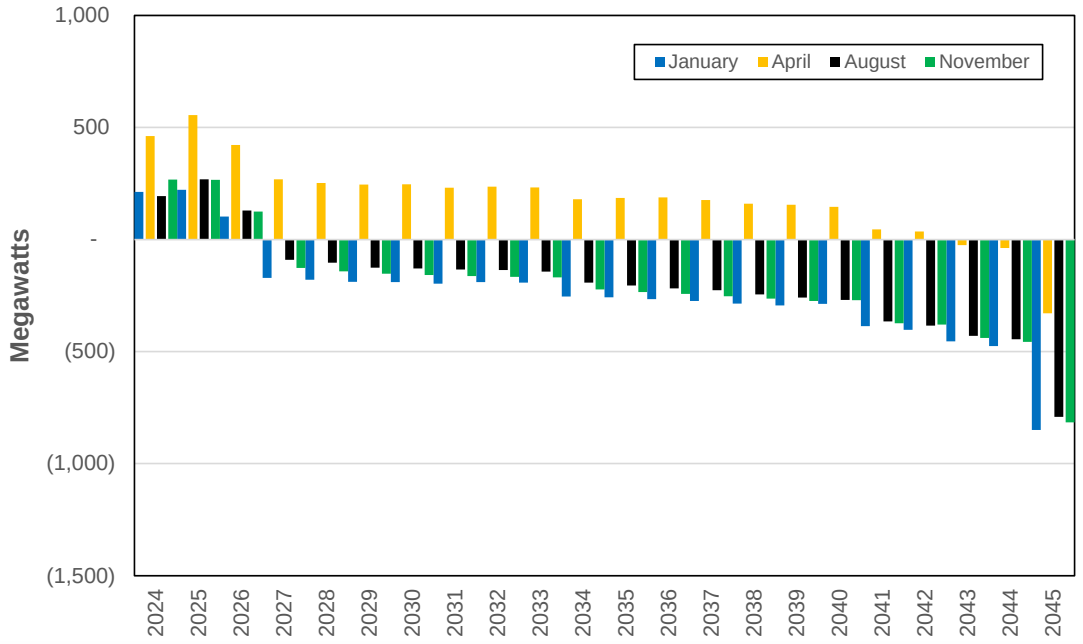
- **Avista is negotiating with 2022 All-Source Request for Proposals (RFP) shortlist bidders. The Placeholder Resource Strategy will significantly change to include new resources after RFP negotiations conclude. Changes will be reflected in the June 2023 IRP Filing.**
- IRP resource options are primarily “new” resource options - RFP will determine if existing resources can be acquired at similar or lower cost than the assumed IRP options.
- Not all resources within an IRP option list are bid into RFPs, also costs are based on Bidder’s pricing not generic estimates used in IRPs.
- Avista may not be able to physically retire or exit certain resources as the IRP PRiSM model determines because of contract limitations.
- No future state specific resource cost allocation agreement has been made.
- Forward looking rates include non-modeled power supply cost escalating at 3.8% per year-
  - **THIS IS NOT A RATE FORECAST**
  - This is for informational purposes only

Resource Needs Begin November 2026

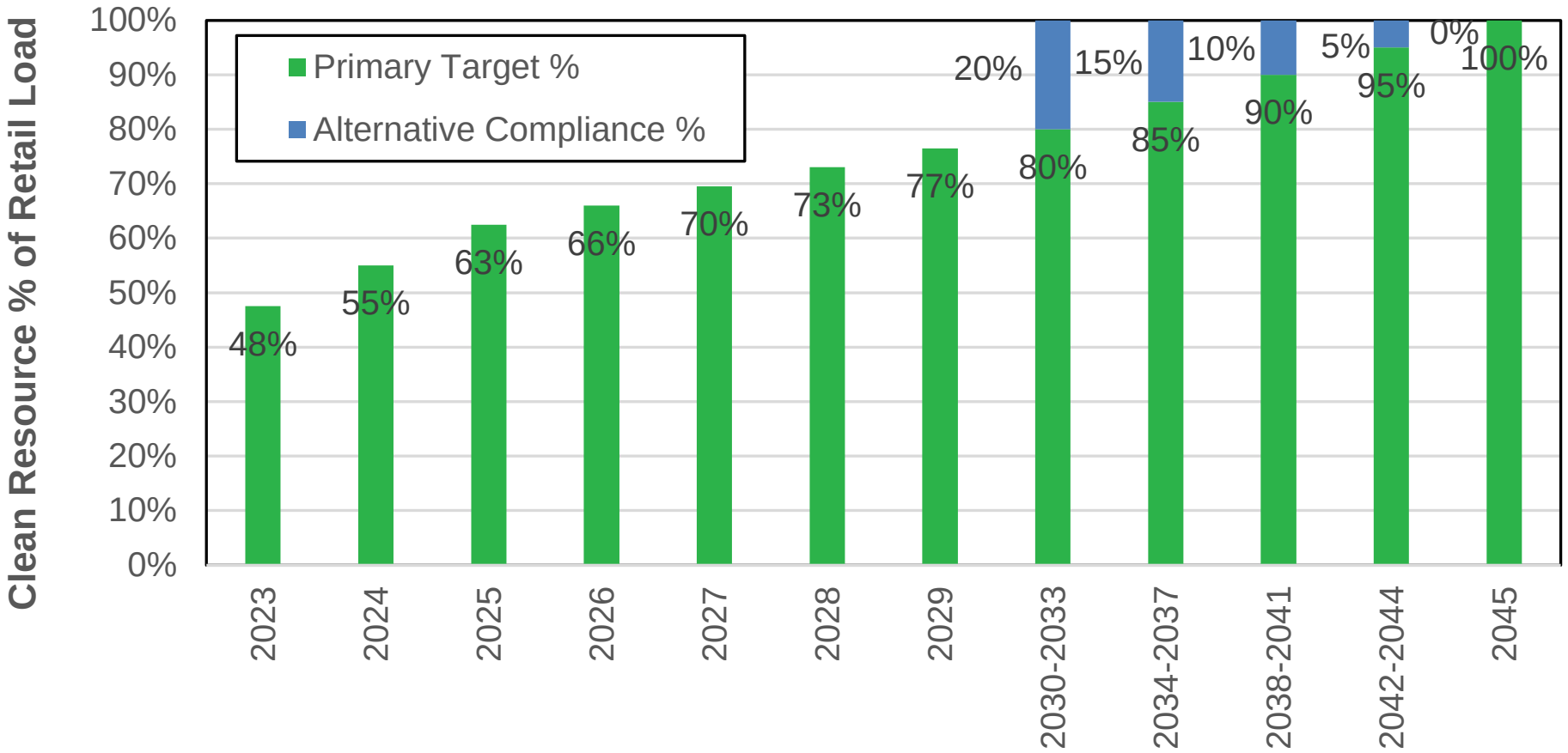
Capacity Needs



Energy Needs



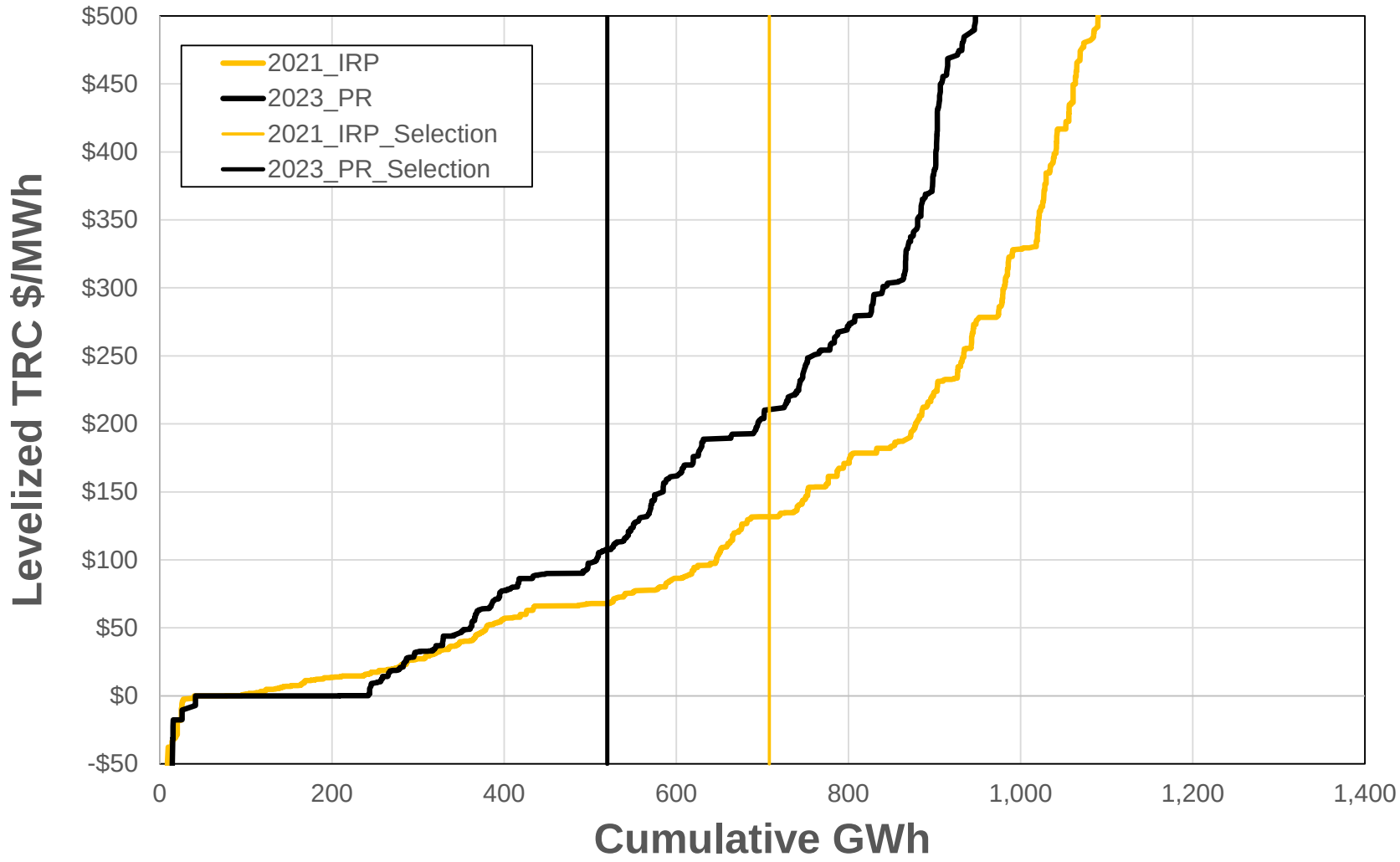
CETA Renewable Energy Goal



Named Community Investment Fund Projects

- Methodology
  - Spending constraints
    - $2 million annually in low-income energy efficiency beyond cost effective programs.
    - $500k distributed energy resources ($100k for program administration).
  - Results
    - 2.4 GWh additional EE though 2033 (0.7 percent increase).
    - 700 kW annual Low Income Community additions 2024 through 2033 with funding from state low-income community solar funding.
    - After 2034, 100 to 200 kW solar programs w/ storage.
    - Additional programs from the remaining funding will be included as projects are known.
      - (if they have an effect on power supply needs)

2024-2045 Cumulative Energy Efficiency Supply Curve Washington Jurisdiction Comparison between 2021 IRP



Cumulative Energy Efficiency End Use Results (GWh)

	Washington			Idaho		
End Use	**2024**	**2033**	**2045**	**2024**	**2033**	**2045**
Appliances	0.5	6.2	8.2	0.2	1.5	1.9
Electronics	0.2	6.4	13.3	0.1	3.0	6.3
Exterior Lighting	6.0	77.5	164.3	3.1	40.1	83.0
Food Preparation	0.1	2.6	11.2	0.0	0.0	0.0
Interior Lighting	0.2	1.4	1.7	0.1	1.9	2.0
Miscellaneous	2.2	24.2	36.7	1.1	11.9	17.9
Motors	3.9	59.5	60.2	0.0	0.3	0.4
Office Equipment	0.1	6.9	14.6	0.0	1.5	2.7
Process	1.4	18.8	22.0	1.1	14.3	16.1
Refrigeration	2.6	17.7	19.0	1.9	19.7	21.1
Ventilation	0.4	4.6	7.0	0.2	2.1	3.1
Water Heating	1.3	16.8	25.5	0.9	10.2	16.5
Space Heating/Cooling	5.1	80.8	115.7	0.9	19.6	33.2
Total	**24.1**	**323.3**	**499.3**	**9.6**	**125.8**	**204.2**
2021 IRP equivelent	**41.8**	**526.3**	**708.0**	**13.2**	**138.6**	**202.2**

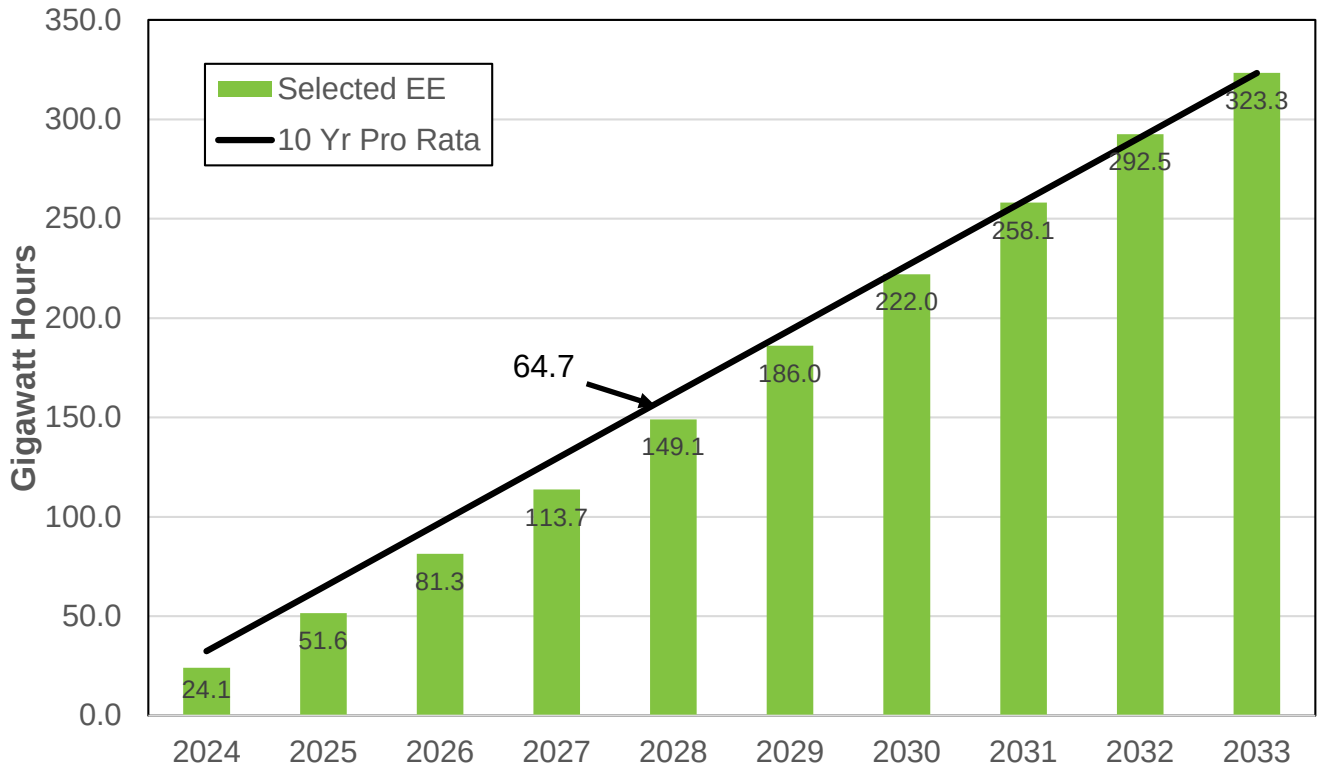
Cumulative Energy Efficiency Segment Results (GWh)

	Washington			Idaho		
Segment	**2024**	**2033**	**2045**	**2024**	**2033**	**2045**
College	0.7	7.5	12.2	0.4	3.7	5.7
Grocery	1.1	15.2	23.9	1.2	16.9	26.3
Health	0.6	5.3	7.4	0.0	0.4	0.6
Industrial	2.5	32.5	48.5	2.0	25.3	35.3
Large Office	0.7	7.2	12.1	0.6	5.8	9.8
LI - Mobile Home	0.3	5.0	8.4	-	-	-
LI - Multi-Family	0.9	14.1	21.0	-	-	-
LI - Single Family	4.9	69.1	79.4	-	-	-
Lodging	1.1	8.9	14.2	0.5	5.0	6.8
Miscellaneous	1.4	16.1	30.6	1.2	16.2	29.3
Mobile Home	0.1	3.9	8.5	-	-	-
Multi-Family	0.0	1.6	2.7	-	-	-
Pumping	0.6	8.2	10.4	0.4	5.2	6.1
Restaurant	1.1	14.6	21.9	0.7	9.1	13.6
Retail	2.6	28.1	49.5	1.6	19.2	30.7
School	1.1	14.9	28.2	0.1	0.9	1.7
Single Family	1.8	37.7	57.7	0.3	11.0	25.5
Small Office	1.2	16.7	32.2	0.3	3.2	6.2
Warehouse	1.4	16.9	30.5	0.3	4.0	6.5
Total	24.1	323.3	499.3	9.6	125.8	204.2

Lower Washington Energy Efficiency Goals

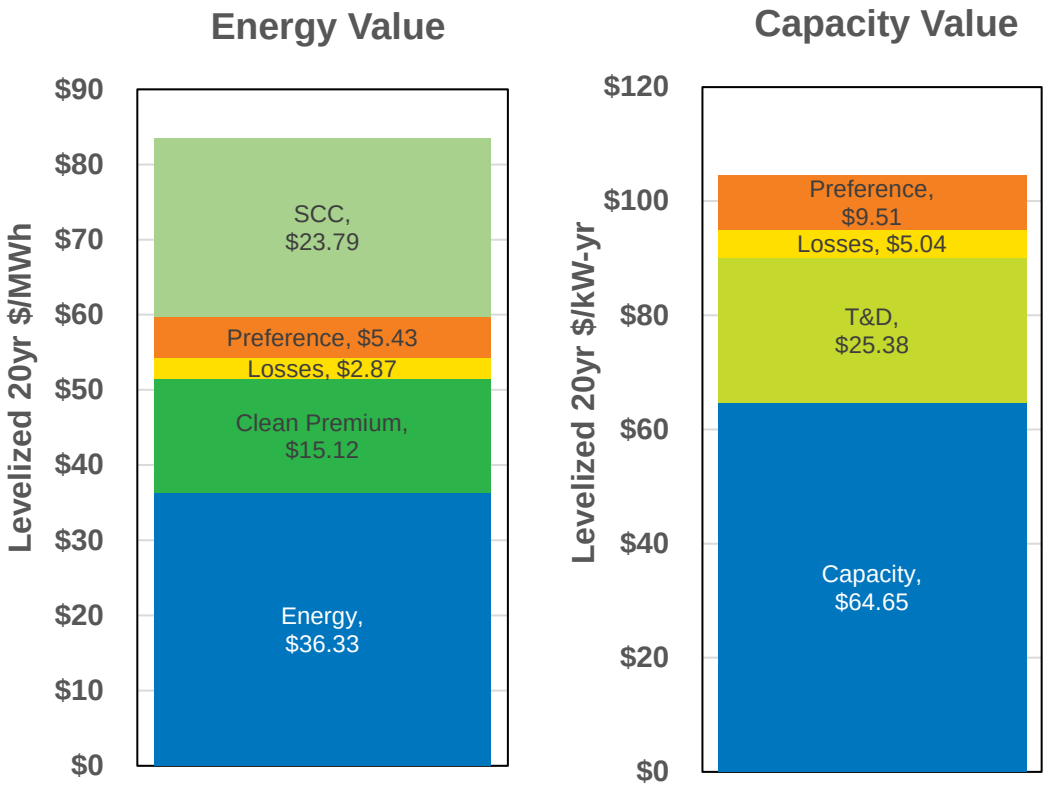
Lower Avoided Costs & Lower Potential

2024-2025 Biennial Conservation Target (MWh)	
CPA Pro-Rata Share	64,667
EIA Target	64,667
Decoupling Threshold	3,233
Total Utility Conservation Goal	67,900
Excluded Programs (NEEA)	-10,162
Utility Specific Conservation Goal	57,739
Decoupling Threshold	-3,233
EIA Penalty Threshold	54,505

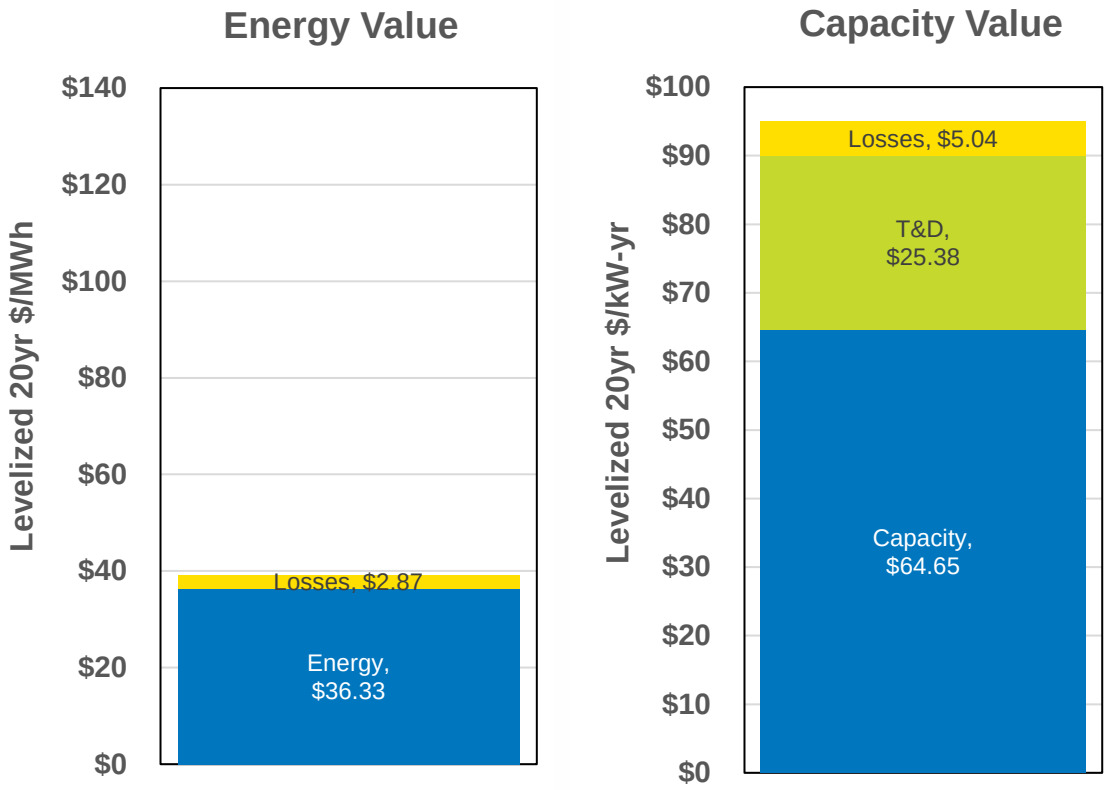


24-yr Levelized Avoided Cost for Energy Efficiency

Washington



Idaho



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 Progress Report Results
  - 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.

"Placeholder" PRS Selection (MW)

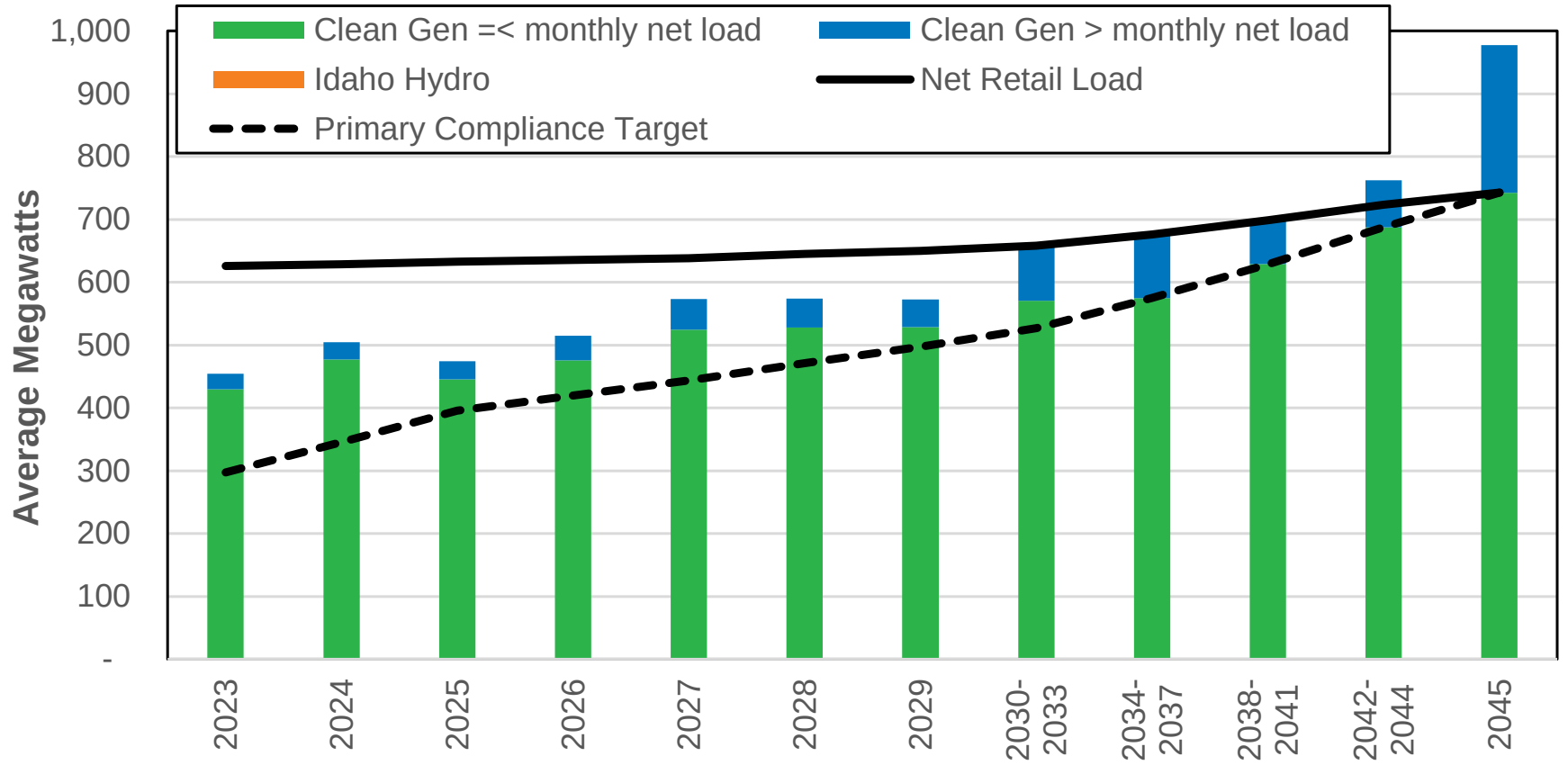
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2024-2033	2034-2045
Washington																								
Demand Response	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7	0
Natural Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	3
Baseload Renewable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20	20
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
NW Wind	0.0	0.0	0.0	0.0	0.0	0.0	150.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	140.0	105.0	0.0	137.2	508.4	150	891
Montana Wind	0.0	0.0	0.0	125.1	0.0	0.0	0.0	0.0	174.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	300	0
Off Shore Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Distributed Solar/ wStorage	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	7	2
Utility Scale Solar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Short Duration Storage (<8hr)	0.0	0.0	0.0	25.0	0.0	35.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	51.5	0.0	0.0	0.0	25.0	0.0	61	76
Medium Duration Storage (8-24hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Long Duration Storage (>24hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	147.4	0.0	0.0	0.0	0.0	0.0	59.8	0.0	0.0	75.8	0.0	68.0	0.0	318.8	147	522
Total	**0.7**	**7.4**	**0.7**	**150.8**	**0.7**	**36.4**	**150.7**	**20.7**	**323.1**	**0.8**	**0.2**	**0.2**	**3.5**	**0.2**	**60.0**	**0.2**	**51.7**	**216.0**	**105.2**	**68.2**	**162.4**	**847.4**	**692**	**1,515**
Idaho																								
Demand Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Natural Gas	0.0	0.0	0.0	186.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	186	2
Baseload Renewable	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Nuclear	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
NW Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Montana Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Off Shore Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Distributed Solar/ wStorage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Utility Scale Solar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Short Duration Storage (<8hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.8	0.0	0.0	0.0	0	38
Medium Duration Storage (8-24hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0
Long Duration Storage (>24hr)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	31.3	0.0	0.0	39.7	0.0	35.6	0.0	79.0	0	185
Total	**0.0**	**0.0**	**0.0**	**186.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.7**	**0.0**	**31.3**	**0.0**	**0.0**	**39.7**	**37.8**	**35.6**	**0.0**	**79.0**	**186**	**225**

Used for Energy Efficiency Potential Study Only- Will change after all RFP resources are added.

Transmission Needs

- Most generation selection is off-system or up to interconnection limits before major transmission upgrades needed.
- 2045 renewable & long-duration storage requirements will require significant build outs in Big-Bend and Rathdrum areas.
- Earlier construction may be necessary if low-cost interconnection resources are purchased by other utilities.

Washington CETA Clean Energy Comparison (aMW)



CETA Cost Cap Analysis

- Cost cap compares utility's strategy to an "Alternative Least Reasonable Cost Portfolio"
  - How do we define this portfolio?
  - When does "alternative" begin?
    - For example, should this portfolio exclude past decisions to acquire resources used to comply with CETA?
      - Without excluding these resources, the incremental cost will be too low over time as base cost will include higher priced resources.
    - Do we need to maintain a resource portfolio over time with "theorical" resources we would have acquired?
  - Should Preferred Resource Strategy reflect changes if cost cap is reached?

CETA Cost Cap Analysis Example

- Assumes No Columbia Basin Hydro. (Chelan PUD #2/#3 can be added for final IRP)
- Assumes CS2 available in 2045.
- Assumes no CETA compliance requirements.
- Includes Social Cost of Greenhouse Gas.
- **Cost cap reached in final compliance period.**

	2026-2029	2030-2033	2034-2037	2038-2041	2042-2045
Cost Cap Spending Limit	$136m	$159m	$183m	$210m	$244m
PRS w NCF spending	$10m	$40m	$51m	$43m	$212m
Delta	$125m	$118m	$133m	$167m	$31m

CBI Forecast

Mike Hermanson, Senior Power Supply Analyst
Electric IRP, 8th Technical Advisory Committee Meeting
December 14, 2022

Background

- Customer Benefit Indicators (CBIs) are required to ensure equitable distribution of energy and non-energy benefits and reductions of burdens to highly impacted communities and vulnerable populations.

Who?	Benefits					
Highly impacted communities and vulnerable populations	Energy Benefits		Non-Energy Benefits		Reduction of Burdens	
All Customers, including highly impacted communities and vulnerable populations	Public Health	Environment	Cost Reduction	Risk Reduction	Energy Security	Resiliency

Background

- CEIP includes 14 CBIs:

1. Participation in Company Programs	**8. Energy Generation Location**
2. Number of households with a High Energy Burden (>6%)	**9. Outdoor Air Quality**
3. Availability of Methods/Modes of Outreach and Communication	**10. Greenhouse Gas Emissions**
4. Transportation Electrification	11. Employee Diversity
5. Named Community Clean Energy	12. Supplier Diversity
6. Investments in Named Communities	13. Indoor Air Quality
7. Energy Availability	14. Residential Arrearages and Disconnections for Nonpayment

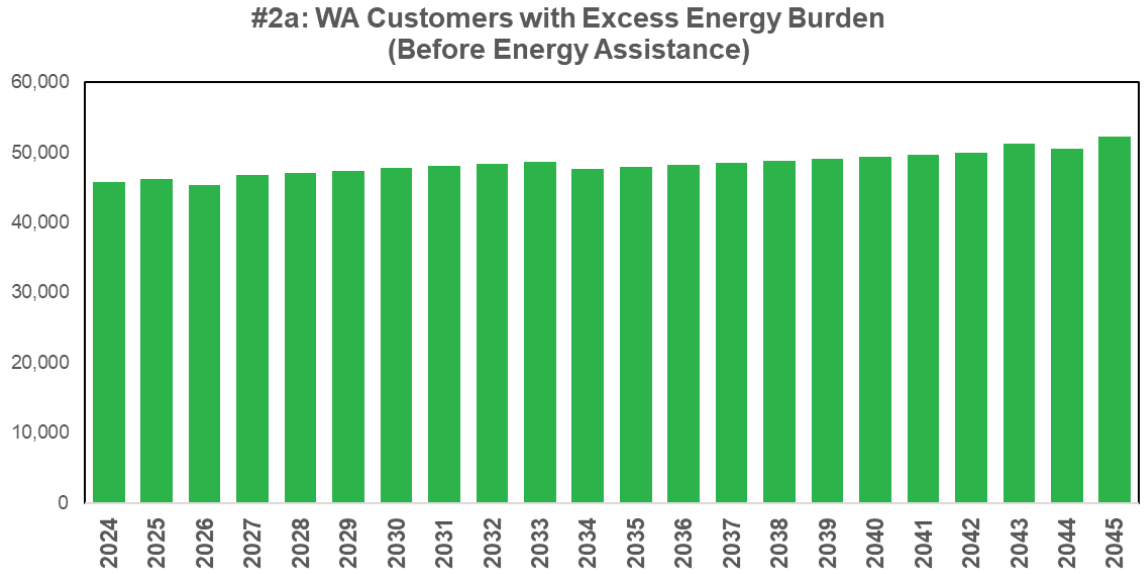
- 7 CBIs forecasted in IRP modeling.

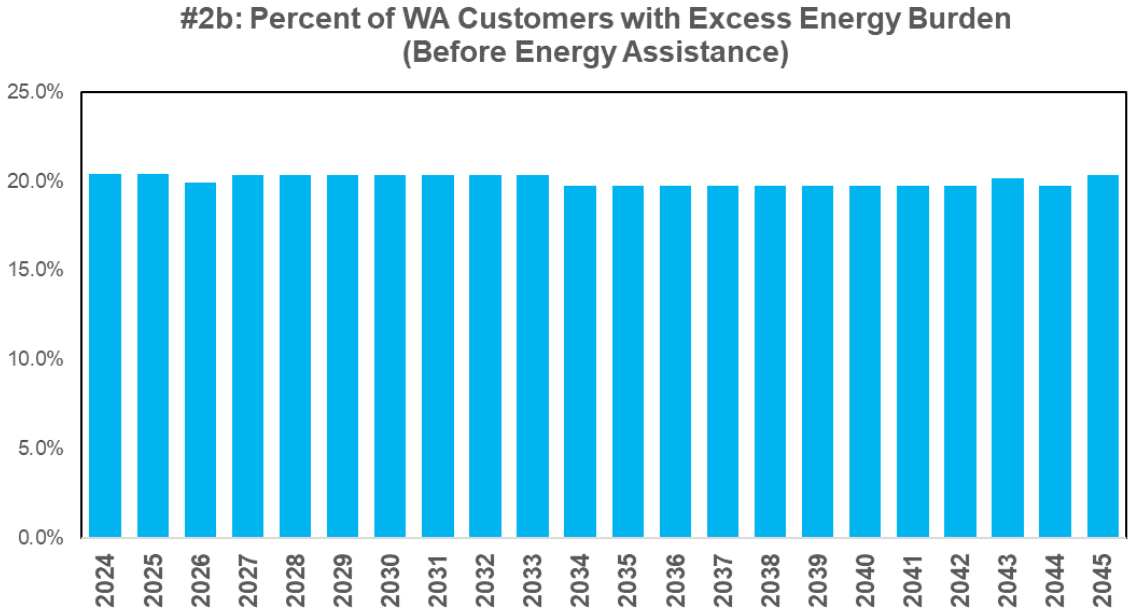
Number of households with a High Energy Burden (>6%)

- High energy burden is annual energy cost (electric & gas) greater than 6% of annual income.
- Forecasted by:

(PRS rates x annual energy usage)/annual income

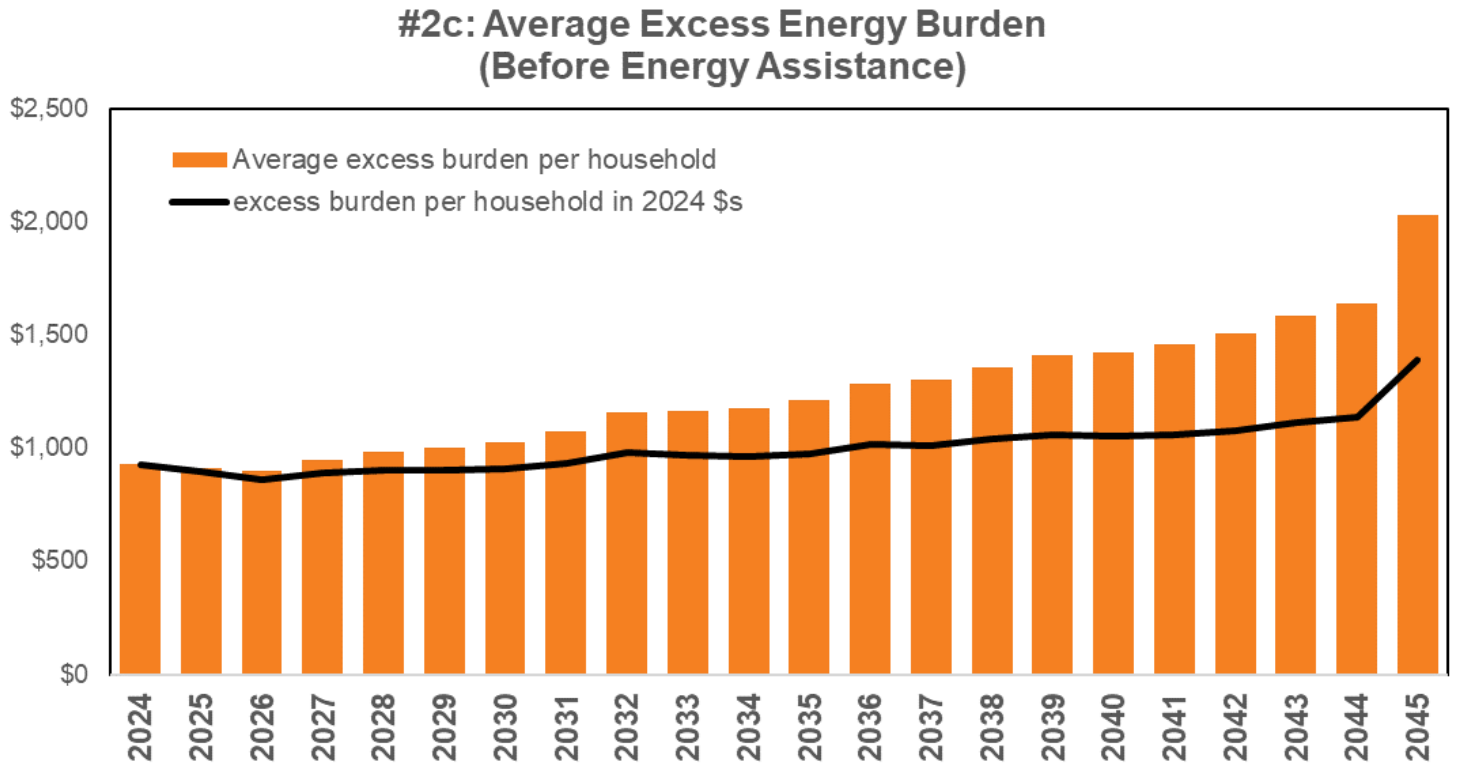
- Forecast includes:
  - Reductions in energy usage from low-income energy efficiency programs selected by PRiSM.
  - Historic income increases for specific income groups projected forward.





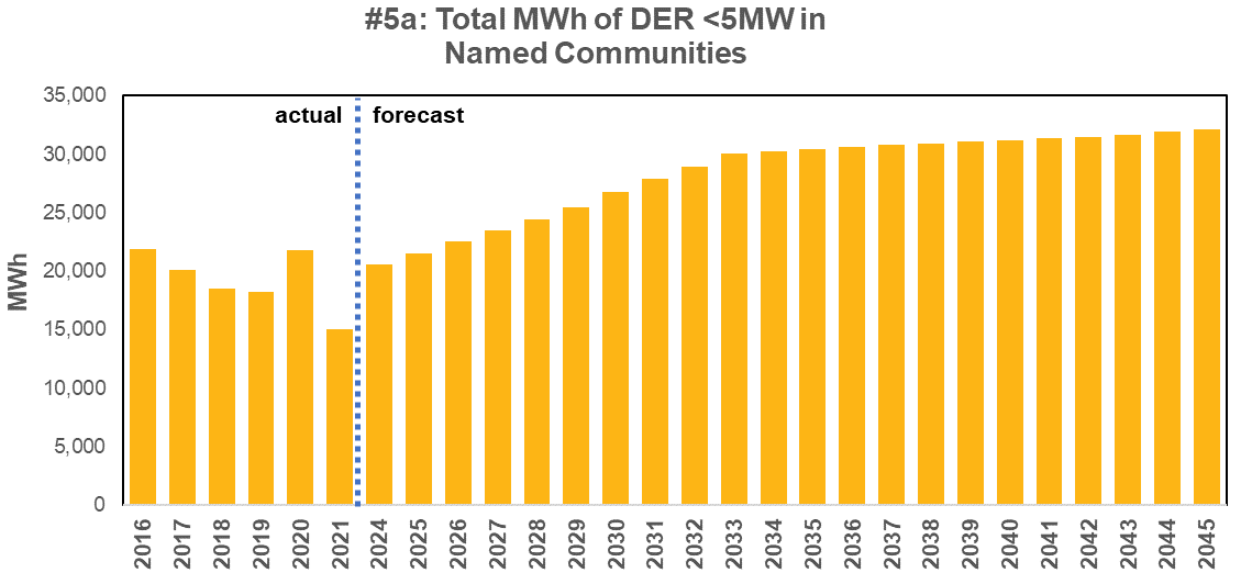
Number of households with a High Energy Burden (>6%)

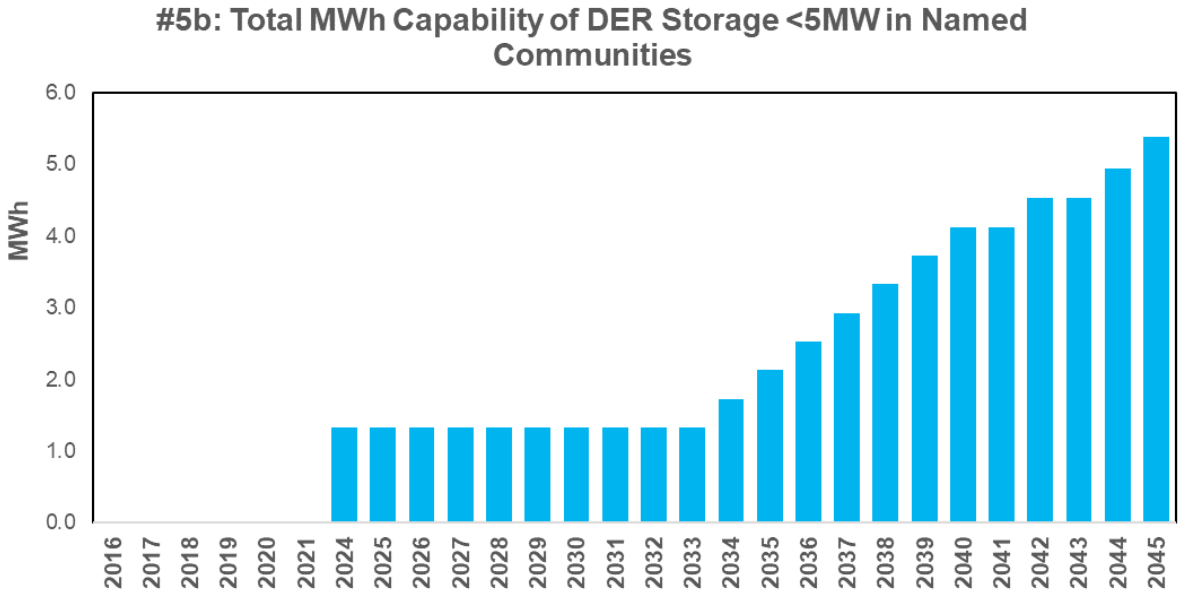
- Excess energy burden amount in excess of 6% of annual income.



Named Community Clean Energy

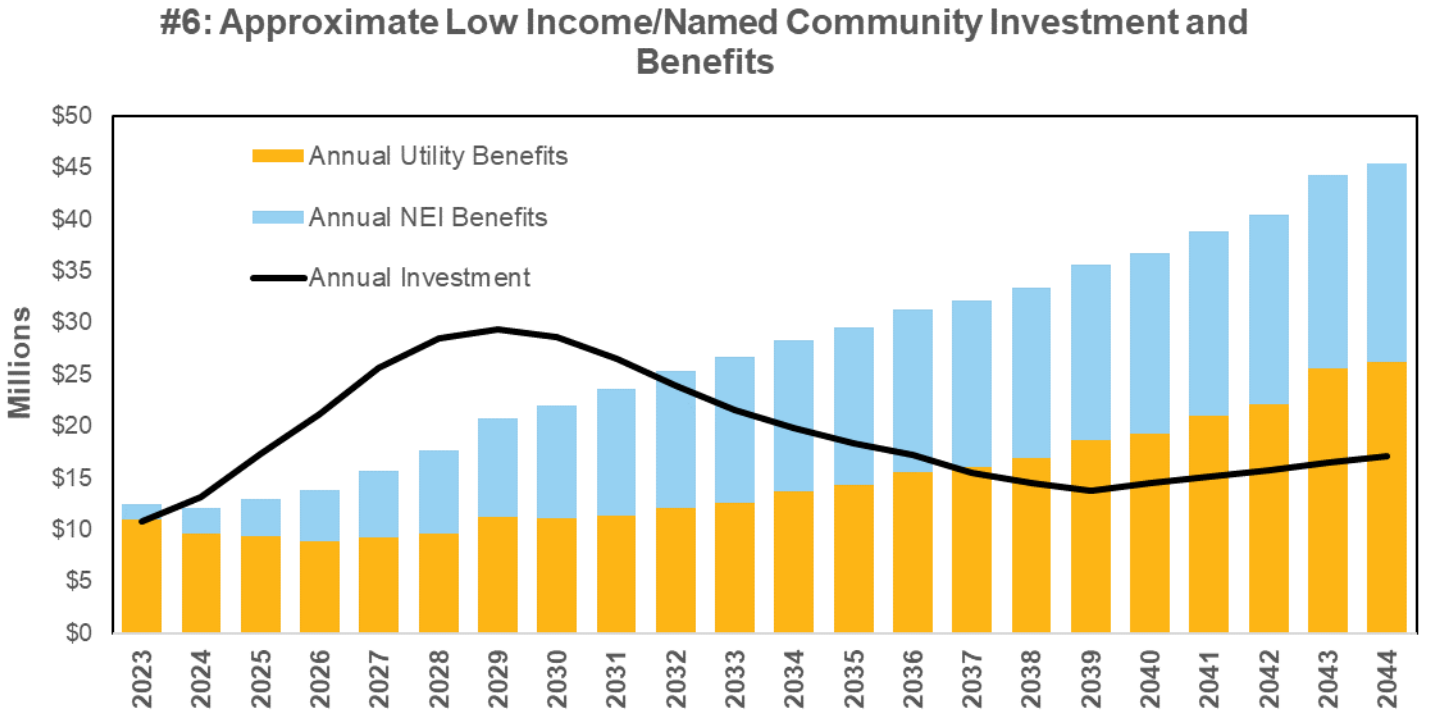
- DER generation includes:
  - PURPA generation in named communities
  - Community solar
  - Customer net metering
- Community solar selected between 2024 – 2033 supported by tax incentives.
- Community solar with battery storage selected after 2034.





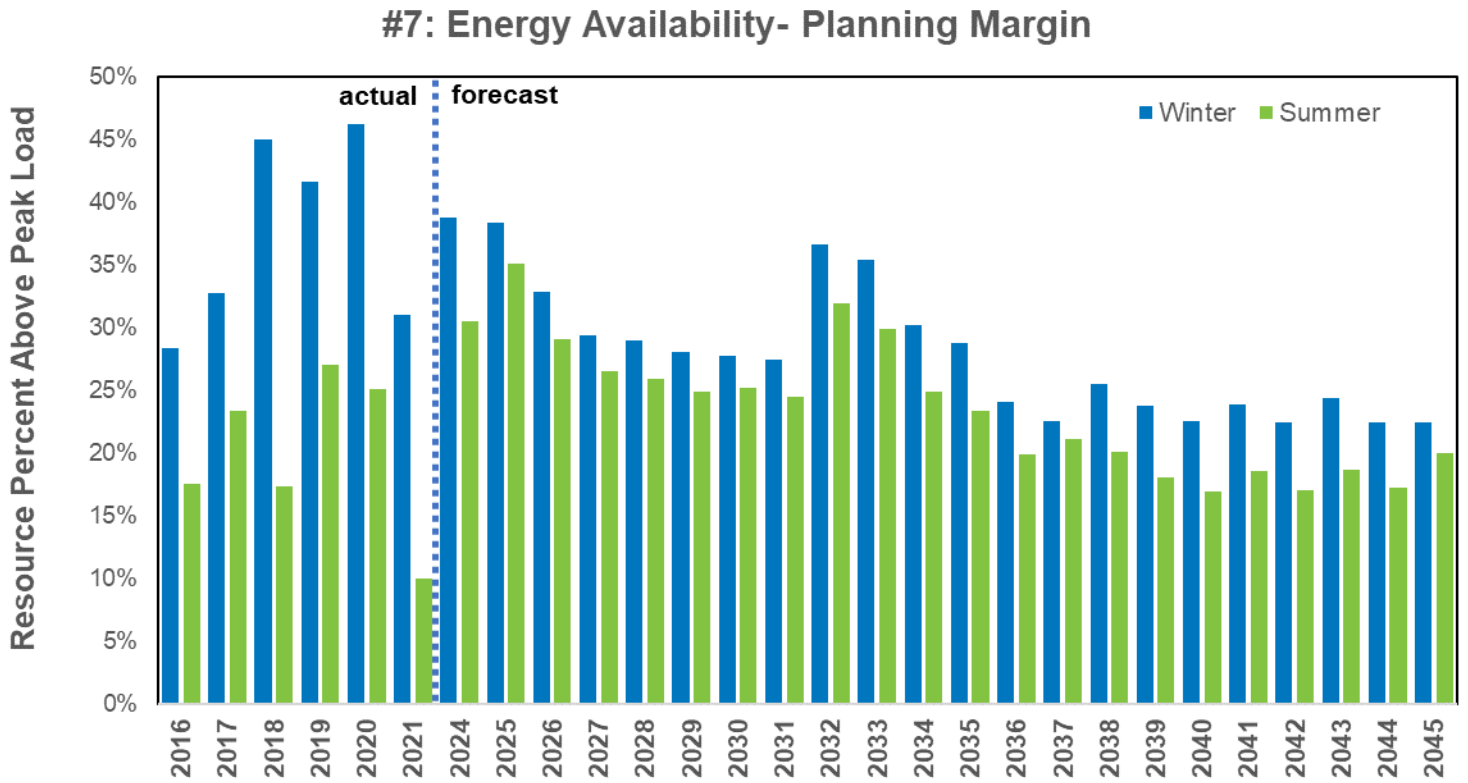
Investments in Named Communities

- Includes low-income EE investment and likely named community demand response investment.
- Annual NEI and utility benefit is the market value or established NEI unit rate of energy associated with EE and named community demand response.
- Investment declines as EE opportunities decline over the planning horizon.



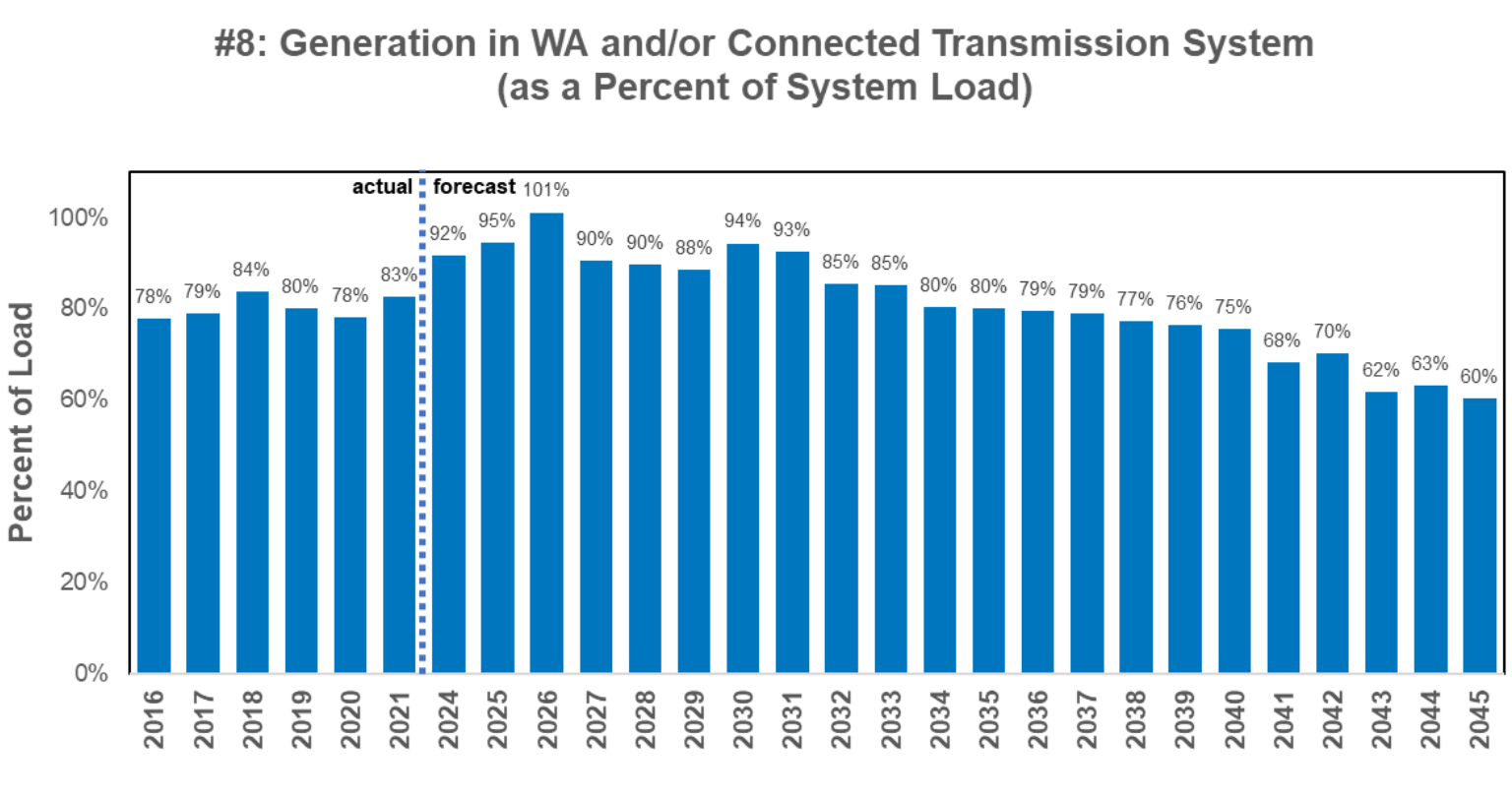
Energy Availability

- Energy availability is related to energy resiliency.
- Planning margins:
  - Winter – 22%
  - Summer – 13%
- Energy needs drive selection so resources exceed the planning margin.
- After resource additions planning margin decreases but does not reach target.



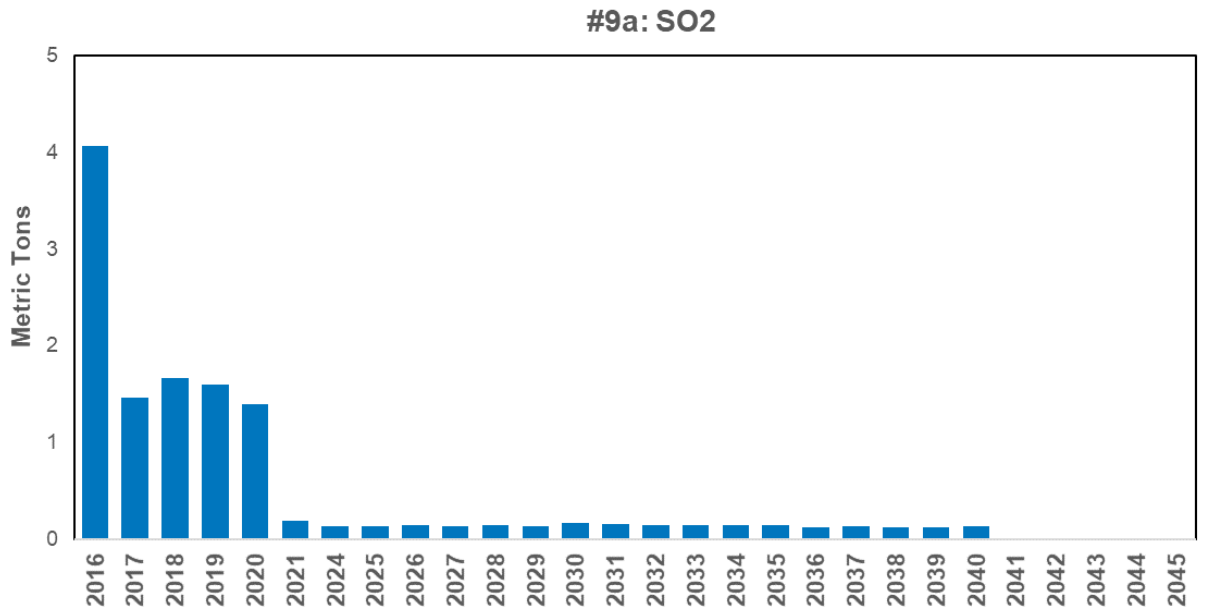
Energy Generation Location

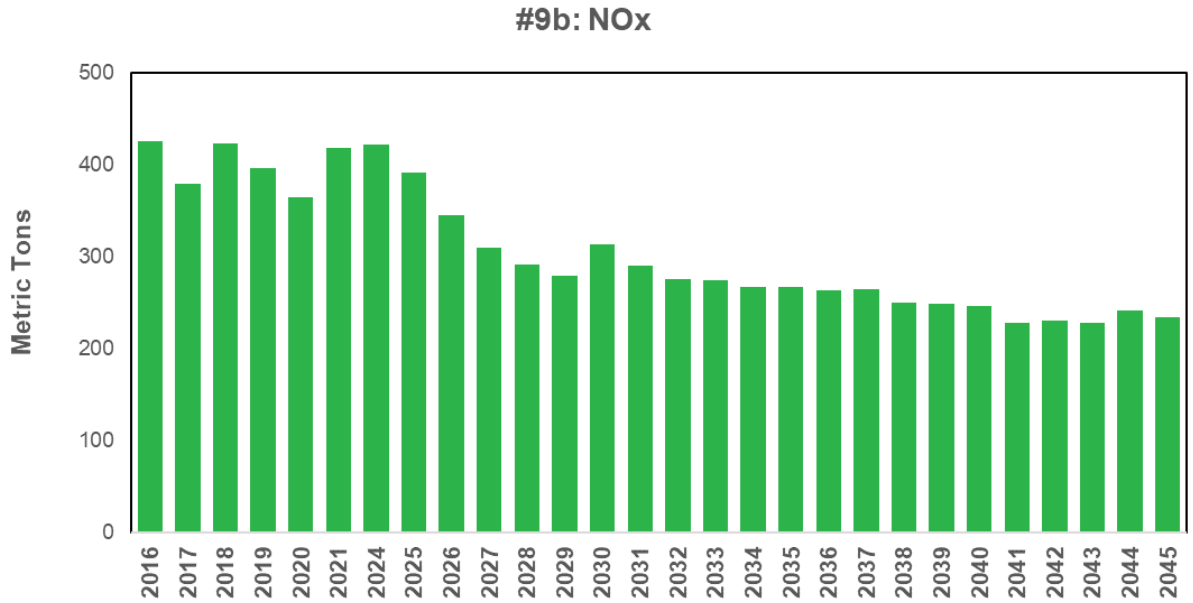
- Energy generation location and connectivity is related to customer energy security.
- As a % of load, WA located and/or connected to Avista transmission system decreases as more off system wind generation is added over the planning horizon.



Outdoor Air Quality

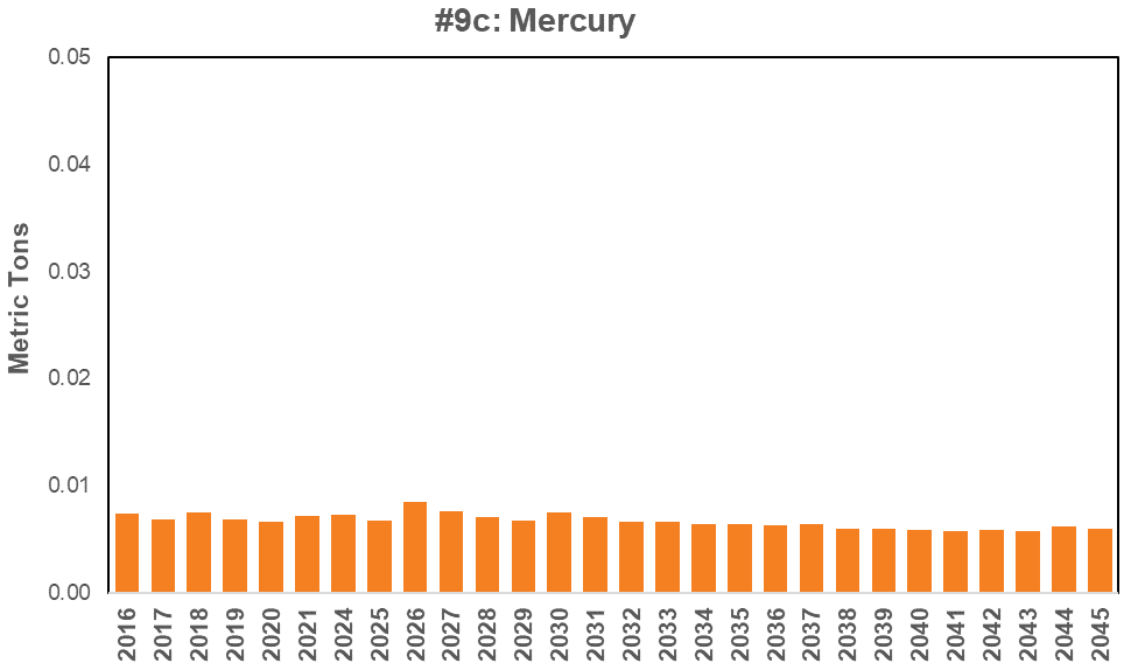
- Emissions related to thermal generation located in WA.
- SO_2 results related to non-detect field measurements. In the process of confirming results.
- NOx emissions reduce over time as a result of decreased emission rates from Kettle Falls upgrade and decreased dispatch of Kettle Falls.

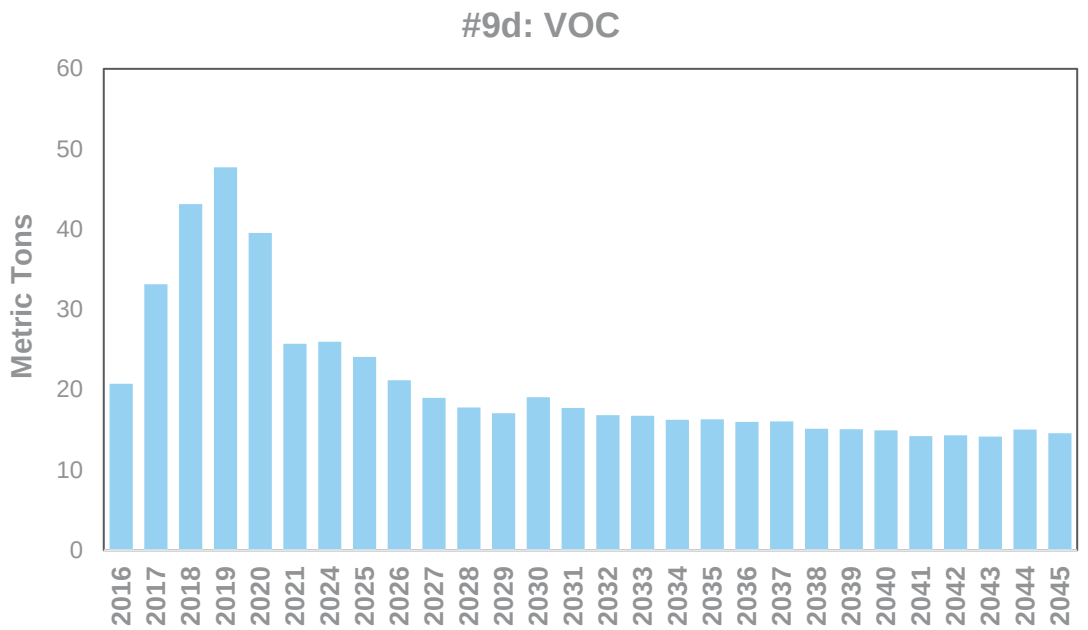




Outdoor Air Quality

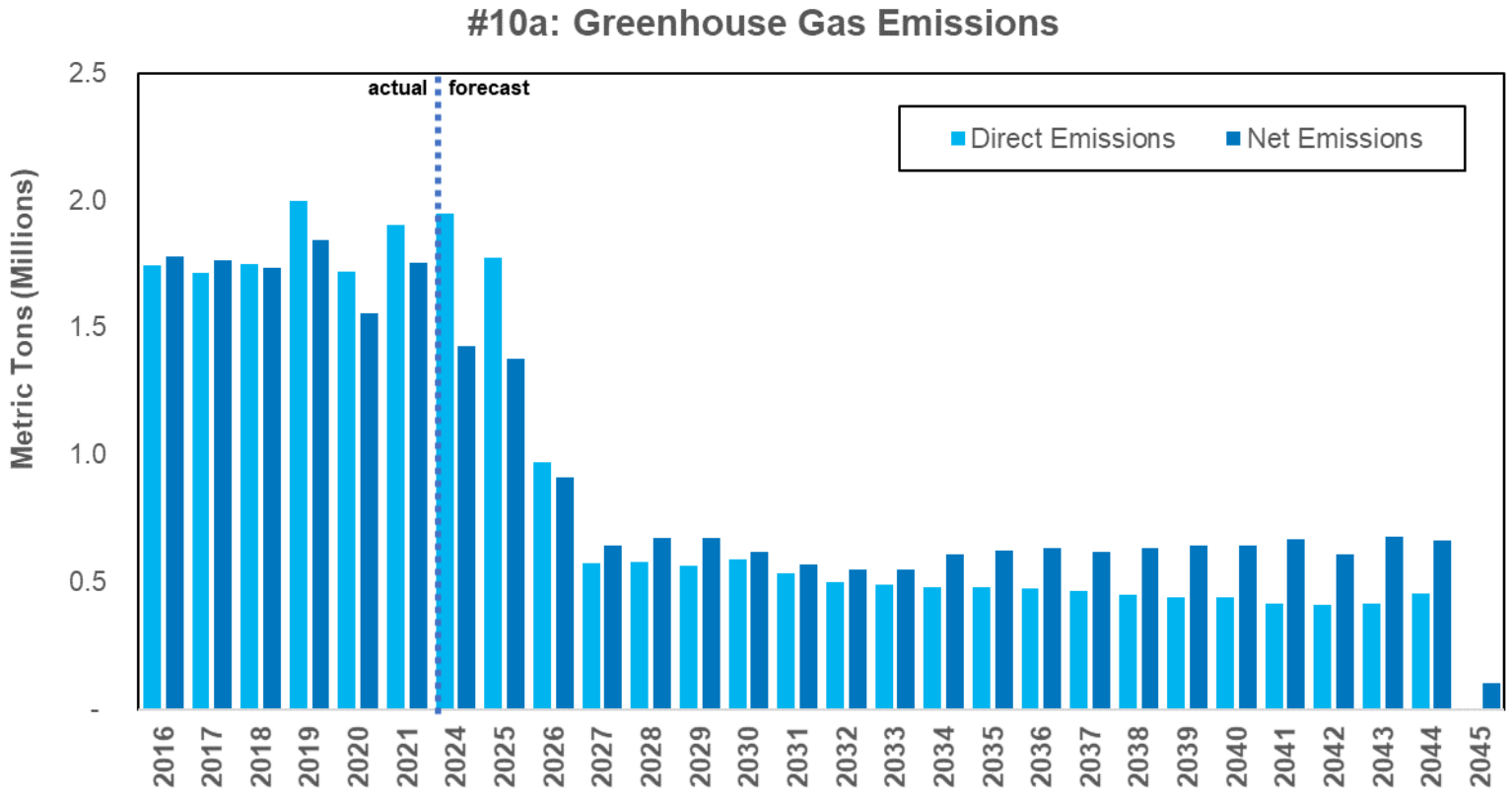
- Emissions related to thermal generation located in WA.
- Small reduction in Mercury emissions.
- VOC emissions reduce over time as a result of decreased emission rates from Kettle Falls upgrade and decreased dispatch of Kettle Falls.





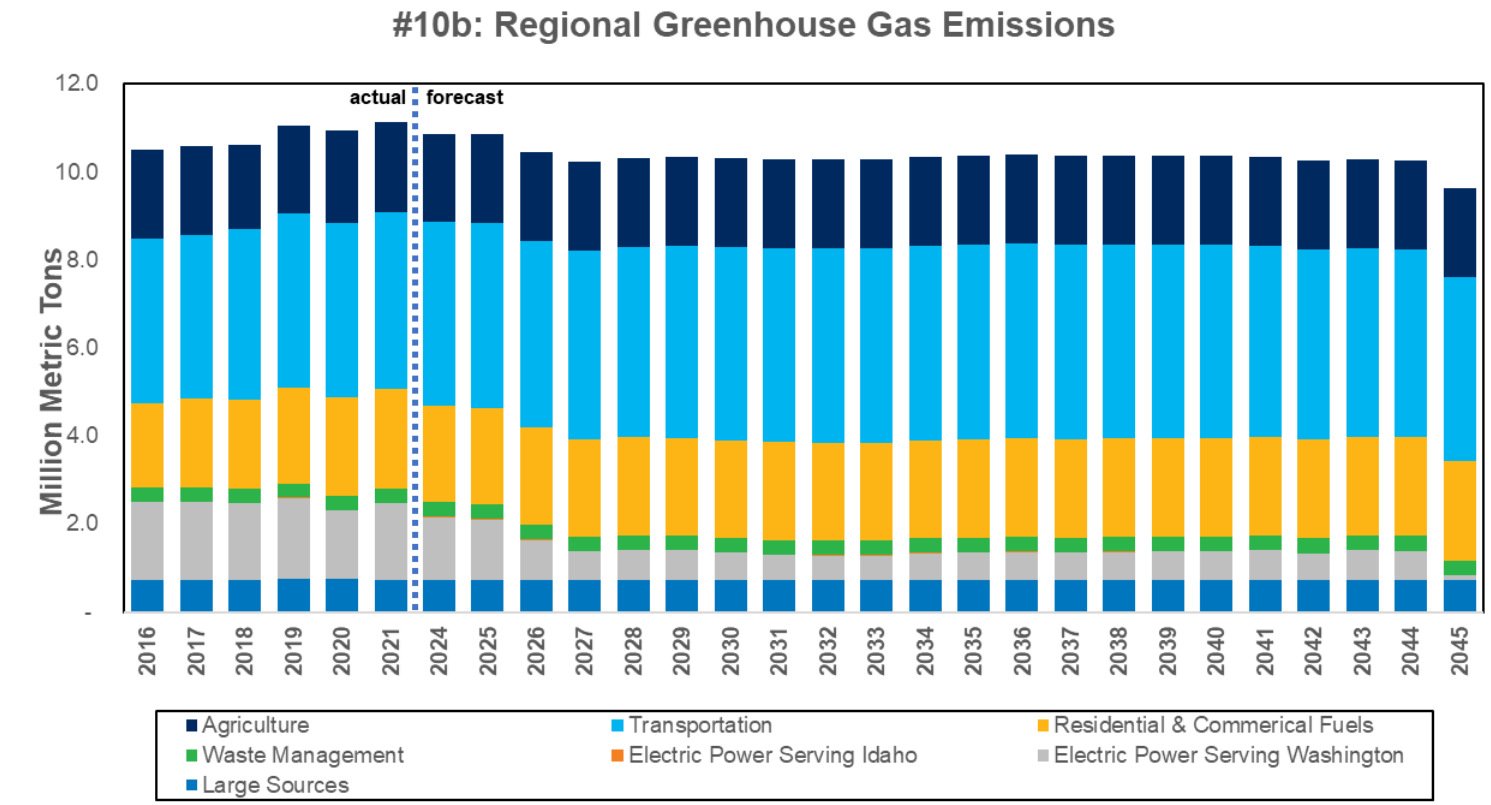
Greenhouse Gas Emissions

- Direct emissions are the WA portion of total system emissions.
- Net emissions are the WA portion of total system emissions net of market transactions.
- Significant reduction in 2025 from use of Colstrip for WA retail load.
- Net emissions begin to exceed direct emissions as more market purchases used to supply WA retail load.



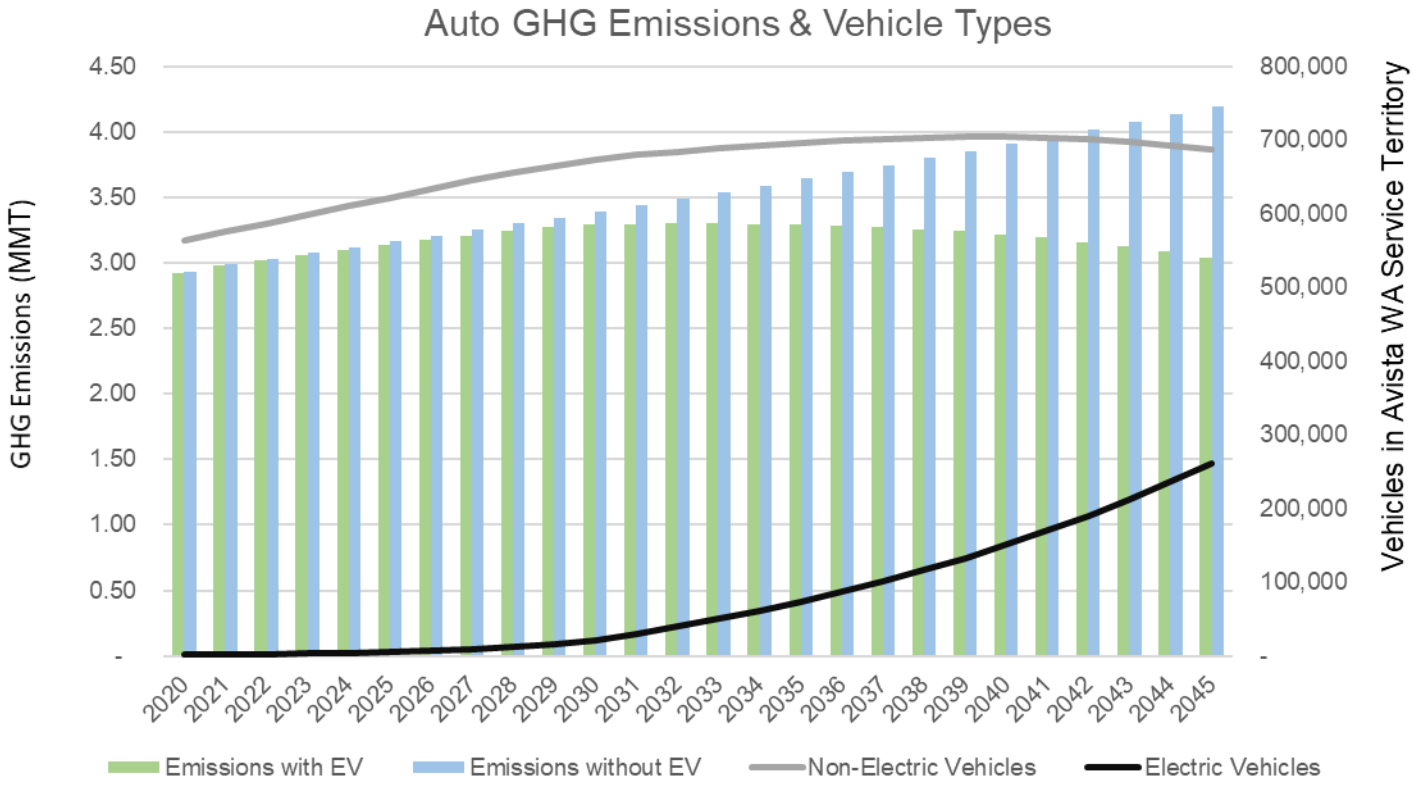
Greenhouse Gas Emissions

- Agriculture & large sources held constant over forecast period.
- Electric power from IRP modeling.
- Waste Management increases in proportion to population.
- Residential & commercial fuels from Gas IRP forecast.
- Transportation:
  - Rail held constant
  - Air increases in proportion to population
  - Auto from EV forecast



Greenhouse Gas Emissions

- Electric vehicle forecast from load forecast.
- In 2045 28.6% of vehicles are electric.
- Forecast includes increased gas efficiency over the planning horizon.
- 0.12 MMT increase over planning horizon.
- 1.16 reduction over no electric vehicle scenario.



*Emission estimates do not include full life cycle carbon emissions associated with each vehicle type

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2023 Progress Report Outline

Lori Hermanson, Senior Power Supply Analyst
Technical Advisory Committee Meeting No. 8
December 14, 2022

Progress Report Outline

- Chapter 1 - Progress Report Introduction
- Chapter 2 - Economic and Load Forecast
- Chapter 3 - Existing Supply-side Resources
- Chapter 4 - Long-term Position
- Chapter 5 - Distributed Energy Resources (includes EE and DR)
- Chapter 6 - Supply-side Resource Options
- Chapter 7 - Transmission & Distribution
- Chapter 8 - Market Analysis
- Chapter 9 – Placeholder Resource Strategy
- Chapter 10 - Customer Impacts

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Next Steps

James Gall, Manager of Integrated Resource Planning
Technical Advisory Committee Meeting No. 8
December 14, 2022

Next Steps

- Washington Progress Report to be filed **January 3, 2023**
- Virtual Public Meetings on **March 8, 2023**
- Schedule Changes
  - Combines February and March meetings
    - Next TAC meeting **March 15, 2023**, 9am to 4pm (in person/ Teams)
  - Draft IRP release moved to **March 31, 2023**
- File final IRP **on June 1, 2023**
- Schedule may change subject to RFP negotiations