2023 Electric Integrated Resource Plan

Technical Advisory Committee Meeting No. 9 Agenda

Tuesday, April 25, 2023

Microsoft Teams Virtual Meeting

Topic	Time	Staff
Introductions & Process Update	9:30	John Lyons
Resource Acquisitions/Divestures	9:45	Chris Drake
Preferred Resource Strategy • Energy Efficiency • Demand Response • Resource Selection • Avoided Cost • Market Dependence	10:30	IRP Team
Lunch	11:30	
Preferred Resource Strategy (continued)	12:30	IRP Team
Portfolio Scenario Analysis	1:00	IRP Team
Action Items For 2025 IRP	2:15	IRP Team
Adjourn	2:30	

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Introduction

Avista IRP Team
Technical Advisory Committee Meeting No. 9
April 25, 2023

Remaining 2023 Electric IRP TAC Meeting Schedule

- Today is the final TAC meeting for this IRP
- This meeting is being recorded and notes transcribed
- External IRP draft released to TAC on April 11, 2023, after completion of 2022 All-Source RFP
- Public comments due by May 12, 2023, via email, call, or letter
- Final 2023 Electric IRP submission to both Commissions and TAC on June 1, 2023
- Commissions will issue more details about process and timelines for feedback and comments
- 2025 IRP schedule will be sent to TAC and posted on website as developed

Today's Agenda

9:30	Introductions, John Lyons
9:45	Resource Acquisitions/Divestitures, Chris Drake
10:30	Preferred Resource Strategy, IRP Team

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

11:30	Lunch
12:30	Preferred Resource Strategy (continued), IRP Team
1:00	Portfolio Scenario Process, IRP Team
2:15	Action Items of 2025 IRP, IRP Team
2:30	Adjourn

2022 All Source RFP Update to IRP TAC #9

Chris Drake, Manager of Resource Optimization and Marketing
Technical Advisory Committee Meeting No. 9
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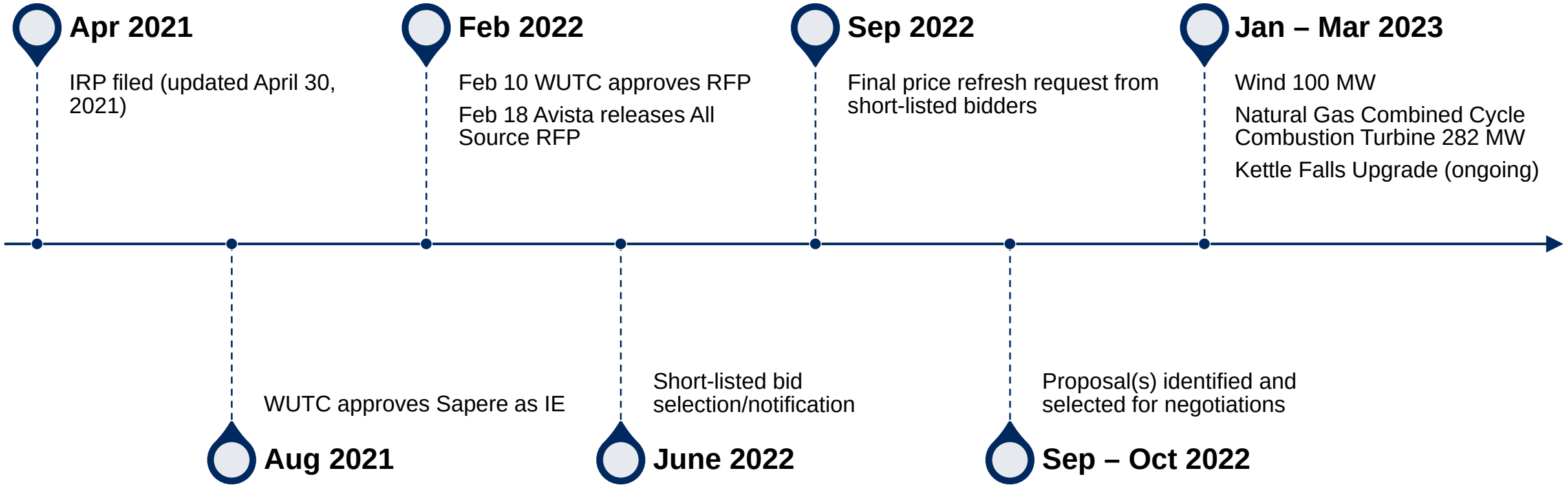
Agenda – All Source Request for Proposal (RFP)

Process

Evaluation

Results

2022 All Source RFP Design and Regulatory Process



2022 All Source RFP and Proposal Highlights

Define Resource Need

- 196/190 MW Winter/Summer Capacity
- 131 aMW Renewables
- 266 aMW Monthly Energy

Evaluate RFP Bids

- 11 Technology Types
- 32 Proposals with Options

Technology Types

- Primarily wind/solar
- Many projects with storage options

Independent Evaluator (IE)

Advise	• Advise on Avista's Development of RFP
Evaluate	• Parallel evaluation of Risks, Burdens, and Benefits
Verify	• Inputs, Assumptions and Scoring
Ensure	• Fair, transparent, and proper evaluation process

As required by WAC 480-107-023

Evaluation Process – Short List Selection

2022 REVISIONS

Financial

- Evaluation initially on highest score of Capacity or Energy
- Short-list analysis also included portfolio stack

Equity (CBI focus)

- Non-Energy Impacts
- Financial Energy Impact
- Environmental

Evaluation Scoring Matrix

Weighting						
20%	40%	5%	20%	10%	5%	100%
Risk Management	**Financial Energy Impact***	**Price Risk**	**Electric Factors**	**Environmental**	**Non-Energy Impact****	**Total Score**
Developer Experience, Proven Technology, etc.	Financial Analysis of Price to include PPA/Ownership, capacity costs/value, transmission, cost of carbon, etc.	Potential for change in costs, fixed vs variable pricing, variable energy, etc.	Interconnection status and transmission plan	Permitting such as Conditional Use Permit, SEPA, Studies, etc.	Energy security, benefit to service territory, named communities, DEI, etc.	

CBI – Customer Benefit Indicator. RFP incorporated proposed CBIs.

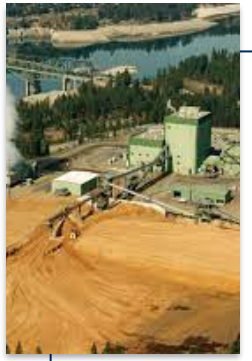
RFP Results – Contracted Resources

Natural Gas 280 MW

- Lancaster Combined Cycle Combustion Turbine
- 15-year extension

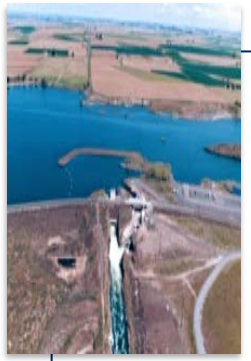
Wind 100 MW

- 30-year Commercial Operation Date 1/1/2026



Biomass 11.2 MW net

- Kettle Falls Generating Station upgrade
- 20-year subcontracts



Seasonal Hydro 146 MW

- Columbia Basin Hydropower
- Irrigation-based hydroelectric

Columbia Basin Hydropower (non-RFP)

Project Description

- Located in Central Washington
- 7 projects which layer in from 2023 through 2030 – expire 12/31/45

Contract Term

- 23-Year Purchase Power Agreement

Energy Impacts (Capacity, Energy)

- 146 MW of additional capacity
- Generation mid-March through mid-October, summer peaking

Additional Factors

- Separate bidding process but evaluated using All-Source RFP process

Wind - PPA

Project Description

- 100 MW Wind farm

Contract Term

- 30-year Power Purchase Agreement
- COD - Commercial operation date by Jan 2026

Energy Impacts (Capacity, Energy)

- 100 MW

Lancaster Natural Gas CCCT

Project Description

- Combined cycle combustion turbine in Rathdrum, Idaho

Contract Term

- PPA extends Avista's existing PPA at the end of the current 25-year deal (15 years, 11/1/2026 – 12/31/2041)

Energy Impacts (Capacity, Energy)

- 280 MW
- Project contributes significant capacity and energy benefits

Additional Factors

- Optimize existing natural gas resource
- No new natural gas development
- Avista has control of natural gas transportation to facility
- Facility is directly connected to Avista's balancing authority

Kettle Falls Upgrade

Myno Steam Supply

Project Description

- Myno to construct Carbon Reduction Facility (CRF) adjacent to KFGS
- CRF provides steam enabling KFGS to increase maximum net generation
- Avista utilizes and expands existing biomass feedstocks to sell to the CRF

Contract Term

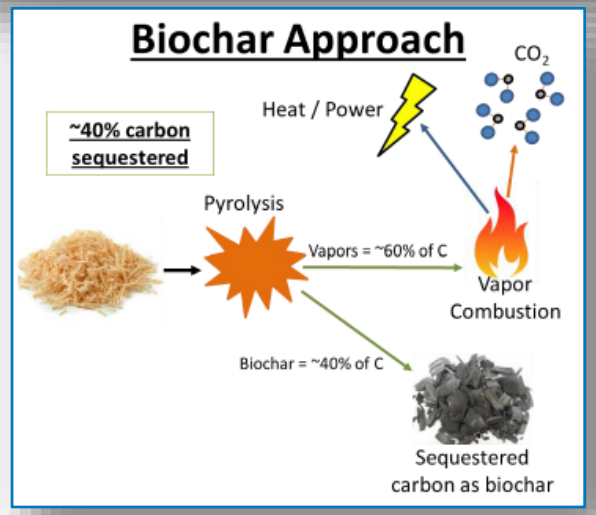
- 20-Year Agreement

Energy Impacts (Capacity, Energy)

- 11.2 MW capacity increase
- Greater than 100% capacity factor as CRF offsets some steam generation by KFGS

Additional Factors

- 30% reduction in NOx emissions intensity (/MWh)
- 30% reduction in CO/VOC emissions intensity (/MWh)
- Potential delay in Avista expansion of ash disposal facility



Colstrip Divestiture

- Ownership of Colstrip
  - Transfers to Northwestern Energy December 31, 2025
- Remediation
  - Avista retains remediation obligations, and
  - Voting rights with respect to remediation activities
- Transmission
  - Colstrip Transmission System rights are not transferred

2023 Preferred Resource Strategy

Avista IRP Team
Technical Advisory Committee Meeting No. 9
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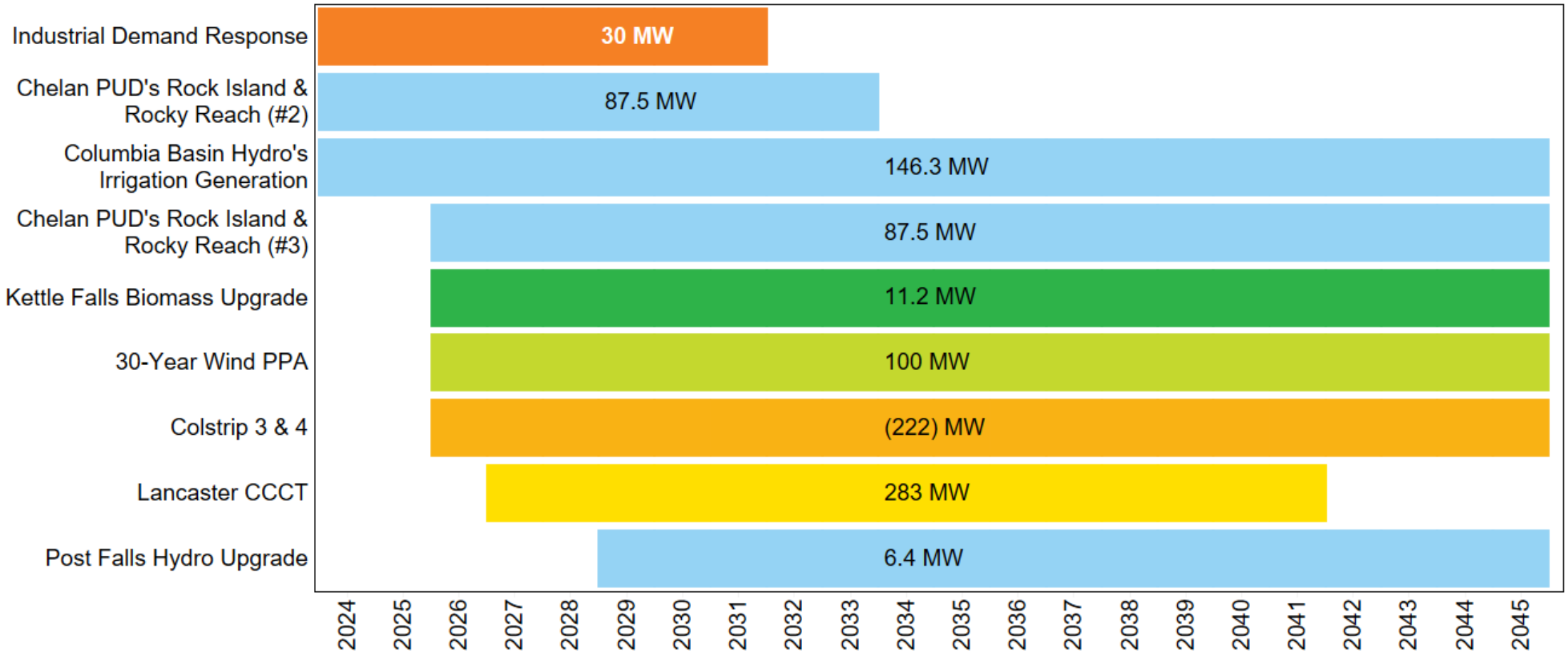
Safe Harbor Statement

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.

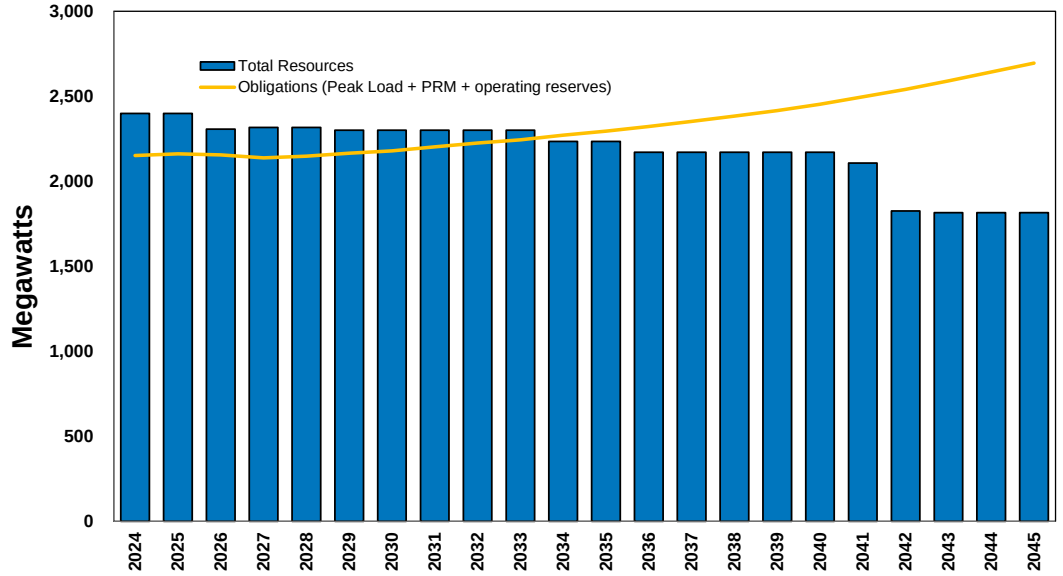
For a further discussion of these factors and other important factors, please refer to the Company's reports filed with the Securities and Exchange Commission. The forward-looking statements contained in this document speak only as of the date hereof. The Company undertakes no obligation to update any 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.

Resource Commitments (Total 976 MW of Transactions)

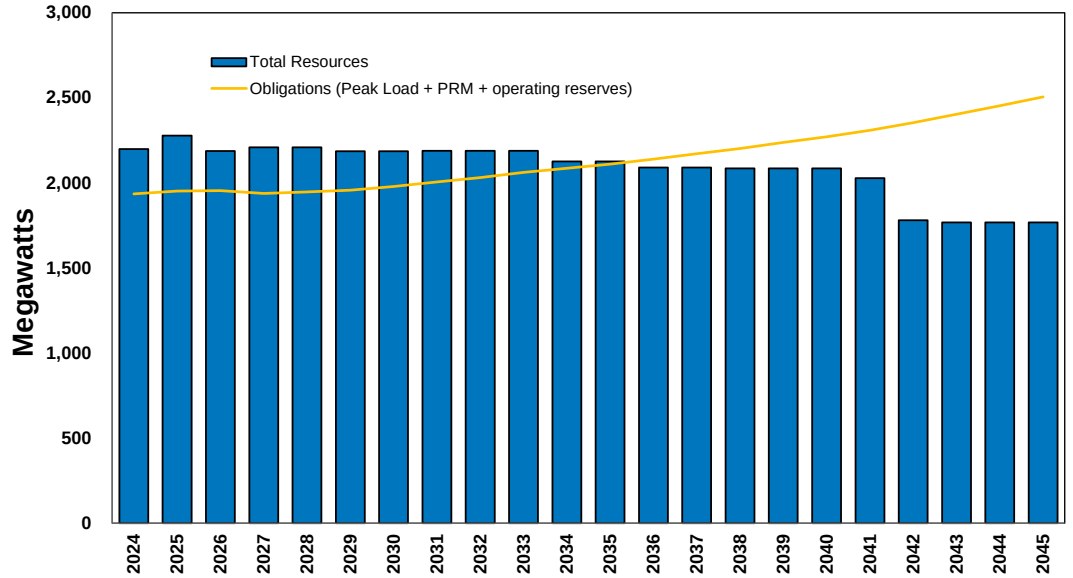


Resource Position

Winter Peak



Summer Peak



Energy Position

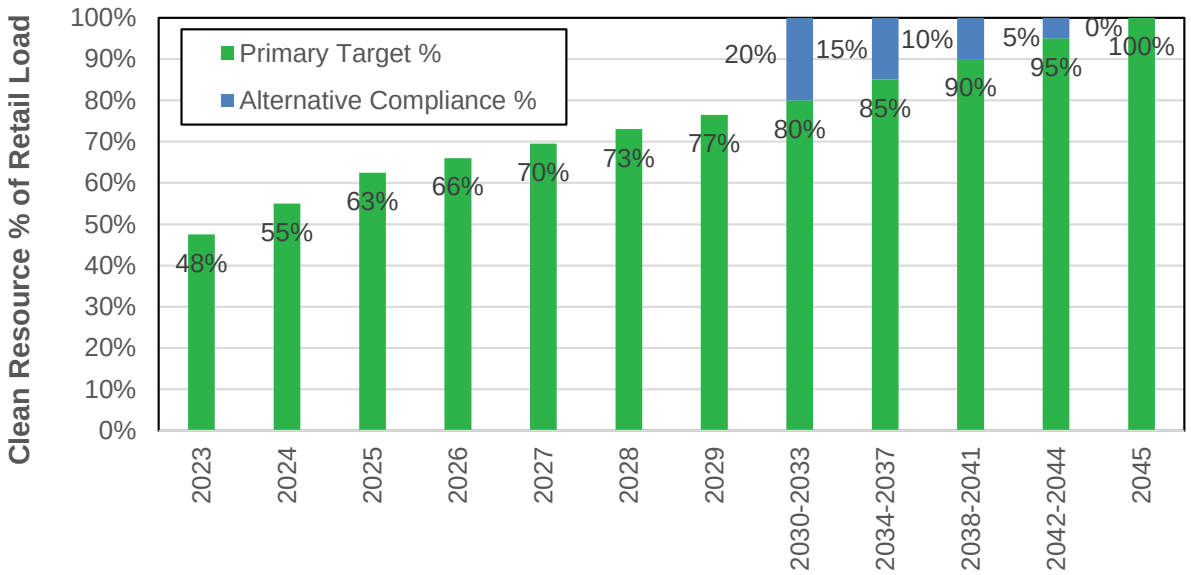
Month	2025	2030	2035	2040	2045
January	218	109	35	-3	-829
February	216	76	27	-26	-823
March	375	260	210	168	-603
April	551	427	360	311	-326
May	691	604	540	486	-17
June	737	621	540	447	-175
July	395	240	200	104	-672
August	266	135	59	-8	-766
September	339	222	176	135	-603
October	346	218	148	81	-677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

Assumed Retirements

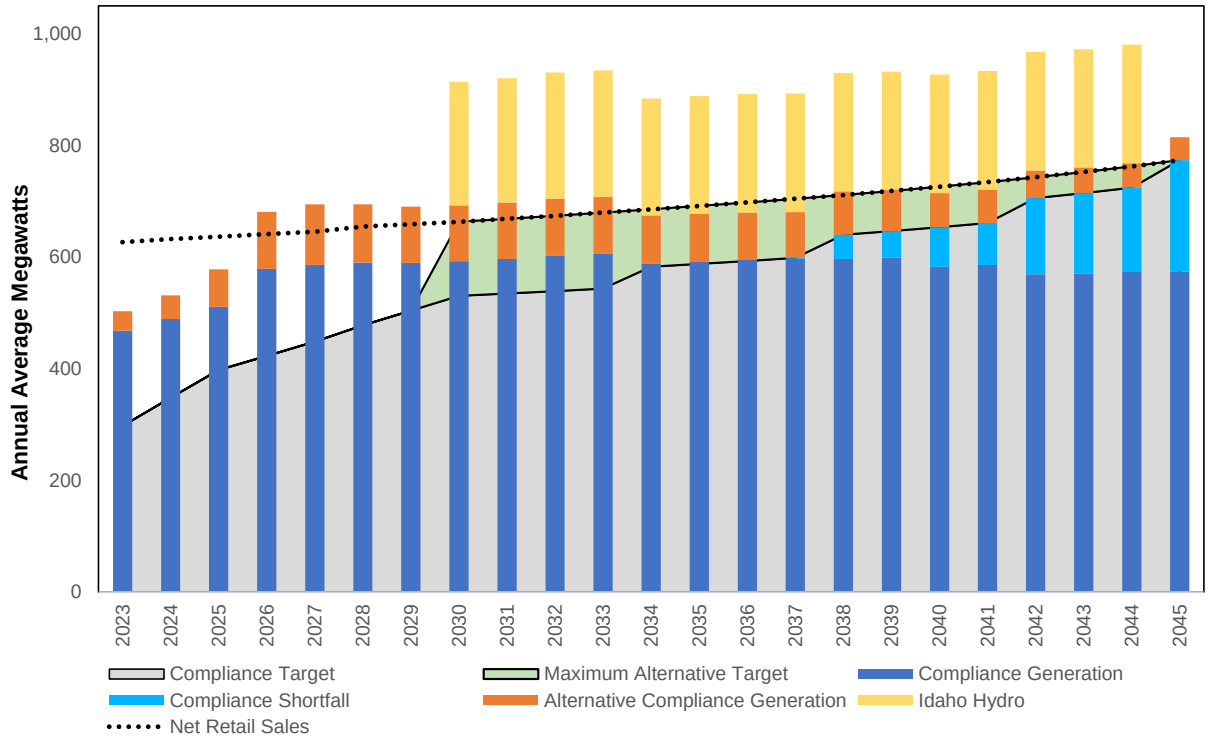
Resource	Fuel Type	Year	January Capacity MW
Colstrip Units 3 & 4	Coal	2025	222.0
Northeast Units A & B	Natural Gas	2035	66.0
Boulder Park (1-6)	Natural Gas	2040	24.6
Kettle Falls CT	Natural Gas	2040	11.0
Rathdrum Units 1 & 2	Natural Gas	2044	176.0
		Total	499.6

CETA Renewable Energy Goal

Potential CETA Requirements



CETA Position



What is PRiSM?

- Preferred Resource Strategy Model
- Mixed Integer Program (MIP) used to select new resources to meet resource needs of our customers

Excel — The user interface

LINDO SYSTEMS INC. — What's Best! — The solver interface

GUROBI OPTIMIZATION — The solver

Objective Function

Intro to linear programing: https://www.youtube.com/watch?v=Uo6aRV-mbeg

Minimize: (WA “Societal” $NPV_{2023\text{-}45}$) + (ID $NPV_{2023\text{-}45}$)

Where:

WA $NPV_{2023\text{-}45}$ = Market Value of Load + Existing & Future Resource Cost/Operating Margin + Social Cost of Carbon + EE TRC + NEI

ID $NPV_{2023\text{-}45}$ = Market Value of Load + Existing & Future Resource Cost/Operating Margin + EE UTC

Subject to:

- Generation Availability & Timing
- Energy Efficiency Potential
- Demand Response Potential
- Monthly Peak Requirements
- Monthly Energy Requirements
- Monthly Clean Energy Targets

Optimization Tolerance: 0.0001 or 1,500 seconds (Note: certain studies longer solution times allowed)

Optimized Cost vs. Actual Costs

- Objective function includes social costs that are not part of utility revenue requirement.
- This is used for resource optimization only.
- Social costs may include:
  - Energy Efficiency
    - TRC
    - Non-energy impacts
    - Power Act 10% adder
    - T&D Savings
  - Social Cost of Carbon

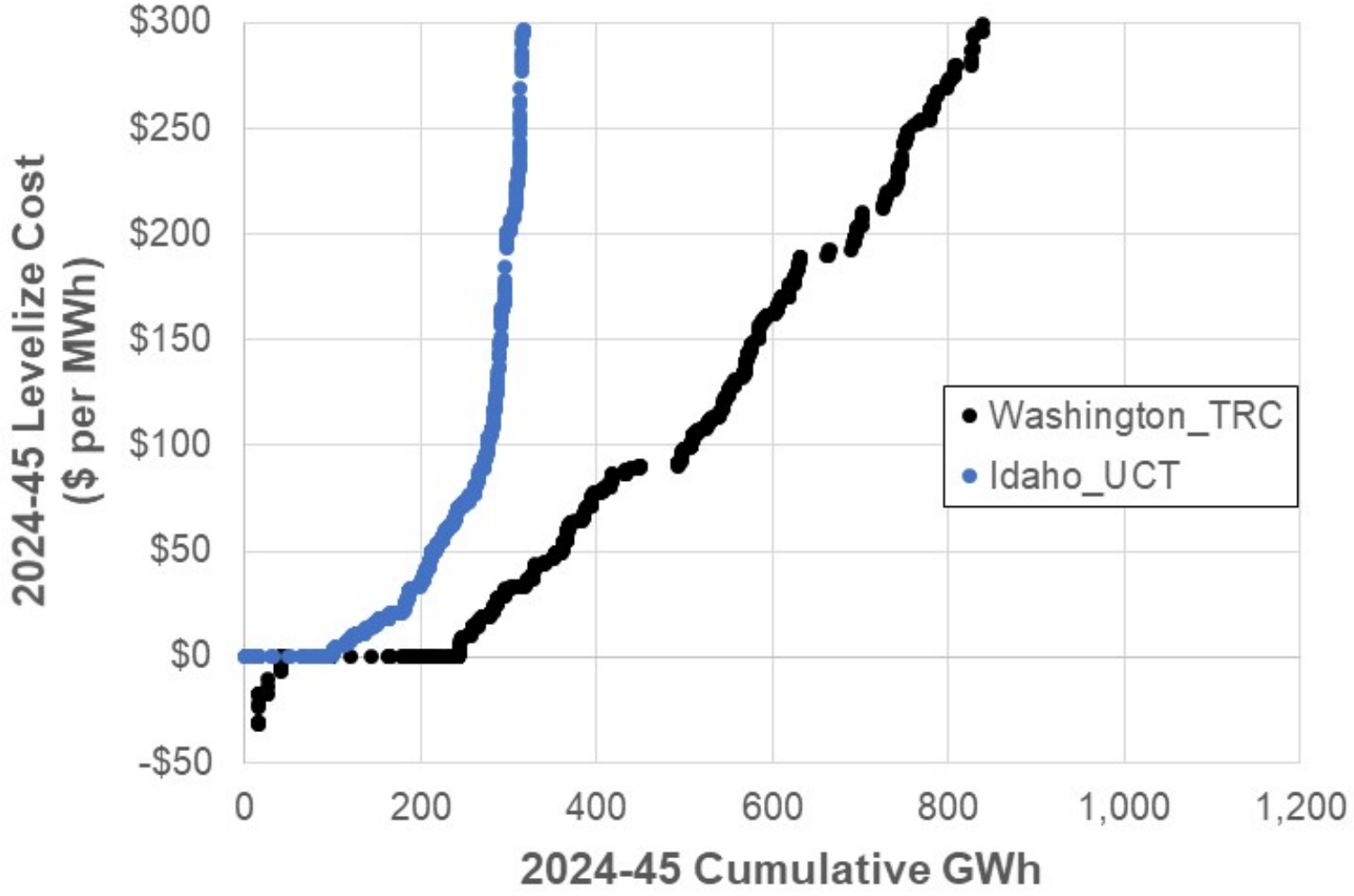
- Actual costs illustrate expected cost ratepayers will pay.
- Estimate annual revenue requirements.
- Estimate average energy rates.

Named Community Investment Fund Projects

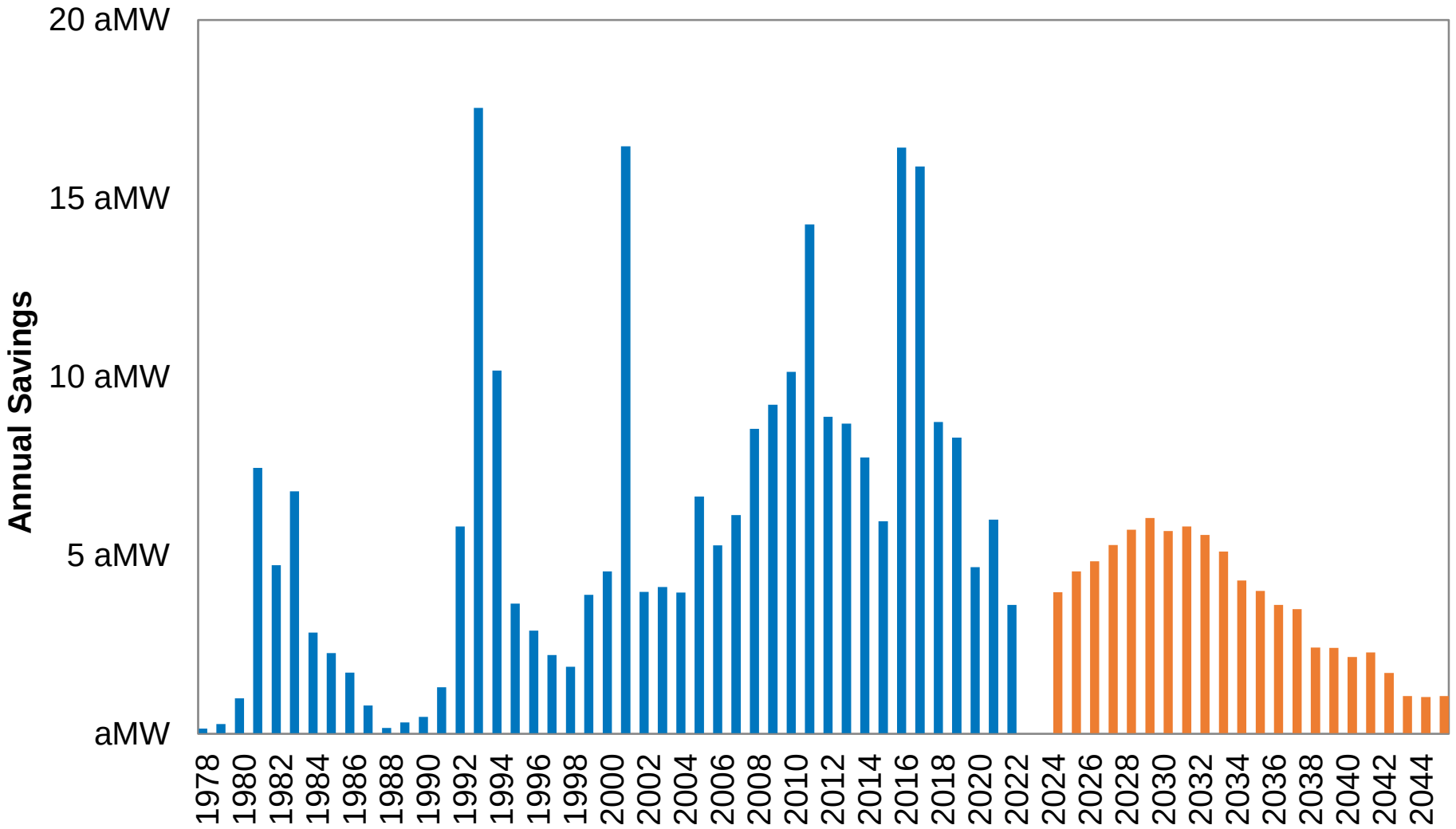
- Methodology
  - Spending constraints
    - $2 million annually in low-income energy efficiency beyond cost effective programs.
    - $400k distributed energy resources (plus $100k for program administration).
    - Takes advantage of state incentive funding.

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

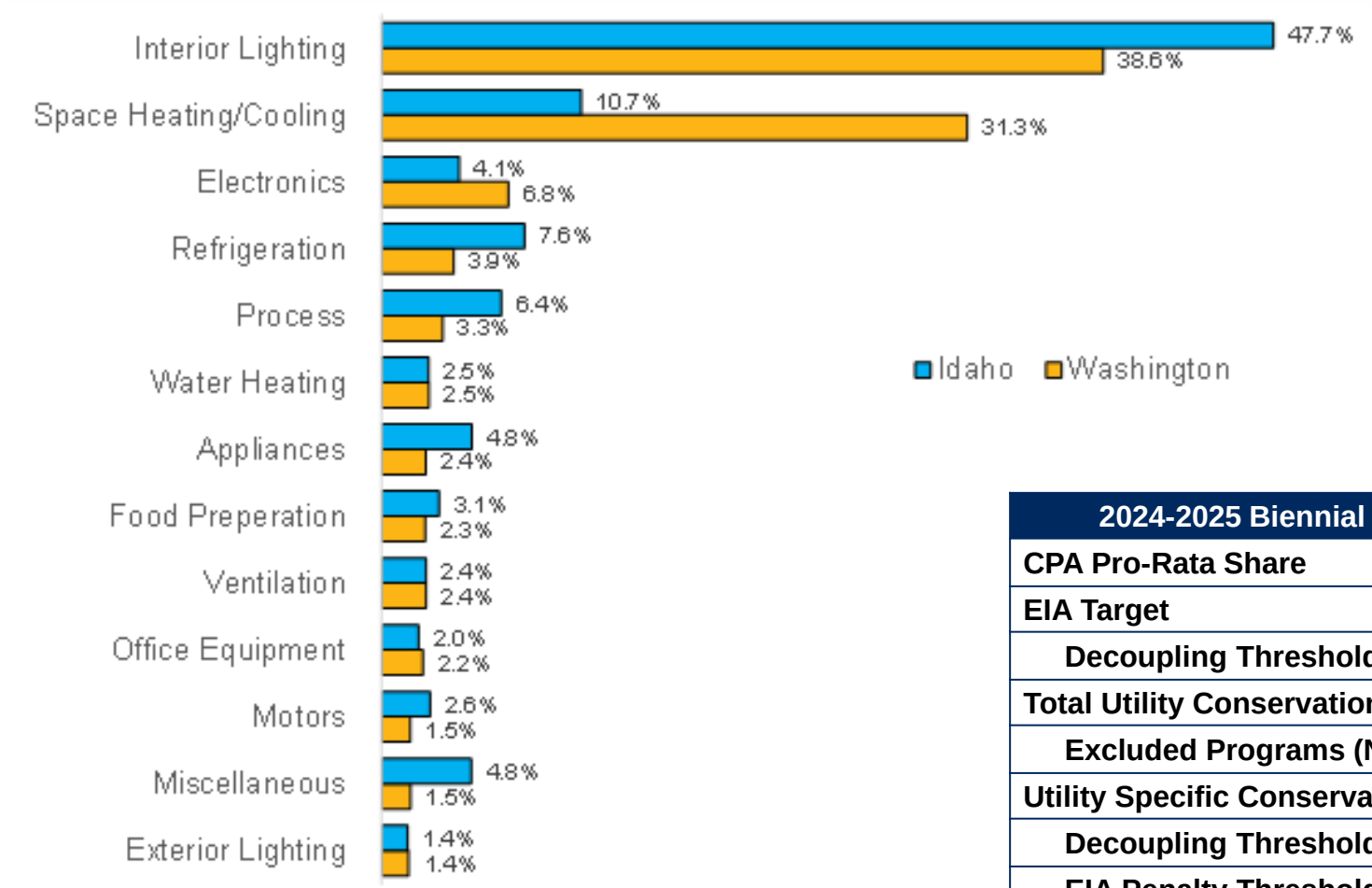
2024-2045 Cumulative Energy Efficiency Supply Curve



Annual Historical and Forecasted Energy Efficiency



Savings Types by State & Washington Biennial Target



2024-2025 Biennial Conservation Target (MWh)	
CPA Pro-Rata Share	63,374
EIA Target	**63,374**
Decoupling Threshold	3,226
Total Utility Conservation Goal	**66,600**
Excluded Programs (NEEA)	-10,162
Utility Specific Conservation Goal	**56,438**
Decoupling Threshold	-3,226
EIA Penalty Threshold	**53,212**

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.

Supply-Side Resource Selection

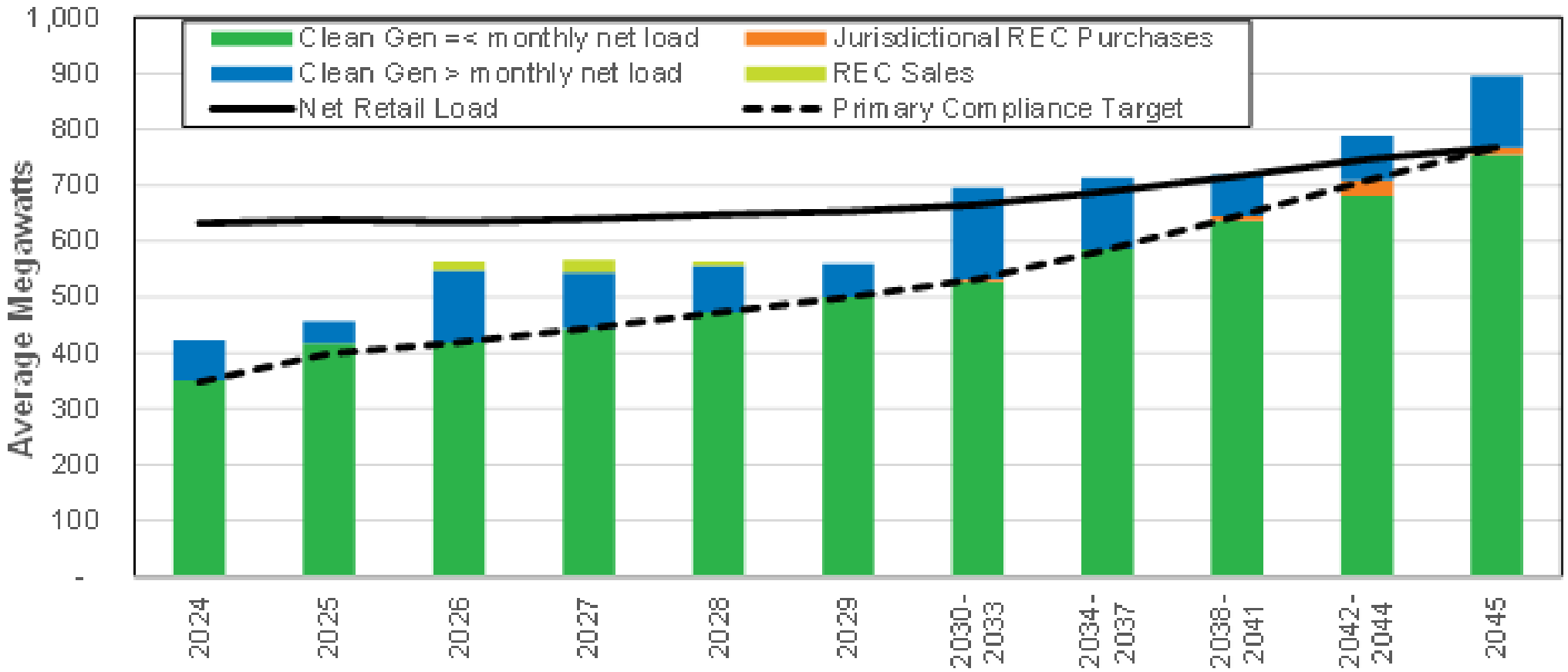
Resource	Time Period	Jurisdiction	Capacity (MW)	Energy Capability (aMW)
NW Wind	2030	WA	200	63
Montana Wind	2032	WA	200	97
Natural Gas CT	2034	ID	90	86
Renewable Fueled CT	2036	WA	88	31
Long Duration Storage (>24 hr)	2039	WA	52	-1
PPA Wind Renewal	2041	WA	140	53
Renewable Fueled CT	2041	WA	74	26
Natural Gas (ICE)	2041	ID	46	46
PPA Wind Renewal	2042	WA	105	36
Renewable Fueled CT	2042	WA	186	65
Natural Gas CT	2042	ID	102	97
Long Duration Storage (>24 hr)	2043	WA/ID	68	-1
NW Wind	2044	WA	100	31
Long Duration Storage (>24 hr)	2044	WA/ID	50	-1
NW Wind	2045	WA	200	63
Renewable Fueled CT	2045	WA	348	122
Natural Gas (ICE)	2045	ID	65	65
Short Duration Storage (<8 hr)	2045	ID	25	0
		Total New Resources	**2,139**	**878**

Renewable 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

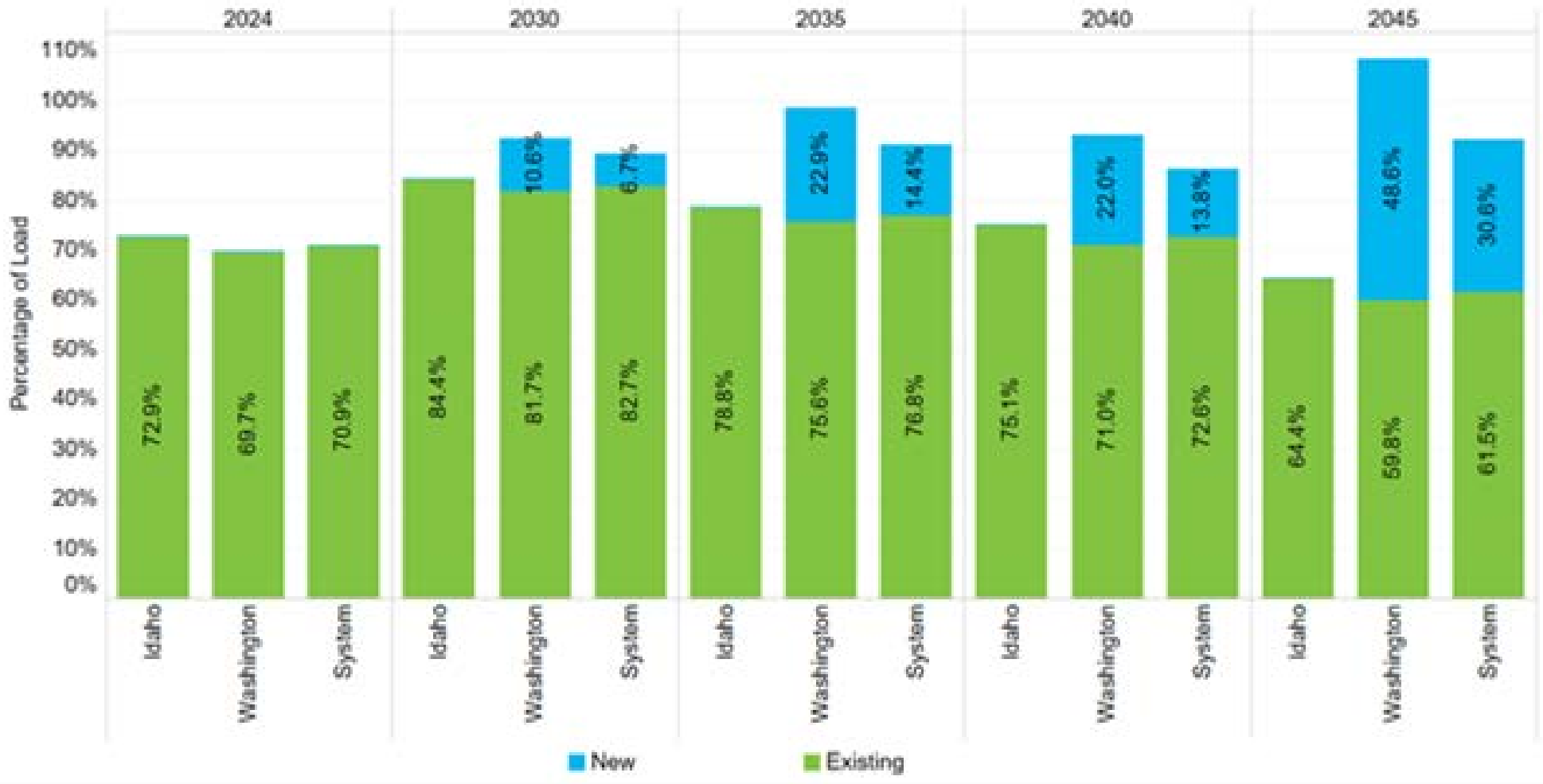
Transmission Needs

- 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.

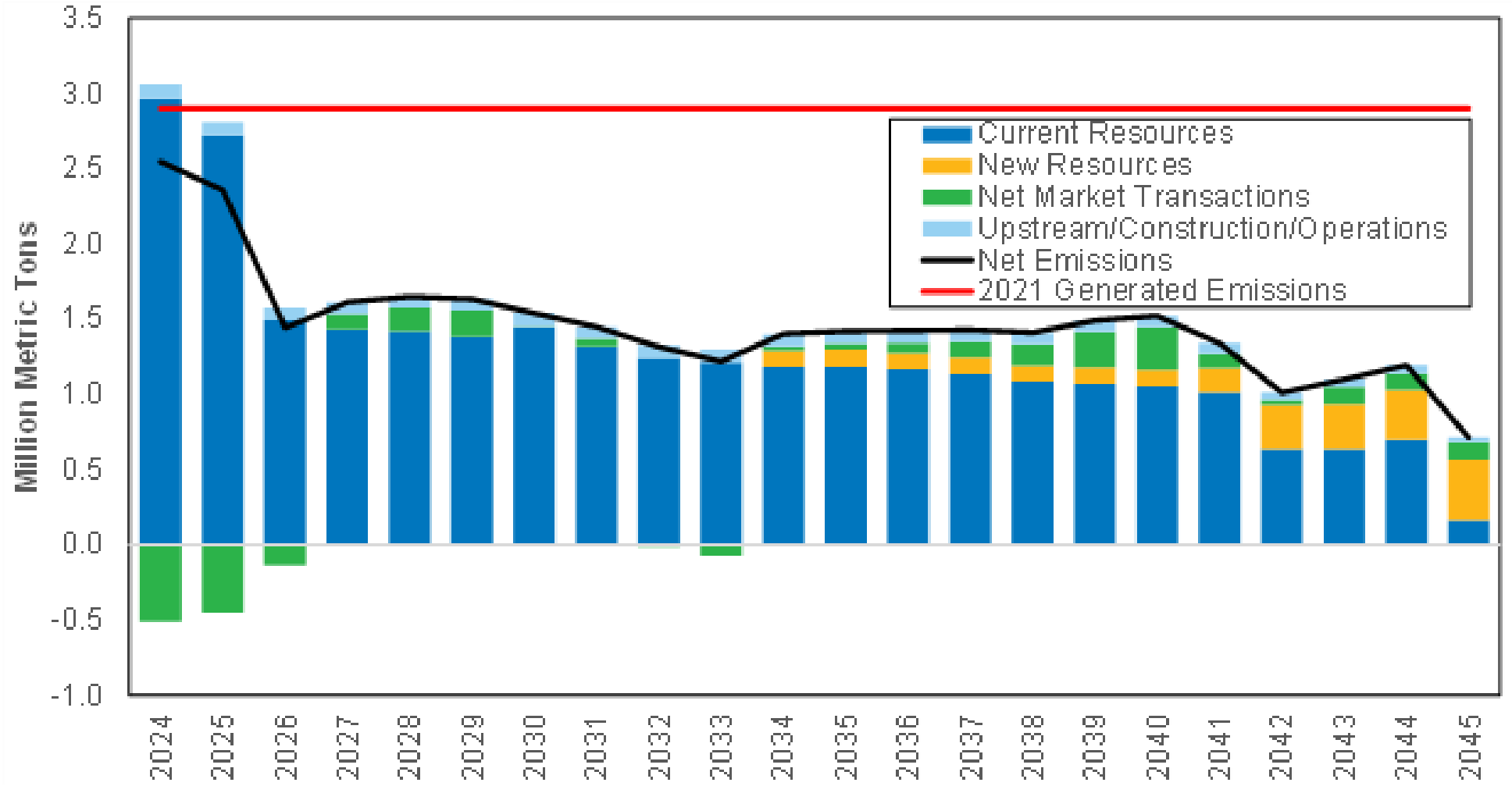
Washington CETA Clean Energy Comparison (aMW)



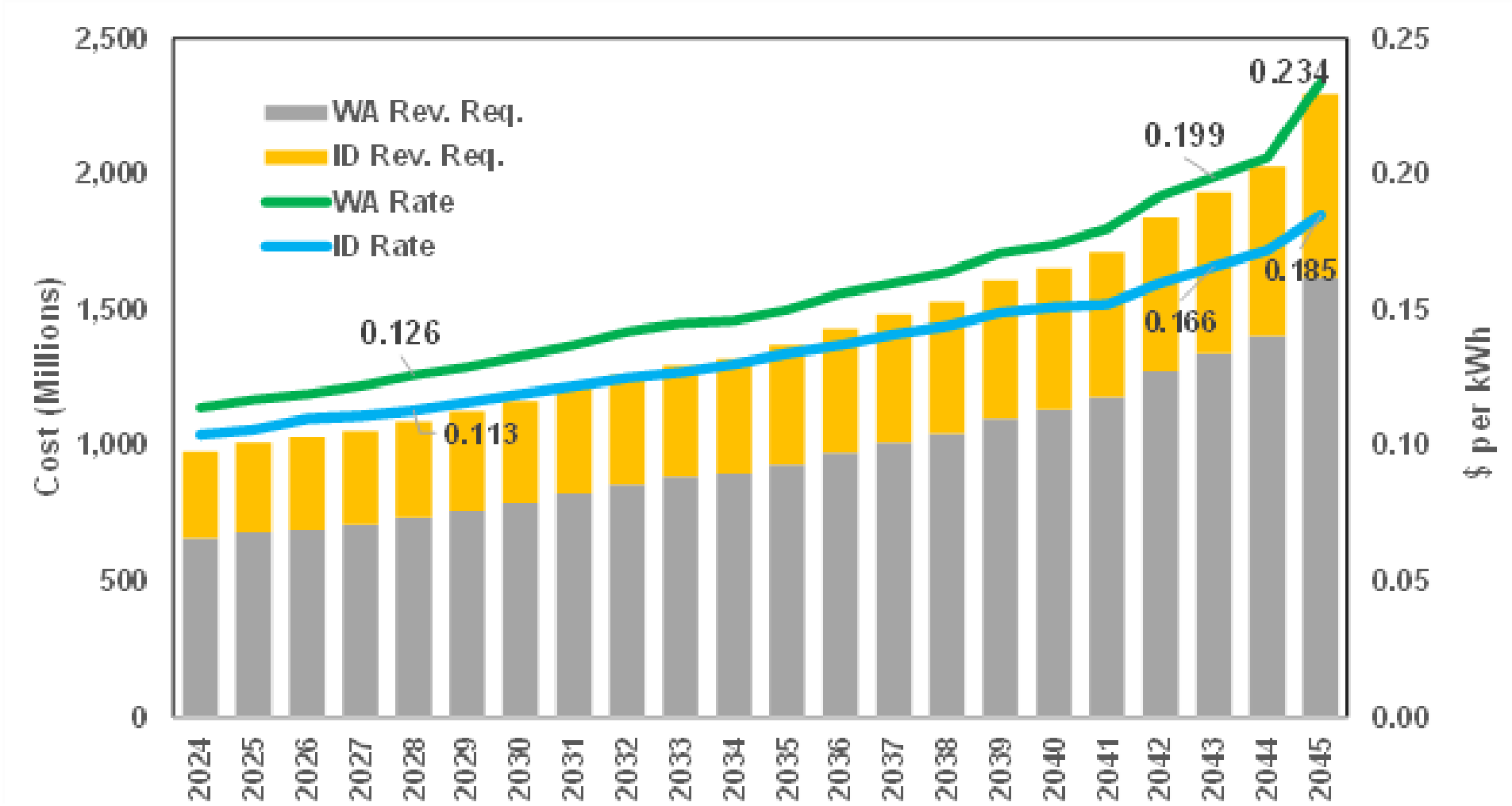
Clean Energy Creation



Emissions Forecast



Cost and Rate Forecast



Avoided Cost- IRP Methodology

Year	Flat ($/MWh)	On-Peak ($/MWh)	Off-Peak ($/MWh)	Clean Energy Premium (MWh)	Capacity ($/kW-Yr)	Clean Capacity Premium ($/kW-Yr)
2024	$42.87	$46.10	$38.56	$0.00	$0.0	$0.0
2025	$35.87	$38.33	$32.57	$0.00	$0.0	$0.0
2026	$33.24	$35.07	$30.80	$0.00	$0.0	$0.0
2027	$29.89	$30.82	$28.65	$0.00	$0.0	$0.0
2028	$29.83	$29.90	$29.74	$0.00	$0.0	$0.0
2029	$29.93	$29.52	$30.46	$0.00	$0.0	$0.0
2030	$34.65	$33.66	$35.97	$0.00	$0.0	$0.0
2031	$32.57	$31.59	$33.87	$0.00	$0.0	$0.0
2032	$31.63	$30.36	$33.33	$0.00	$0.0	$0.0
2033	$32.57	$31.17	$34.44	$0.00	$0.0	$0.0
2034	$33.11	$31.58	$35.14	$3.74	$93.0	$63.3
2035	$34.41	$32.40	$37.11	$3.82	$94.8	$64.6
2036	$35.06	$32.84	$38.03	$3.89	$96.7	$65.9
2037	$36.67	$34.93	$38.98	$3.97	$98.7	$67.2
2038	$36.37	$34.58	$38.76	$4.05	$100.6	$68.6
2039	$37.51	$35.26	$40.50	$4.13	$102.7	$69.9
2040	$39.50	$37.60	$42.02	$4.22	$104.7	$71.3
2041	$39.70	$37.85	$42.16	$4.30	$106.8	$72.8
2042	$41.46	$40.31	$42.99	$4.39	$108.9	$74.2
2043	$42.40	$41.44	$43.69	$4.47	$111.1	$75.7
2044	$47.58	$46.70	$48.76	$4.56	$113.3	$77.2
2045	$47.48	$46.42	$48.88	$4.65	$115.6	$78.8
20 yr. Levelized	**$34.87**	**$34.67**	**$35.15**	**$1.41**	**$35.0**	**$23.8**
22 yr. Levelized	**$35.44**	**$35.20**	**$35.76**	**$1.55**	**$38.6**	**$26.3**

Market Reliance Modeling

Assessment of market reliance risk due to variations in load, hydro, and renewable generation

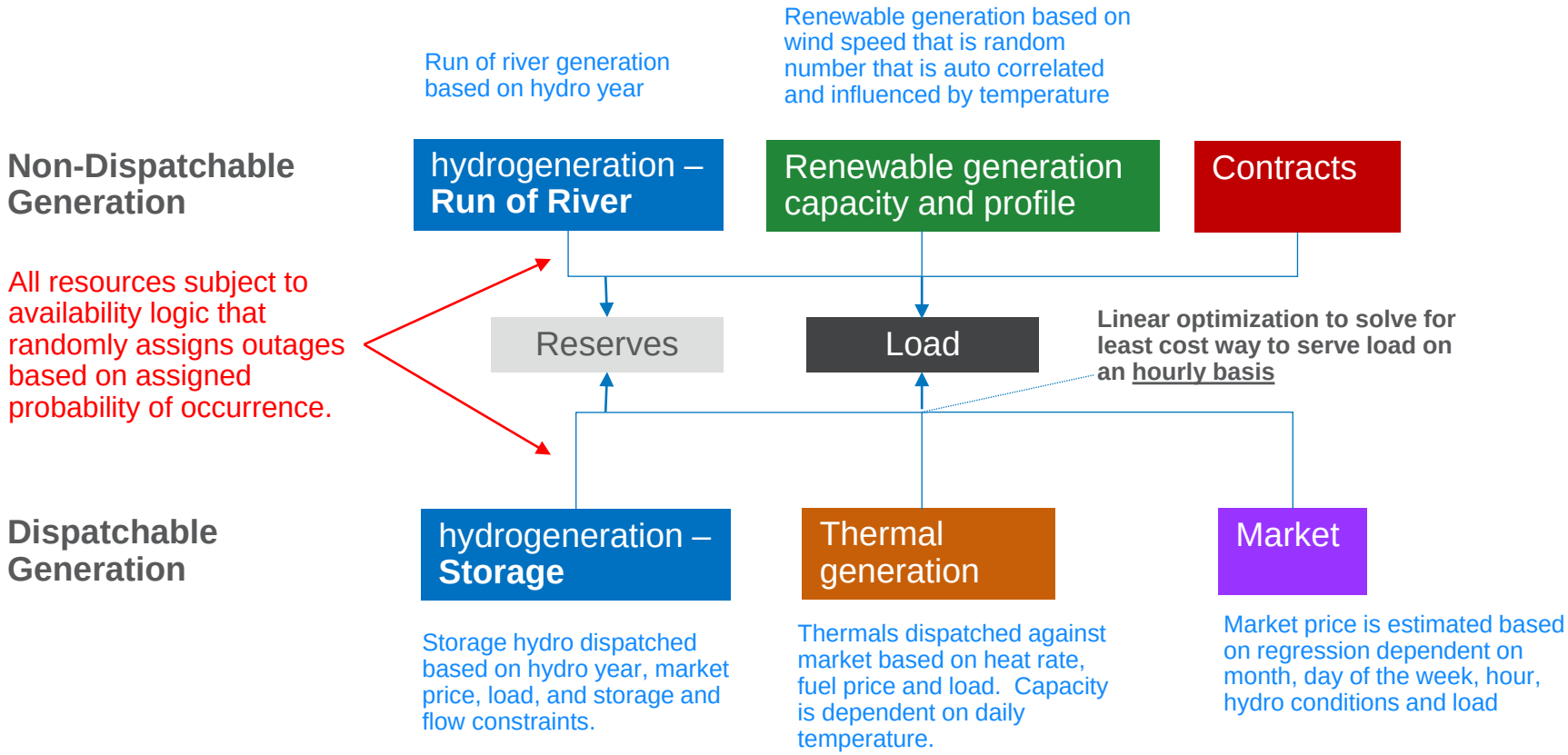
Mike Hermanson, Senior Power Supply Analyst
Electric IRP, TAC
April 25, 2023

Overview

- Loss of Load Probability (LOLP) analysis was conducted for the 2021 IRP
- 2023 IRP utilizes Western Resource Adequacy Program (WRAP) to address resource adequacy
- We are utilizing the same modeling approach to assess market reliance to serve load under various load, hydro, renewable and outage scenarios

Modeling Framework

- Excel based model with VBA code and linear optimization Excel Add-in What'sBest!



Model output:
Market purchases on an hourly basis required to serve load and any hours where there is a loss of load

Inputs - 2030

- 1,000 draws of load, hydro, and wind
- Thermal generation represents availability. Thermal dispatched according to market prices and heat rate

Load (aMW)

	Average	Max	Min
Average Load	1,067	1,255	1,014
Winter Peak	1,679	1,906	1,422
Summer Peak	1,627	1,871	1,438

Generation (aMW)

	Average	Max	Min
Annual Hydro	739	851	554
Wind	191	217	167
Coyote Springs	290	300	270
Lancaster	248	256	234
Rathdrum	143	153	126
Northeast	53	57	46
Kettle Falls CT	5	7	4
Boulder	19	21	16
Kettle Falls	55	57	52
TOTAL	**1743**	**1919**	**1469**

Results 2030

- Market purchases driven by market price/hydro dispatch

Average Market Purchases by Month/Hour

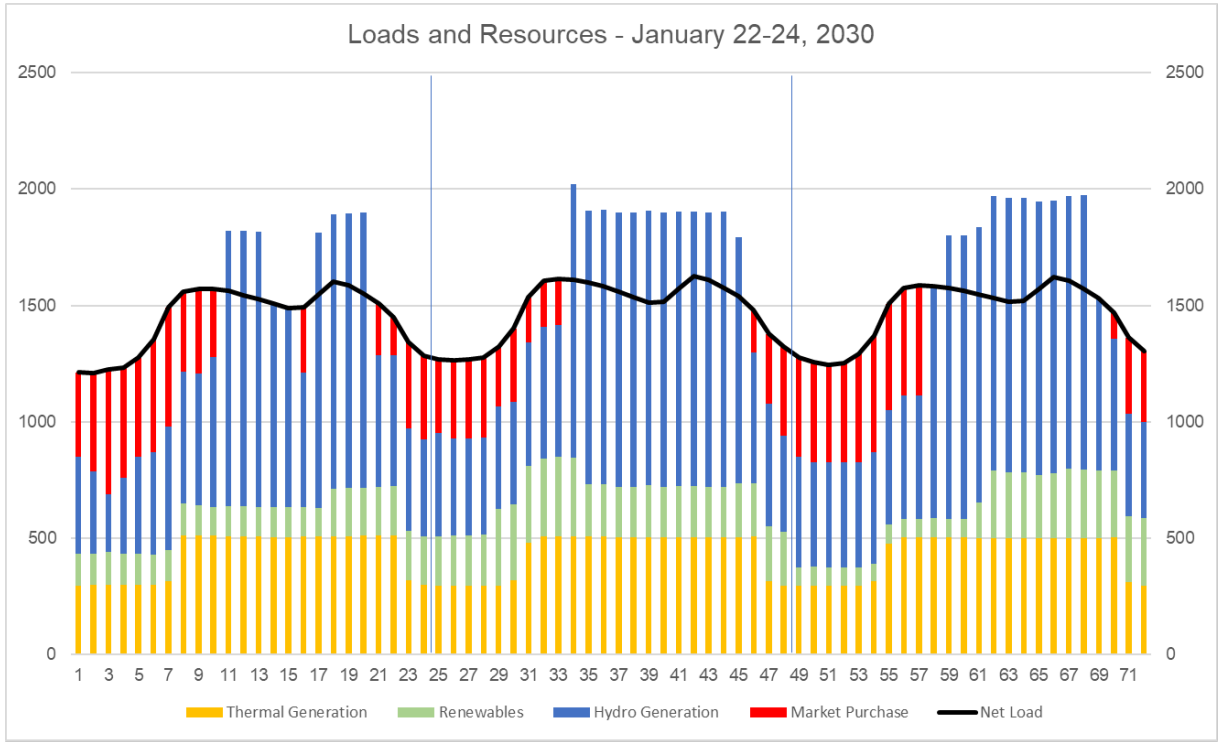
Month \ Hours	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	52	112	127	132	89	76	116	115	88	65	17	13	19	23	33	44	6	1	4	12	46	76	65	134
2	53	107	124	125	86	72	92	85	63	40	8	8	12	17	29	39	9	1	1	4	26	53	52	124
3	30	65	73	75	52	37	49	43	29	13	1	1	1	4	12	19	6	0	1	0	9	26	29	72
4	30	80	113	109	56	37	43	33	17	2	0	0	0	0	1	7	0	0	0	0	0	31	43	89
5	8	34	49	58	18	9	9	4	1	0	0	0	0	0	0	1	0	0	0	0	0	5	19	48
6	9	38	55	59	23	11	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	16	51
7	9	20	23	23	17	10	8	4	3	3	3	3	3	2	1	1	0	0	0	1	5	10	14	30
8	12	27	29	30	21	13	11	10	11	13	14	18	19	17	14	13	5	1	4	12	30	38	27	38
9	8	9	10	10	8	11	19	14	13	11	7	8	11	11	11	12	2	0	1	3	19	22	15	19
10	16	20	19	21	22	28	45	49	38	21	2	1	4	6	18	27	6	0	0	0	16	28	19	33
11	46	81	87	87	78	65	92	96	77	55	14	10	16	19	31	43	3	0	1	7	38	66	51	97
12	70	135	149	152	119	91	122	124	103	77	24	19	27	30	52	41	3	0	4	13	54	98	85	164

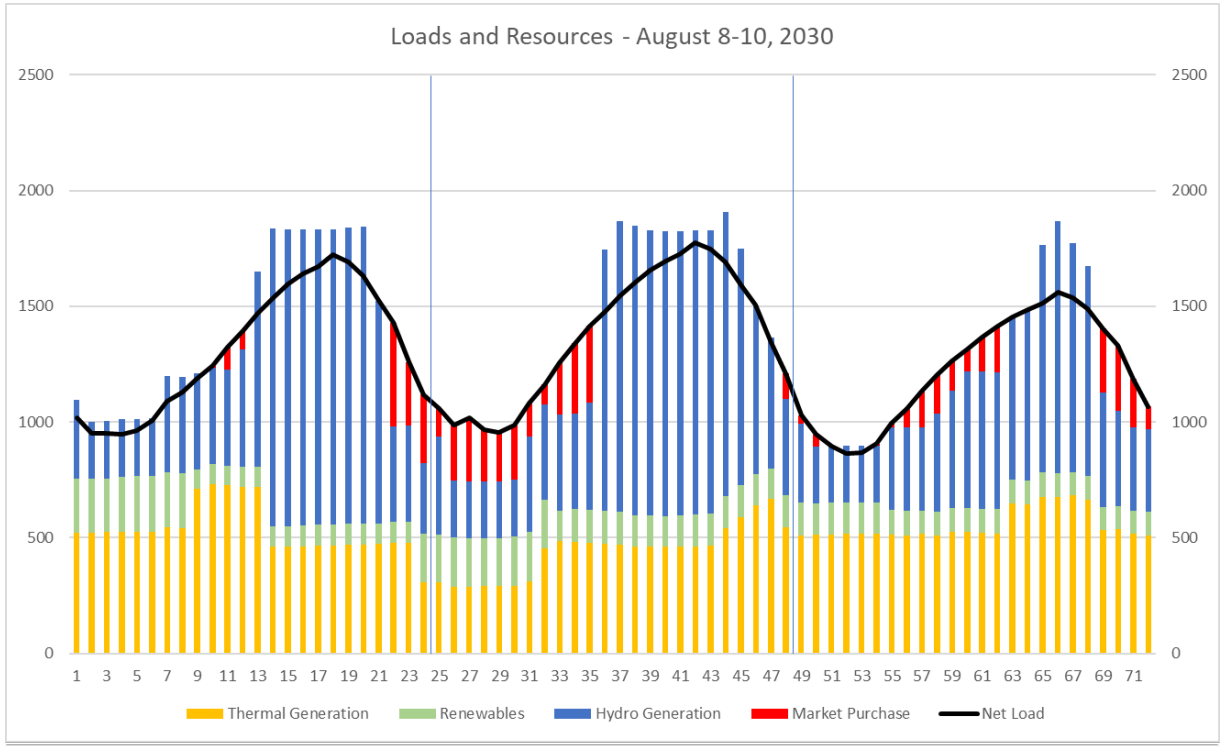
99th Percentile Market Purchases

Month \ Hours	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	381	520	553	556	480	455	574	578	480	483	160	140	175	235	355	415	117	37	84	146	386	458	415	553
2	378	507	546	540	465	431	494	483	418	318	104	102	127	169	290	352	119	27	38	80	211	377	358	531
3	279	408	423	426	383	344	387	339	267	147	25	23	38	92	148	204	116	14	22	18	129	240	292	412
4	148	386	473	468	271	170	182	156	109	42	0	0	0	0	13	71	3	3	3	3	5	138	151	391
5	72	225	314	361	180	84	95	61	30	12	2	0	2	0	0	29	0	1	0	0	8	65	111	259
6	104	222	278	304	176	112	100	57	20	12	4	0	0	1	0	0	0	0	0	0	11	40	126	240
7	112	211	226	220	194	130	128	86	65	78	61	61	56	53	30	34	0	0	0	17	85	172	178	282
8	201	278	283	270	247	212	222	203	194	200	207	224	229	168	125	119	69	32	68	118	300	315	276	338
9	180	197	194	191	194	211	261	234	207	175	118	140	152	129	122	141	54	13	31	52	223	241	232	256
10	234	264	261	267	273	292	337	349	314	212	41	30	63	91	191	263	91	8	3	18	171	270	240	301
11	381	455	468	474	460	444	499	492	421	354	135	112	147	159	264	317	69	13	48	97	273	398	373	487
12	431	551	573	576	532	470	535	520	467	413	156	137	166	178	276	226	69	6	79	124	294	456	448	585

Results - 2030

- Regular market conditions





Results - 2030

- Regional market constrained conditions (high/low temperatures)

50th Percentile Market Purchases During Regional Market Constrained Conditions

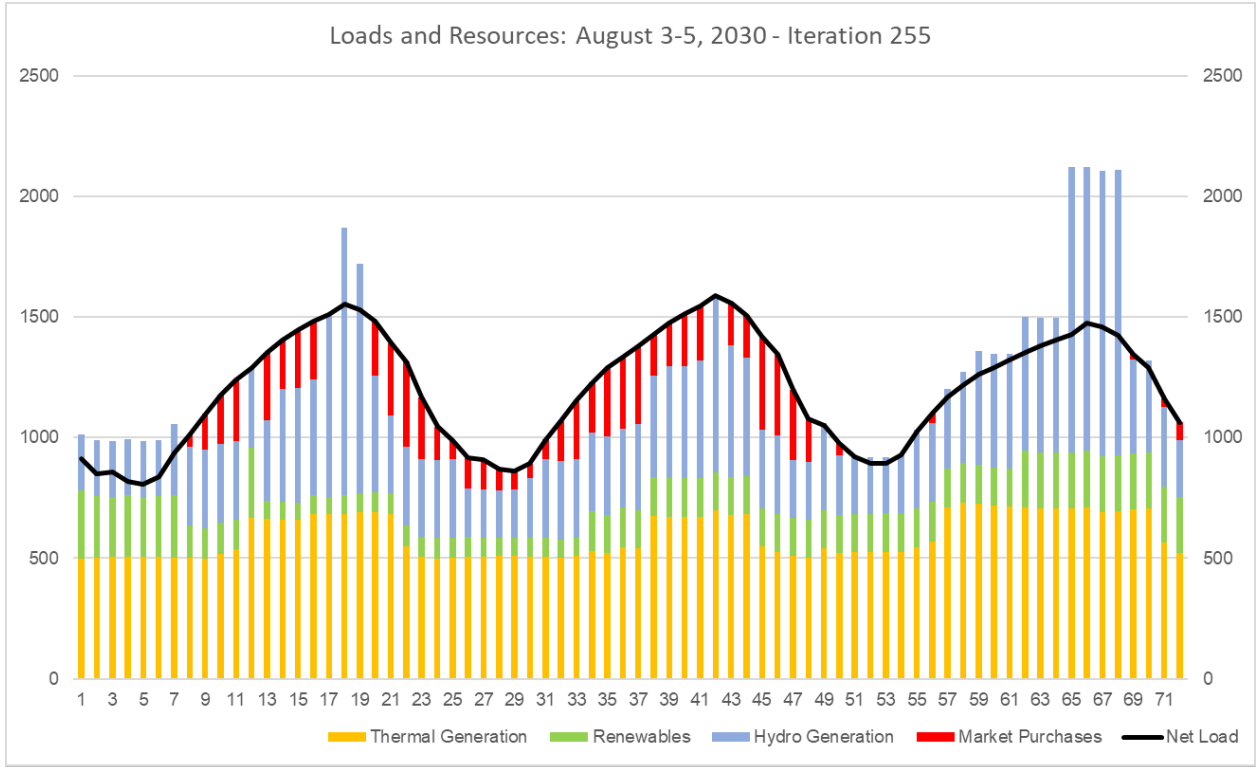
Months \ Hours	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	188	288	322	334	264	272	404	414	292	317	195	184	186	212	224	264	160	137	140	157	235	259	236	327
2	208	274	337	321	285	284	370	356	258	301	138	164	179	270	242	299	232	75	124	155	202	257	223	324
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	206	257	417	418	306	196	139	168	238	319	79	0	0	0	0	0	0	0	0	0	0	252	256	242
7	122	109	113	119	129	104	118	84	112	116	118	116	156	147	93	138	44	39	33	121	161	141	120	123
8	78	119	119	108	112	100	76	85	94	116	146	158	168	164	186	165	108	105	105	127	210	193	172	164
9	56	102	85	103	73	119	162	213	185	221	0	0	0	0	0	0	0	0	0	0	0	204	134	151
10	84	109	63	48	51	93	179	166	30	132	0	0	0	0	0	0	0	0	0	0	0	76	169	160
11	312	351	362	377	380	389	505	425	384	466	332	259	264	298	332	370	260	224	253	258	304	333	317	389
12	224	309	360	370	298	289	428	375	308	369	167	198	215	225	290	244	142	115	112	162	279	324	325	410

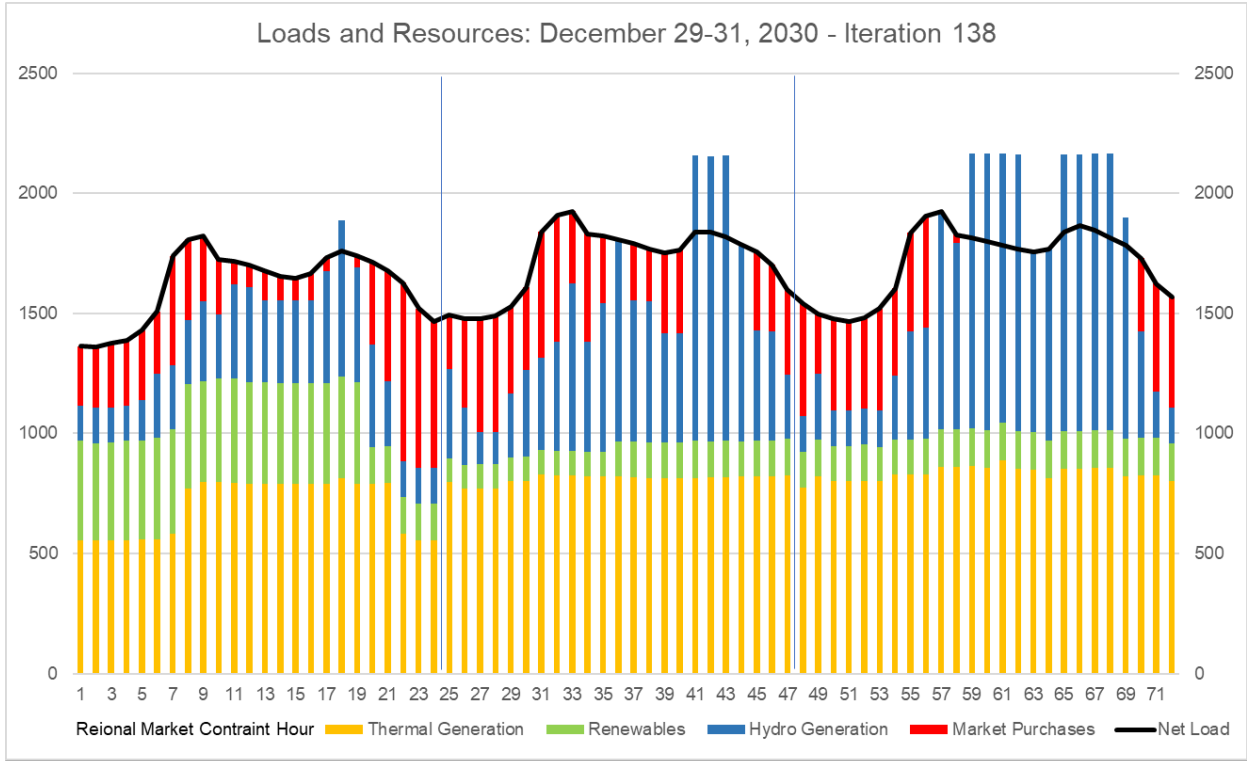
99th Percentile Market Purchases During Regional Market Constrained Conditions

Month \ Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	434	540	588	590	523	529	686	697	500	565	461	423	368	430	501	549	342	251	242	334	467	549	518	615
2	444	566	624	612	528	570	735	644	349	521	241	265	307	380	490	600	348	216	255	322	394	524	491	590
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	514	571	657	677	645	319	224	168	238	319	79	0	0	0	0	0	0	0	0	0	0	448	344	409
7	235	237	273	326	297	214	214	201	203	212	198	193	229	199	116	138	44	39	33	168	222	242	239	308
8	263	296	314	306	269	250	236	250	235	278	304	329	343	305	356	350	246	169	219	273	438	397	375	420
9	173	218	320	456	319	375	445	499	337	512	0	0	0	0	0	0	0	0	0	0	0	337	181	292
10	115	172	200	208	149	229	349	380	126	142	0	0	0	0	0	0	0	0	0	0	0	226	248	463
11	558	607	644	651	648	681	737	735	548	598	549	491	499	555	536	559	549	387	457	480	456	557	537	656
12	461	580	622	641	555	547	654	598	501	612	386	349	431	401	491	467	254	192	278	353	492	562	578	663

Results - 2030

- Constrained regional market





Inputs - 2045

- 1,000 draws of load, hydro, and wind
- Thermal generation represents availability. Thermal dispatched according to market prices and heat rate

Load (aMW)

	Average	Max	Min
Average Load	1,262	1,291	1,242
Winter Peak	2,134	2,219	2,026
Summer Peak	2,052	2,332	1,839

Generation (aMW)

	Average	Max	Min
Annual Hydro	685	790	511
Wind	362	392	332
Coyote Springs 2	96	100	91
New CT Frames	177	183	166
New ICE Units	106	109	100
New Ammonia Units	652	678	614
Kettle Falls	55	56	51
TOTAL	**2,133**	**2,308**	**1,865**

Results 2045

- Market purchases during all hours

Average Market Purchases by Month/Hour

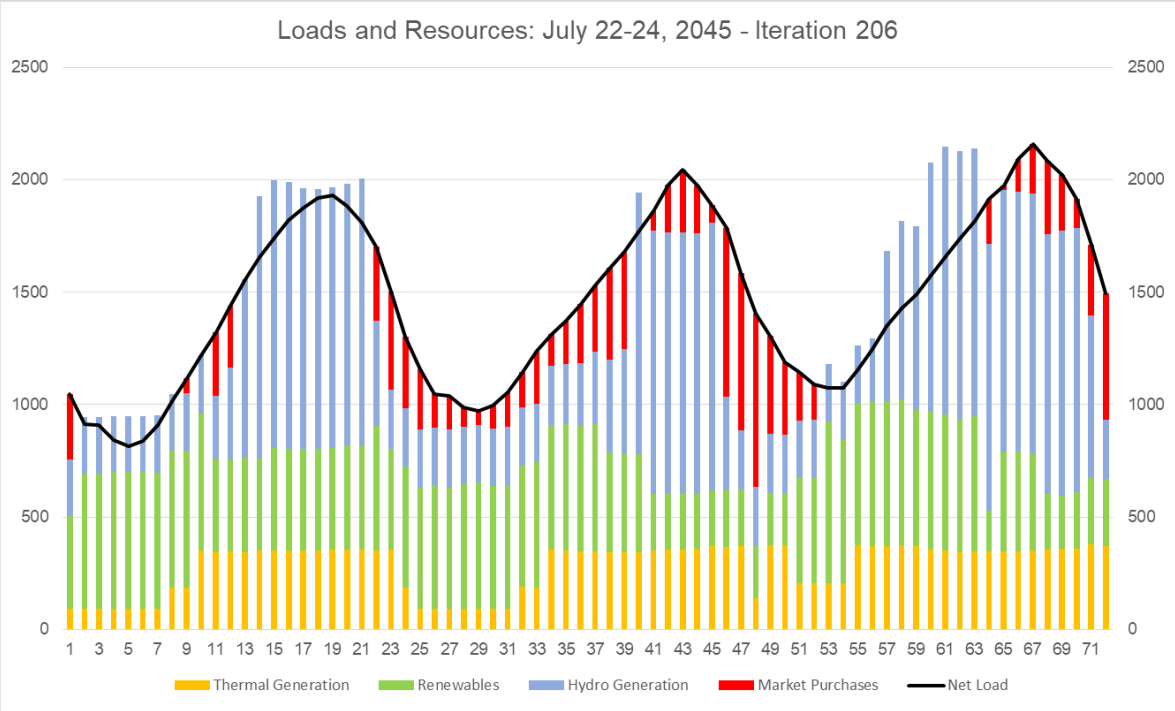
Month \ Hours	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	346	390	386	385	375	382	428	420	399	372	300	253	238	224	212	189	167	177	209	205	202	300	459	482
2	310	348	347	354	336	338	379	364	329	281	203	174	165	153	147	136	112	106	140	144	154	194	388	422
3	214	248	248	254	237	238	268	239	202	169	103	88	76	82	94	72	42	37	53	52	60	118	263	309
4	96	143	152	159	131	112	101	79	64	46	18	10	9	14	17	11	4	1	1	1	3	20	115	173
5	21	45	52	56	40	29	15	9	5	3	1	1	1	0	0	0	0	1	2	1	0	0	17	52
6	26	50	52	55	40	28	17	9	6	4	3	2	1	0	0	1	1	4	8	4	2	1	15	62
7	82	92	89	82	69	58	53	48	51	46	34	34	36	33	29	25	17	30	44	29	31	64	136	168
8	139	138	125	114	106	103	99	96	111	118	115	130	154	160	159	147	83	63	77	90	148	267	282	244
9	90	99	87	84	81	84	99	107	118	117	104	100	107	104	105	97	60	23	23	35	87	188	207	162
10	122	122	116	118	112	134	206	238	232	209	119	86	112	119	122	95	67	35	9	25	77	171	257	204
11	269	268	254	256	262	292	365	374	341	306	226	174	167	154	145	132	90	48	63	92	117	231	386	369
12	384	397	387	387	377	394	444	434	406	362	273	222	208	192	182	174	151	133	160	169	197	270	481	500

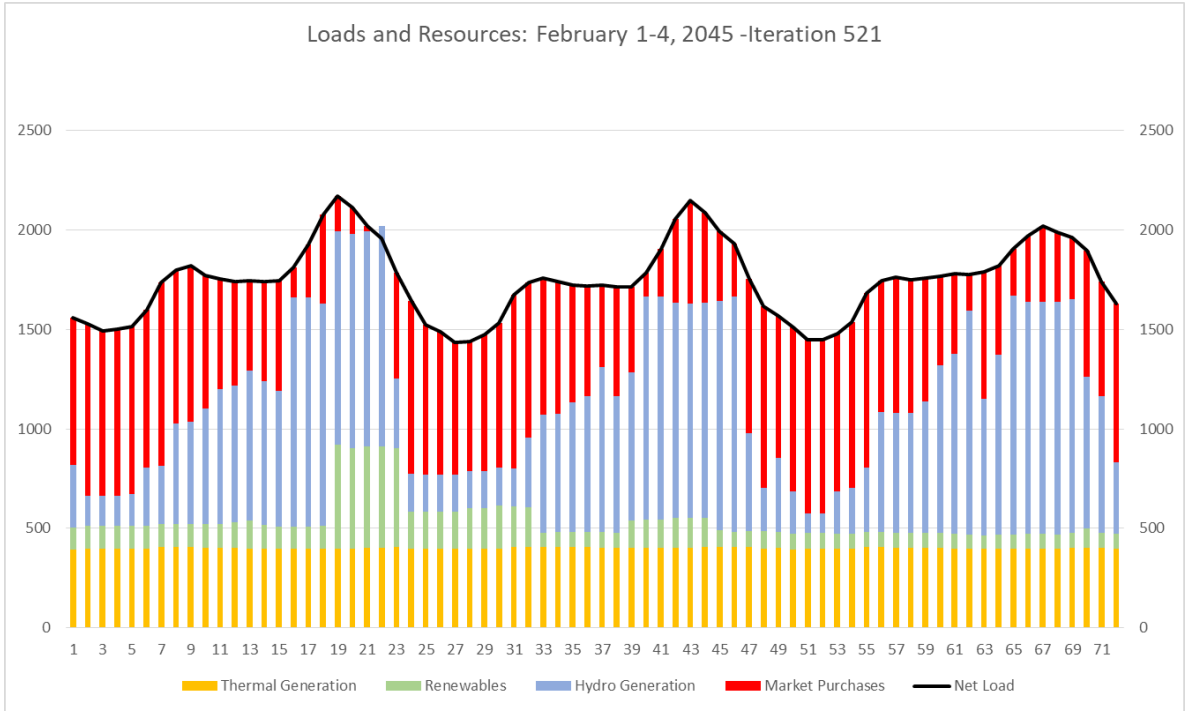
95th Percentile Market Purchases

Month \ Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	663	716	710	710	705	715	768	771	764	746	697	663	643	613	569	472	418	479	516	507	472	728	813	813
2	627	673	671	679	656	656	717	726	698	656	593	556	528	492	474	366	347	386	402	455	442	530	761	750
3	520	566	567	573	546	546	597	597	575	537	423	373	299	327	379	240	164	209	247	253	265	381	616	635
4	321	418	430	446	395	356	323	274	235	183	100	63	55	81	91	74	31	0	0	0	12	137	350	456
5	82	178	222	251	157	103	73	59	38	18	0	0	0	0	0	0	0	0	4	0	0	0	87	179
6	147	235	247	262	203	154	86	61	50	33	15	4	0	0	0	0	1	20	50	22	3	0	100	268
7	311	329	325	313	291	262	239	217	239	233	194	203	205	147	139	143	129	183	229	175	206	315	467	467
8	396	396	379	359	344	343	327	316	343	370	386	424	471	498	524	533	333	297	340	351	525	653	603	533
9	310	333	312	309	305	315	331	342	359	360	348	353	382	381	389	367	217	122	144	172	284	526	484	425
10	376	379	370	376	362	390	486	528	523	501	413	339	395	404	408	328	178	123	49	118	189	485	551	490
11	572	571	562	562	563	597	685	705	678	635	566	511	491	462	426	334	228	227	268	281	289	591	717	682
12	701	715	704	707	697	712	769	772	740	703	645	577	537	489	448	387	403	404	444	467	443	613	816	820

Results 2045

- Market purchases during all hours





Results 2045

- Market purchases during regional market constrained hours

50th Percentile Market Purchases During Regional Market Constrained Conditions

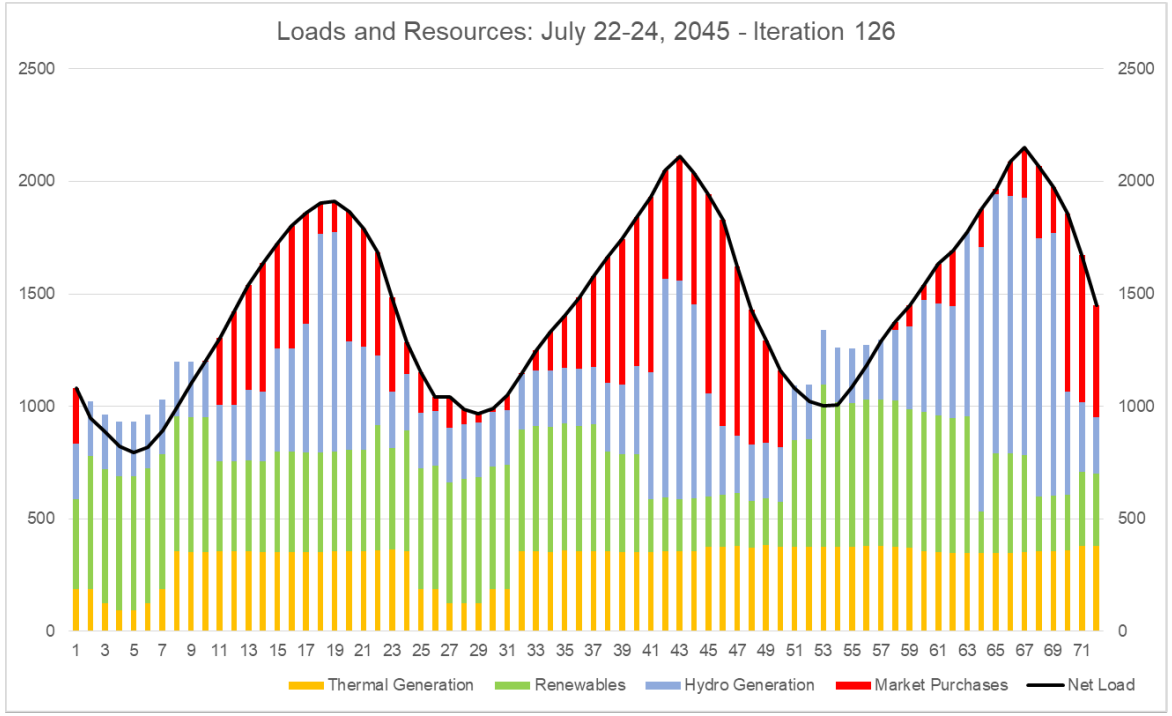
Month \ Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	255	286	302	297	305	338	401	414	390	350	283	275	265	232	209	185	175	184	189	194	209	263	361	389
2	318	246	235	254	258	311	403	388	333	292	279	213	199	190	221	181	140	131	164	165	184	193	238	359
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	401	251	85	87	81	64	216	272	269	203	197	48	19	34	26	28	49	110	165	97	57	62	145	166
7	125	101	102	63	65	61	74	100	126	149	161	222	257	202	109	83	66	103	129	94	57	136	221	209
8	95	81	76	90	65	56	54	64	109	114	131	134	172	186	191	93	75	88	104	73	93	278	303	237
9	104	134	177	199	142	133	223	273	259	292	291	260	284	285	292	327	271	19	111	104	27	520	425	493
10	125	182	363	352	298	311	161	256	77	73	121	105	265	267	257	171	242	79	121	123	350	453	228	298
11	374	378	418	422	458	502	592	553	437	339	187	105	186	142	172	200	136	176	167	143	164	196	442	445
12	343	366	348	354	376	396	440	429	374	321	282	264	221	222	214	232	250	184	216	237	247	288	401	494

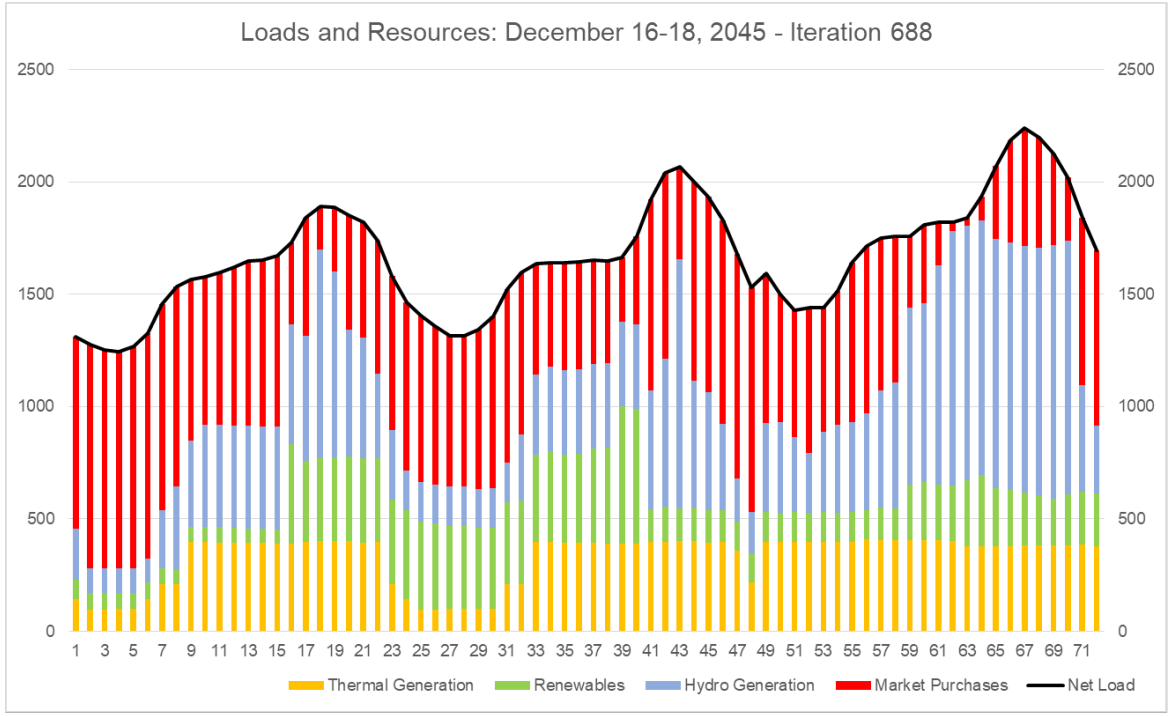
95th Percentile Market Purchases During Regional Market Constrained Conditions

Month \ Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	796	825	843	850	853	891	930	934	937	917	878	842	824	800	771	718	655	636	674	683	719	860	908	919
2	807	833	791	796	777	839	905	892	842	757	839	819	786	743	818	644	431	447	501	487	424	695	823	846
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	527	516	458	504	416	428	380	475	408	244	200	53	79	140	172	256	359	464	517	442	344	248	524	737
7	446	440	430	393	375	337	319	329	389	413	411	436	489	403	309	302	327	384	437	384	329	523	632	601
8	473	424	445	431	394	380	394	408	478	531	584	644	702	757	778	635	492	496	554	535	632	872	809	677
9	533	532	618	645	607	648	675	721	581	605	624	639	814	814	822	862	835	752	482	750	801	887	724	770
10	538	770	825	818	614	655	673	605	758	761	775	718	733	737	752	761	688	626	210	468	912	817	739	859
11	730	746	723	741	796	828	902	902	875	816	724	576	662	623	553	562	441	494	492	451	536	672	903	875
12	801	851	848	843	849	866	886	884	879	872	820	746	690	668	655	593	633	638	657	653	649	788	894	929

Results 2045

- Market purchases during all hours





2023 Portfolio Scenario Analysis

Avista IRP Team
Technical Advisory Committee Meeting No. 9
April 25, 2023

Scenario Overview

1. Preferred Resource Strategy
2. Alternative Lowest Reasonable Cost Portfolio
3. Baseline Portfolio
4. No Resource Additions
5. No CETA/No New Natural Gas Plants
6. WRAP Planning Reserve Margin (PRM)
7. WRAP PRM w/ No Qualifying Capacity Credit (QCC) Changes
8. Variable Energy Resources (VERs) Assigned to Washington
9. Low Economic Growth
10. High Economic Growth
11. High Electric Vehicle Growth
12. WA Space/Water Heat Electrification
13. WA Space/Water Heat Electrification w/ Natural Gas Backup
14. Combined Electrification
15. Clean Portfolio by 2045
16. Social Cost Included for Idaho
17. WA Maximum Benefit Scenario

2. Alternative Lowest Reasonable Cost

Purpose & Assumptions

- Understand financial impact of CETA compliance for Washington
- Used for CETA cost cap calculation
- Assumes SCGHG is included, along with other NEI values for Washington
- Does not assume NCIF or CETA clean energy targets

Results & Comparison to PRS

- WA Costs $7.8 million lower (Levelized)
  - $81 million less in 2045 or 5% lower rates
  - Idaho financial impacts de minimis
- 2045 impact is mostly due to retaining Coyote Springs 2
- Natural Gas CT is selected for WA (247 MW) in exchange for Renewable Fueled CTs
- Storage selection is increased due to model not trying to meet monthly renewable energy targets
- Idaho's portfolio has reductions in Natural Gas CT and increase in energy storage

3. Baseline Portfolio

Purpose & Assumptions

- Represents least cost portfolio to meet customer requirements
  - Does not include CETA goals or SCGHG
  - Non-Energy Impacts (NEI) still included for Washington
- Used to estimate premiums for Avoided Cost Calculations
- Values rate impact of including SCGHG

Results & Comparison to PRS

- WA Costs $13 million lower (levelized)
  - $203 million less in 2045 or 13% lower rates
  - Idaho financial impacts de minimis
- More resources are chosen as a system resources rather than by state
- Natural Gas CT is selected for WA (431 MW) in exchange for Renewable Fueled CTs
  - Wind/Storage significantly lower, but selected
- Idaho's resource selection lowers Natural Gas in exchange for additional energy storage and some wind, demand response is selected

4. No Resource Additions

Purpose & Assumptions

- Used to determine capacity pricing for Avoided Cost Calculation
- Retains PRS's Energy Efficiency results

Results & Comparison to PRS

- Financial and resource selection results are not material other than used for avoided cost estimates
- Power supply cost are derived by 100% reliance on energy market for open positions rather than adding resources

5. No CETA/No New Natural Gas CT

Purpose & Assumptions

- Starts with Baseline portfolio assumptions, but does not allow new natural gas resources to be selected
- The results are used for estimate clean capacity premiums for avoided cost calculation

Results & Comparison to PRS

- Financial and resource selection results are not material other than those used for avoided cost estimates

6. WRAP Planning Reserve Margin

Purpose & Assumptions

- Uses WRAP PRM rather than Avista's PRM

Month	WRAP	2023 IRP
Jan	19.0%	22.0%
Feb	19.9%	22.0%
Mar	26.9%	22.0%
Apr	23.4%	22.0%
May	20.0%	13.0%
Jun	16.5%	13.0%
Jul	10.4%	13.0%
Aug	10.3%	13.0%
Sep	17.9%	13.0%
Oct	19.8%	22.0%
Nov	21.6%	22.0%
Dec	17.7%	22.0%

- Purpose is to understand alternative resource selection with differing PRM

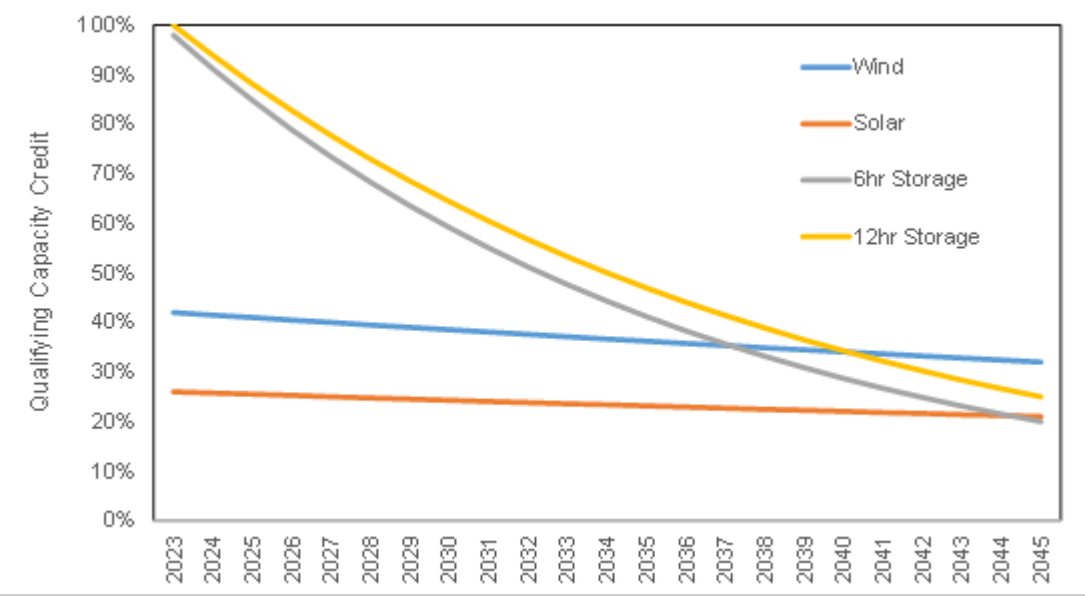
Results & Comparison to PRS

- Overall cost changes are de minimis
  - WA is slightly higher and ID slightly less
- WA resource selection increases wind and energy storage, decreases renewable fuel CT
- ID resource selection marginally increase energy storage and selects demand response
- No material resource selection changes prior to 2032

7. WRAP PRM, but no QCC Reductions

Purpose & Assumptions

- Understand impact of Avista assumption to lower QCC values of VERs, Storage, and demand response



Results & Comparison to PRS

- Total portfolio cost decrease, PVRR is $106 million less, or $9.2 million per year, but savings are after 2034 (less than 1%)
- Insignificant cost changes are likely due to monthly energy targets for both CETA and reliability
- Model tends to select additional wind and storage and less Renewable Fueled CTs for Washington.
- Idaho resource selection lessens natural gas CTs and increases energy storage and demand response

8. VER’s Assigned to Washington

Purpose & Assumptions

- Purpose is to understand resource selection if existing wind/solar only serve the Washington jurisdiction
- Avista does not separate PPA contract costs to protect pricing confidentiality, therefore only system costs are shown

Results & Comparison to PRS

- Total portfolio costs increase by $29 million PVRR, or 0.2%
- Washington’s wind resource need declines by 100 MW, remaining portfolio is similar to PRS
- Idaho’s resource need increases Natural Gas CTs and slightly lessens energy storage

9. Low Economic Growth

Purpose & Assumptions

- Understand resource strategy changes with lower load growth due to less economic expansion

Economic Growth	Average Annual Native Load Growth (%)
Expected Case	0.85
Low Growth	0.53

Results & Comparison to PRS

- PVRR are less due to lower loads, but rates increase 4% higher for both states
- Lower loads do not dilute utility fixed costs, only power supply costs
- Lower loads remove the mid-2030s capacity resource needs in both states
- Washington still requires similar renewable energy resources, but less renewable fueled CTs
- Idaho also needs less Natural Gas CTs, but energy storage slightly increases.

10. High Economic Growth

Purpose & Assumptions

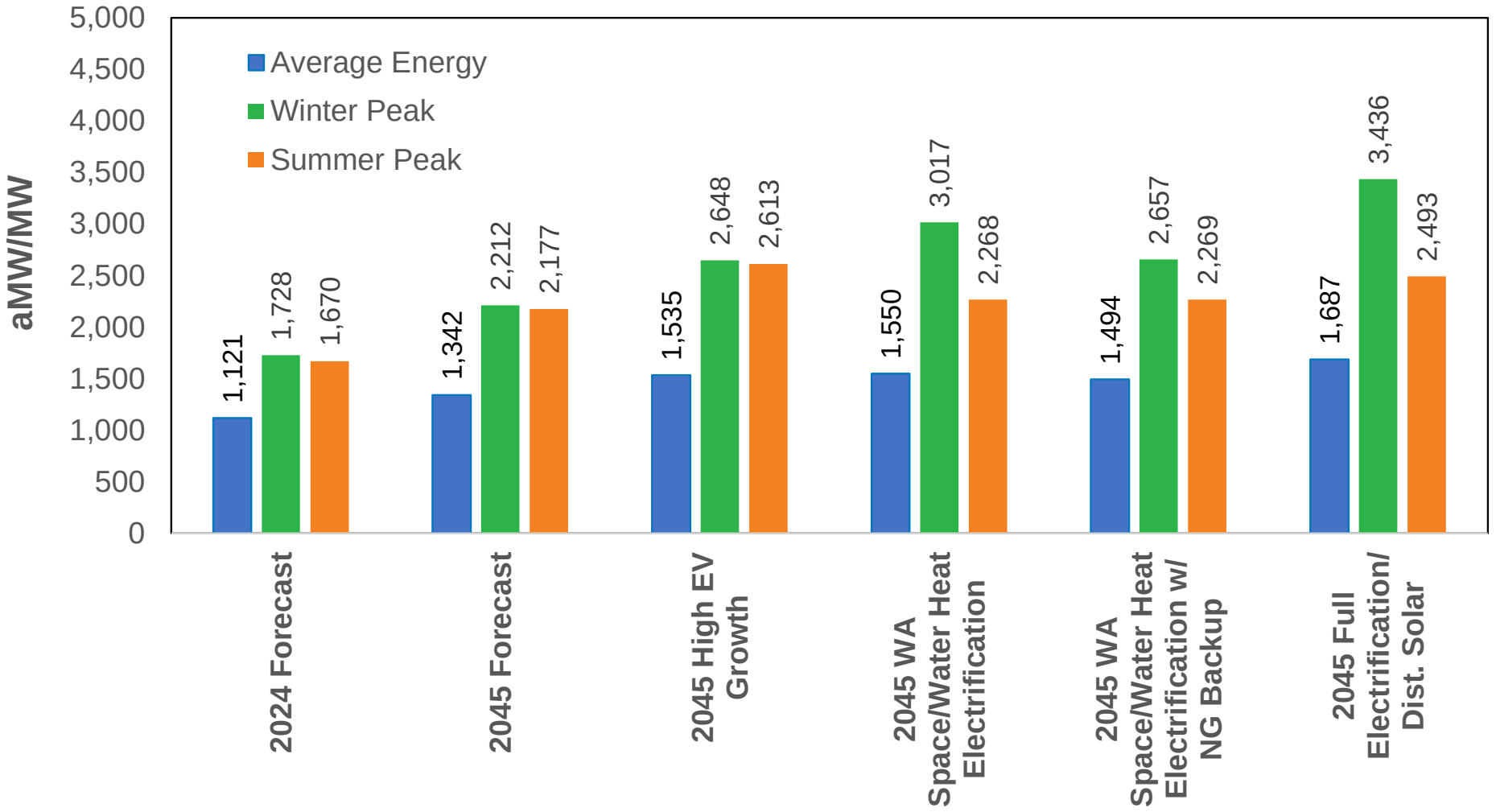
- Understand resource strategy changes with higher load growth due to greater economic expansion

Economic Growth	Average Annual Native Load Growth (%)
Expected Case	0.85
High Growth	1.11

Results & Comparison to PRS

- PVRR are higher due to higher loads, WA rate declines by less then 1% and ID declines by 5%
- Higher loads dilute utility fixed costs, only power supply costs, Idaho benefits from higher loads more then Washington likely due to lower cost resource selection
- Higher growth does not move resource need sooner, just higher capacity requirements later in the study horizon
- Washington will need to increase wind and energy storage, but small amounts of renewable fueled CTs are replaced with geothermal as compared to the PRS
- Idaho requires additional Natural Gas CTs, energy storage, and demand response

Load Forecast Scenario Highlights



11. High Electric Vehicle Growth

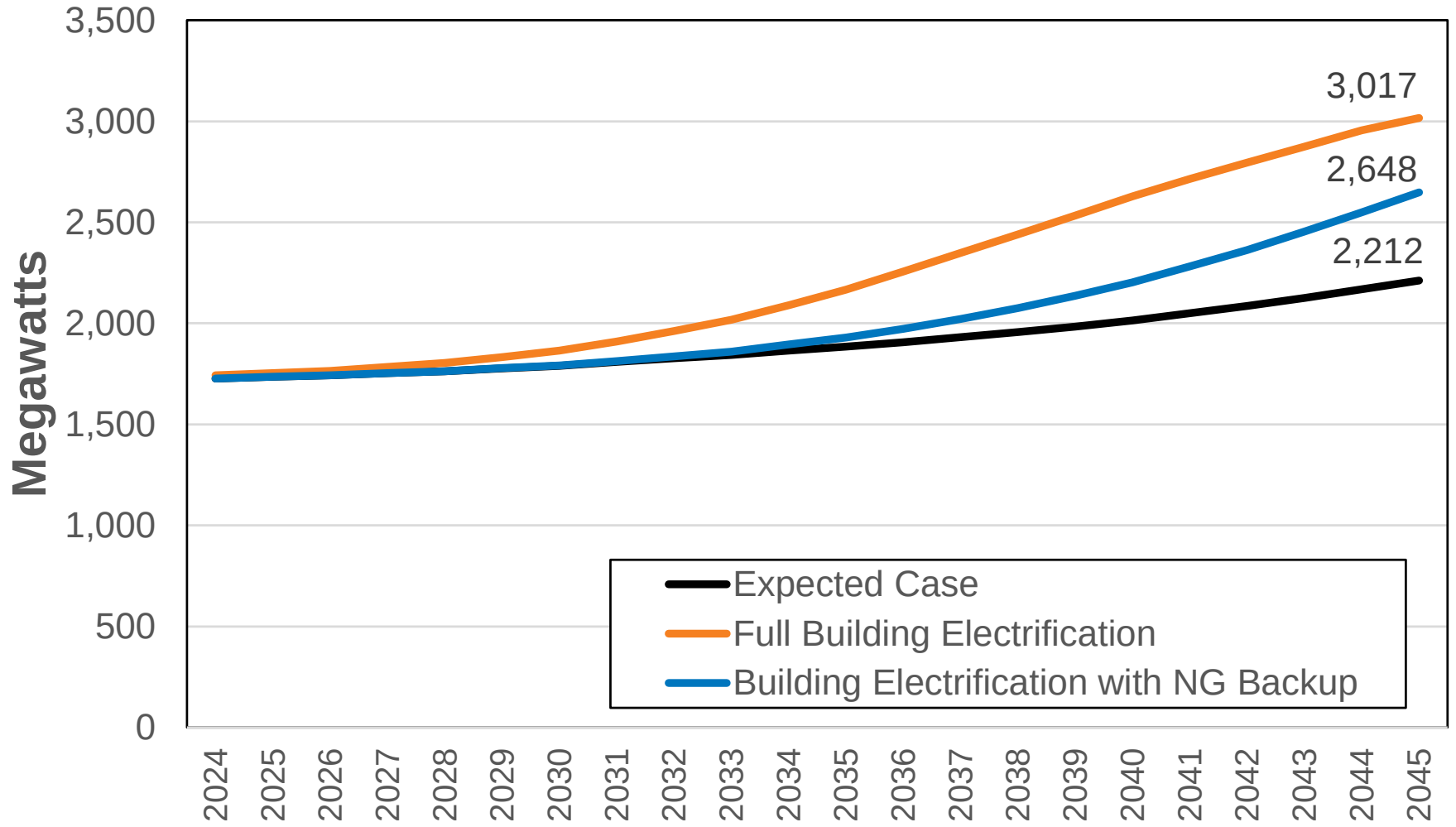
Purpose & Assumptions

- Understand resource strategy implications for electric vehicle growth
- Assumes 100% light duty vehicle sales by 2050 in Washington and 75% in Idaho
- 95% of medium duty vehicle sales are electric by 2040 in Washington and 75% in Idaho load forecast
  - PRS assumes 35% LDV and 15% MDV by 2050

Results & Comparison to PRS

- PVRR cost increases 2.3%
- 2045 rates: WA: 3% reduction, ID: 0.5% increase (results likely due to shift in resource selection for Idaho)
- Does not include T&D costs discussed later
- Washington resource strategy similar to PRS, just higher resource need, with resources needed sooner (mid-2030s)
- Idaho resource selection slightly reduces Natural Gas CTs (-11 MW), but increases energy storage by 94 MW

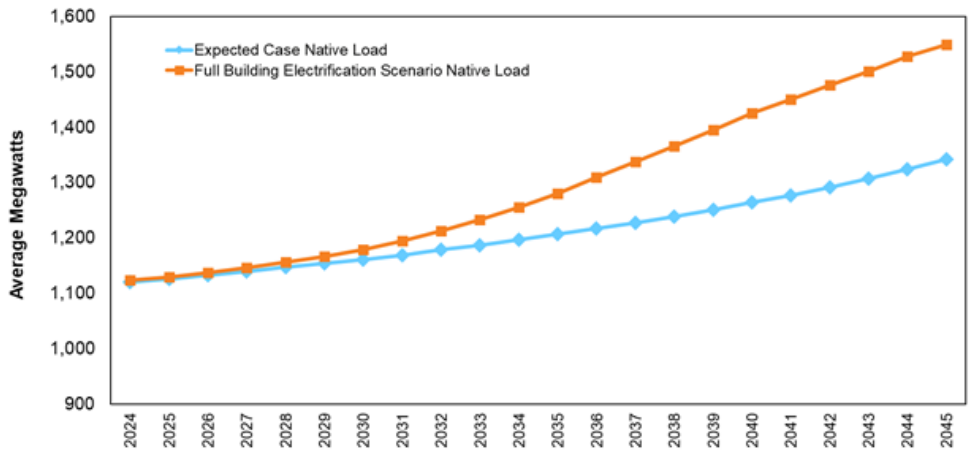
Building Electrification Load Forecasts (Winter Peak)



12. Washington Space/Water Heat Electrification

Purpose & Assumptions

- Understand resource strategy implications for space/water heat electrification
- Assumes gradual shift of existing natural gas customers to electric using a combination of heat pumps/resistance heat with heat pump water heat for Washington customers only



Results & Comparison to PRS

- 2045 Rates: WA 11% higher (13% with all transmission costs)
  - Does not include T&D costs discussed later
  - Idaho could have rate impacts depending on transmission infrastructure cost allocation (rate impact is ~5%)
- Washington resource strategy is similar to PRS, just higher resource need, with resources needed sooner (early 2030s), energy storage has the most significant increase (805 MW)
- Idaho resource selection slightly reduces Natural Gas CTs (-37 MW), but increase energy storage by 68 MW

13. Washington Space/Water Heat Electrification w/ Natural Gas Backup

Purpose & Assumptions

- Assumes space heating with heat pump technology, but shifts to natural gas when temperatures are below 40 degrees for Washington customers
  - Current central heat pump technology limits. Does assume lower temps for limited ductless technology applications
  - Strategy allows for reduction in natural gas usage without stressing winter peak needs as much as full electrification
  - Represents proposed building codes

Results & Comparison to PRS

- 2045 Rates: WA 4% higher
  - Does not include T&D costs discussed later
  - Idaho could have rate impacts depending on transmission infrastructure cost allocation (rate impact is ~5%)
- Washington resource strategy is similar to PRS and #12, but resource selection is between scenarios in resource need
- Idaho resource selection slightly reduces Natural Gas CTs (-32 MW), but increases energy storage by 82 MW

14. Combined Electrification

Purpose & Assumptions

- Assumes highest load potential
  - Combines scenario #11 and #12 load impacts
- Useful in understanding boundaries of load growth for existing customers in extreme electrification efforts

Results & Comparison to PRS

- 2045 Rates: WA 16.5% higher (4 cents/kWh)
  - Does not include T&D costs discussed later
  - Idaho could have rate impacts depending on transmission infrastructure cost allocation (rate impact is ~5%)
- Capacity resources needed by 2032
- Washington resource strategy requires additional wind and energy storage, but also includes nuclear (350 MW) and geothermal (40 MW) and biomass (58 MW) as resource selections
- Idaho resource selection slightly reduces Natural Gas CTs (-21 MW), but increases energy storage by 100 MW

Transmission Estimates (included in IRP modeling)

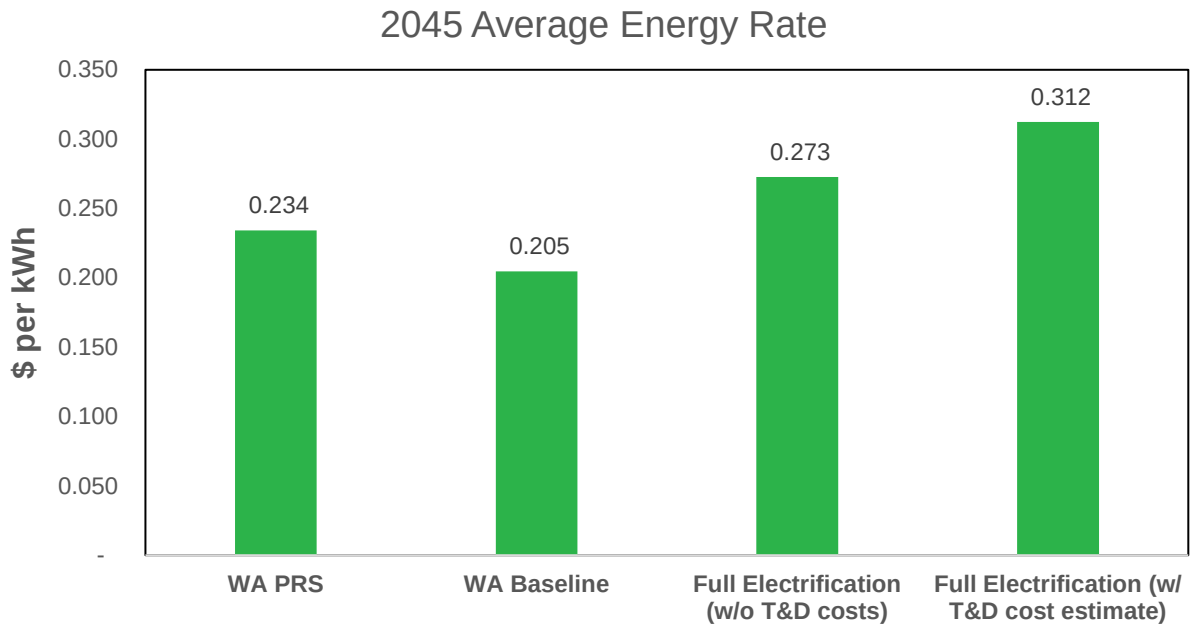
- Resource connection costs from IRP transmission studies from resource selection
  - $304 million (2023$) to be online 2030 to 2045 (PRS $249 million)
- Major transmission improvements for energy delivery
  - North Idaho and Spokane, upgrading Big-Bend area for wind integration, import connection with BPA and others, plus 3rd party upgrades to interconnect off-system generation
    - $715 million (2023$) to be online by 2040-2045 (PRS $250 million)
- 3rd party transmission wheeling
  - $62 million ($32 million PRS)
- Current net book value is $0.7 billion

Customer Delivery Costs (T&D Investments)

- Electrification Portfolio's require new T&D investments
- At this time only Portfolio #14 is being estimated
- These estimates require additional analysis and are based on preliminary estimates without conducting detained engineering analysis
  - Further analysis will need to be completed as part of Distribution Planning Advisory Group (DPAG)
- 1,450 MW of delivery capability (include 1-20 winter weather event) mostly in urban/suburban areas
- 75% of system is likely to require upgrades
- 36 new distribution substations by splitting up existing feeders (create 145 new feeders
- 6 new 230/115 kV switching stations
- 32,000 new service transformers
- 163 miles of distribution lines
- 72 miles of 115kV, 30 miles of 230 kV
- 1,900 miles customer conductor
- 46 FTE support staff (not including engineers/crew to construct infrastructure)

Preliminary Cost and Impacts

- Total cost in 2023$ is $1.9 billion ($3.3 billion nominal cost)
- Estimates used per substation is $57 million
- For this estimate additional upgrades begin in 2028 and escalate through 2045
- With inflation, customer revenue requirement is $2.2 billion for these investments (present value) when amortized over 50 years
- As a comparison: current net book of WA distribution assets is ~$1 billion



15. Clean Portfolio by 2045

Purpose & Assumptions

- Assumes Avista retires all natural gas resources by 2045
- Resource additions are only renewable or not emitting for both states

Results & Comparison to PRS

- 2045 Rates: WA 2.6% higher, Idaho 40% higher (+7.4 cents) compared to PRS
- Idaho's new resource portfolio would require 236 MW of wind, 378 MW renewable fueled CTs, 90 MW of DR/energy storage, and geothermal
- Idaho's resource selection moves up to 2032 vs. 2034
- Washington's portfolio as compared to the PRS is largely unchanged
- Idaho's share of greenhouse gas emissions fall by 717,000 metric tons in 2045

16. Social Cost Included For Idaho

Purpose & Assumptions

- Determines if Idaho's resource selection changes if NEI and SCGHG costs are included for the Idaho resource selection
- Result of concern by a customer in the IRP public meeting
- Indirectly demonstrates the premium of CETA over the social cost/benefit in Washington

Results & Comparison to PRS

- Resources for Idaho do change
  - 100 MW less natural gas CT
  - 31 MW less energy storage
  - 116 MW added Renewable Fueled CT
  - 20 MW added geothermal
- Idaho 2045 rate is 1.8% higher
- Washington resources and costs are largely unchanged but demonstrates a 25% premium in cost of CETA vs. using only social cost of resource decisions

17. Washington Maximum Customer Benefits

Purpose & Assumptions

- Washington state required scenario used to understand cost/benefits of increasing customer benefit indicators.
- Portfolio is designed to achieve the following goals:
  - Select resources either within Washington or connected to Avista's system
  - Reduce air emissions (i.e., NOx)
  - Increase investment in name communities for energy bill offsets
  - No nuclear
- Further discussion and design will be discussed in the 2025 IRP

Results & Comparison to PRS

- Increases solar by 817 MW with 676 MW directly benefiting low-income customers to reduce energy burden from $2,045 per year to $632 per year
- 228 MW of hydrogen fuel cells
- 591 MW of energy storage (long-duration)
- Reduction of 100 MW of wind capacity
- 40 MW of geothermal (not restricted, but may not meet proximity requirement)
- Costs of this scenario increase average energy rates in 2045 by 29% or 6.8 cents per kWh

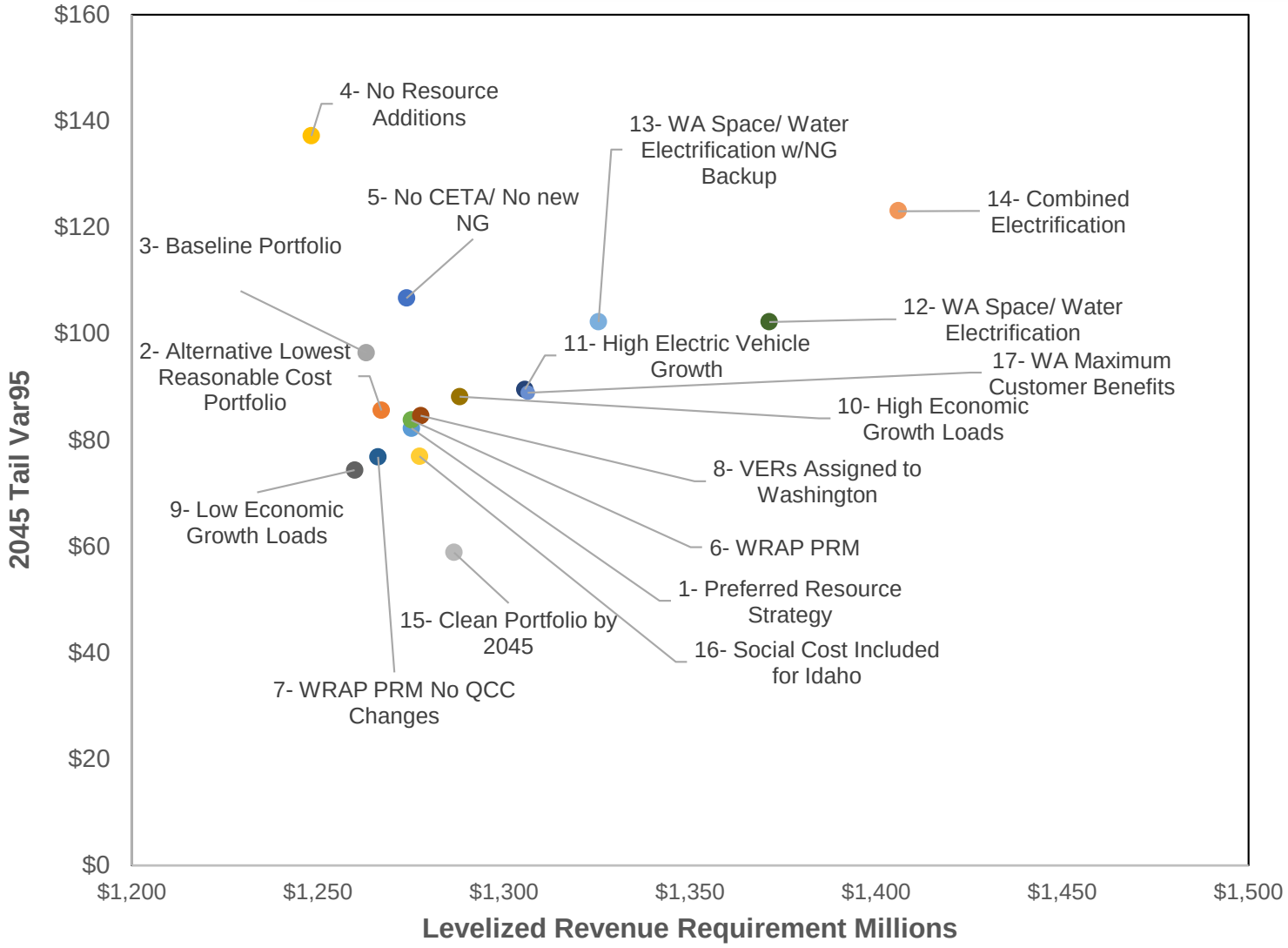
Scenarios

	1- Preferred Resource Strategy	2- Alternative Lowest Reasonable Cost Portfolio	3- Baseline Portfolio	4- No Resource Additions	5- No CETA/ No new NG	6- WRAP PRM	7- WRAP PRM No QCC Changes	8- VERs Assigned to Washington	9- Low Economic Growth Loads	10- High Economic Growth Loads	11- High Electric Vehicle Growth	12- WA Space/ Water Electrification	13- WA Space/ Water Electrification w/NG Backup	14- Combined Electrification	15- Clean Portfolio by 2045	16- Social Cost Included for Idaho	17- WA Maximum Customer Benefits
Washington																	
NG CT	0	247	431	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solar	10	51	0	0	0	11	11	11	10	11	97	11	161	11	10	84	827
Storage Added to Solar	0	25	0	0	0	1	0	0	1	1	0	0	1	0	1	37	1
Wind	945	843	364	0	400	1,028	1,145	845	905	1,045	1,245	1,545	1,345	1,545	1,009	905	845
Storage	130	494	265	0	795	365	454	125	298	209	492	935	569	1,231	91	123	591
Hydrogen/Ammonia	696	88	0	0	79	578	312	682	366	646	707	890	767	712	704	682	228
Other "Clean" Baseload	0	0	0	0	0	20	78	20	98	20	98	98	98	447	33	20	40
Existing Plant Upgrades	0	0	3	0	0	6	6	0	3	3	0	0	0	3	0	0	3
DR Capability	7	7	7	0	7	7	7	7	7	7	7	7	7	7	7	7	7
EE- Winter Capacity	57	57	57	57	55	57	57	57	57	57	57	57	57	58	57	57	58
EE- Summer Capacity	59	60	59	59	59	60	59	59	59	59	59	60	60	60	59	59	60
Idaho																	
NG CT	304	264	164	0	0	302	278	318	229	349	293	267	272	283	0	203	271
Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Added to Solar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wind	0	0	36	0	0	0	0	0	0	0	0	0	0	0	236	0	0
Storage	67	89	176	0	350	87	126	42	77	112	161	135	149	167	18	36	85
Hydrogen/Ammonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	377	115	0
Other "Clean" Baseload	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	20	0
Existing Plant Upgrades	0	0	2	0	0	4	4	0	2	2	0	0	0	2	0	0	2
DR Capability	0	0	11	0	0	0	5	0	0	7	0	0	0	0	7	0	0
EE- Winter Capacity	24	25	24	24	22	24	24	24	24	24	24	24	26	26	27	24	24
EE- Summer Capacity	24	26	24	24	21	26	26	24	24	24	25	24	25	26	28	26	24

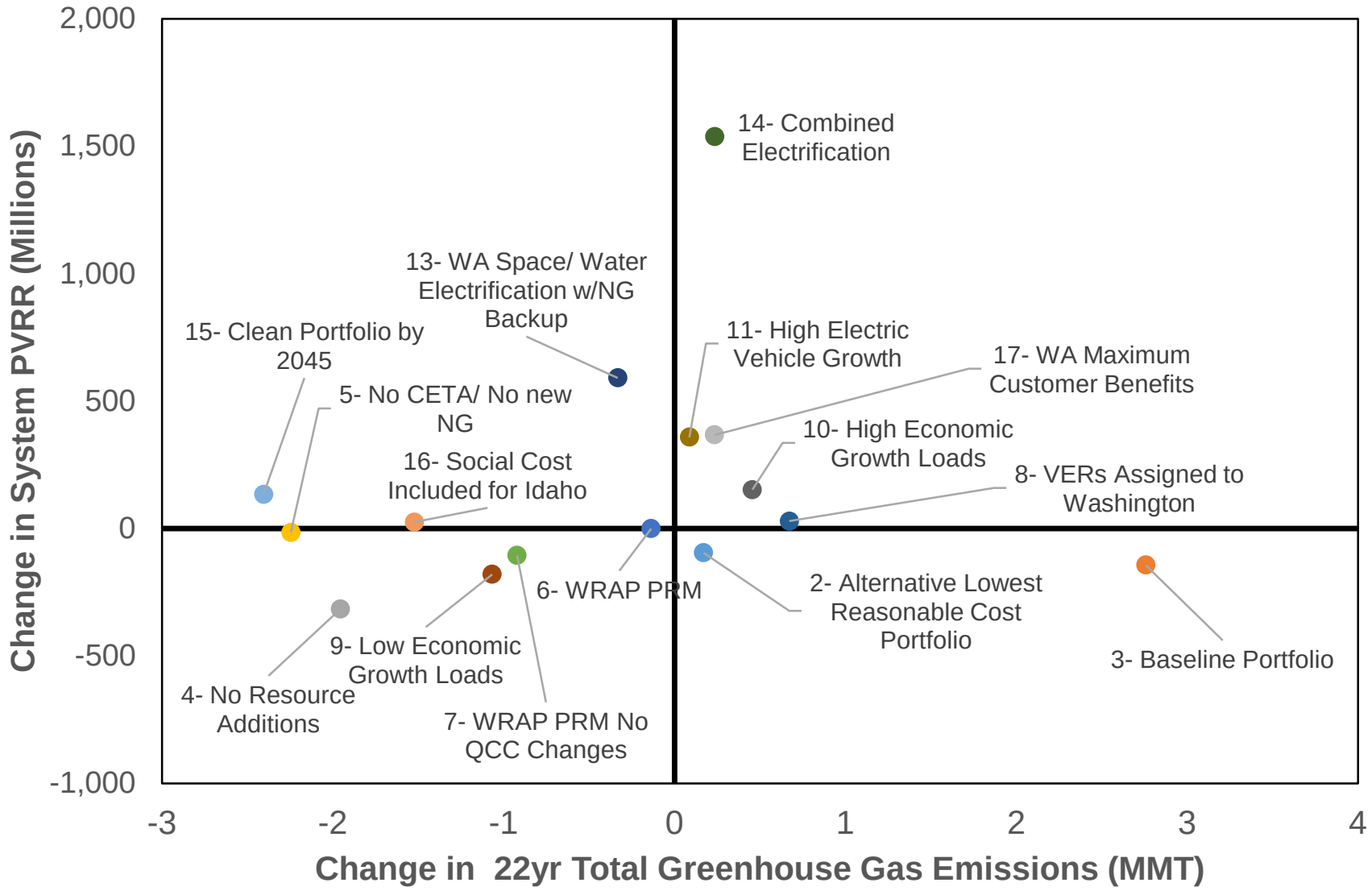
Portfolio Cost & Rate Impacts

Scenario	WA- PVRR ($ Mill)	ID-PVRR ($ Mill)	TOTAL PVRR ($ Mill)	WA 2030 Rate ($/kWh)	WA 2045 Rate ($/kWh)	ID 2030 Rate ($/kWh)	ID 2045 Rate ($/kWh)
1- Preferred Resource Strategy	10,213	4,783	14,996	0.133	0.234	0.119	0.185
2- Alternative Lowest Reasonable Cost Portfolio	10,122	4,778	14,900	0.132	0.222	0.119	0.181
3- Baseline Portfolio	10,064	4,789	14,852	0.133	0.205	0.119	0.184
4- No Resource Additions	9,966	4,713	14,679	0.133	0.194	0.119	0.169
5- No CETA/ No new NG	10,158	4,821	14,980	0.133	0.223	0.119	0.188
6- WRAP PRM	10,217	4,778	14,995	0.133	0.242	0.119	0.186
7- WRAP PRM No QCC Changes	10,126	4,763	14,889	0.133	0.233	0.119	0.179
8- VERs Assigned to Washington	10,205	4,819	15,024	0.133	0.234	0.120	0.184
9- Low Economic Growth Loads	10,119	4,697	14,816	0.134	0.243	0.120	0.192
10- High Economic Growth Loads	10,279	4,868	15,148	0.132	0.233	0.117	0.176
11- High Electric Vehicle Growth	10,541	4,812	15,354	0.133	0.227	0.119	0.186
12- WA Space/ Water Electrification	11,283	4,843	16,126	0.131	0.259	0.119	0.195
13- WA Space/ Water Electrification w/NG Backup	10,787	4,800	15,586	0.132	0.244	0.119	0.194
14- Combined Electrification	11,655	4,879	16,533	0.131	0.273	0.119	0.195
15- Clean Portfolio by 2045	10,227	4,902	15,130	0.133	0.240	0.119	0.259
16- Social Cost Included for Idaho	10,219	4,801	15,021	0.133	0.235	0.118	0.188
17- WA Maximum Customer Benefits	10,594	4,769	15,363	0.134	0.302	0.119	0.182

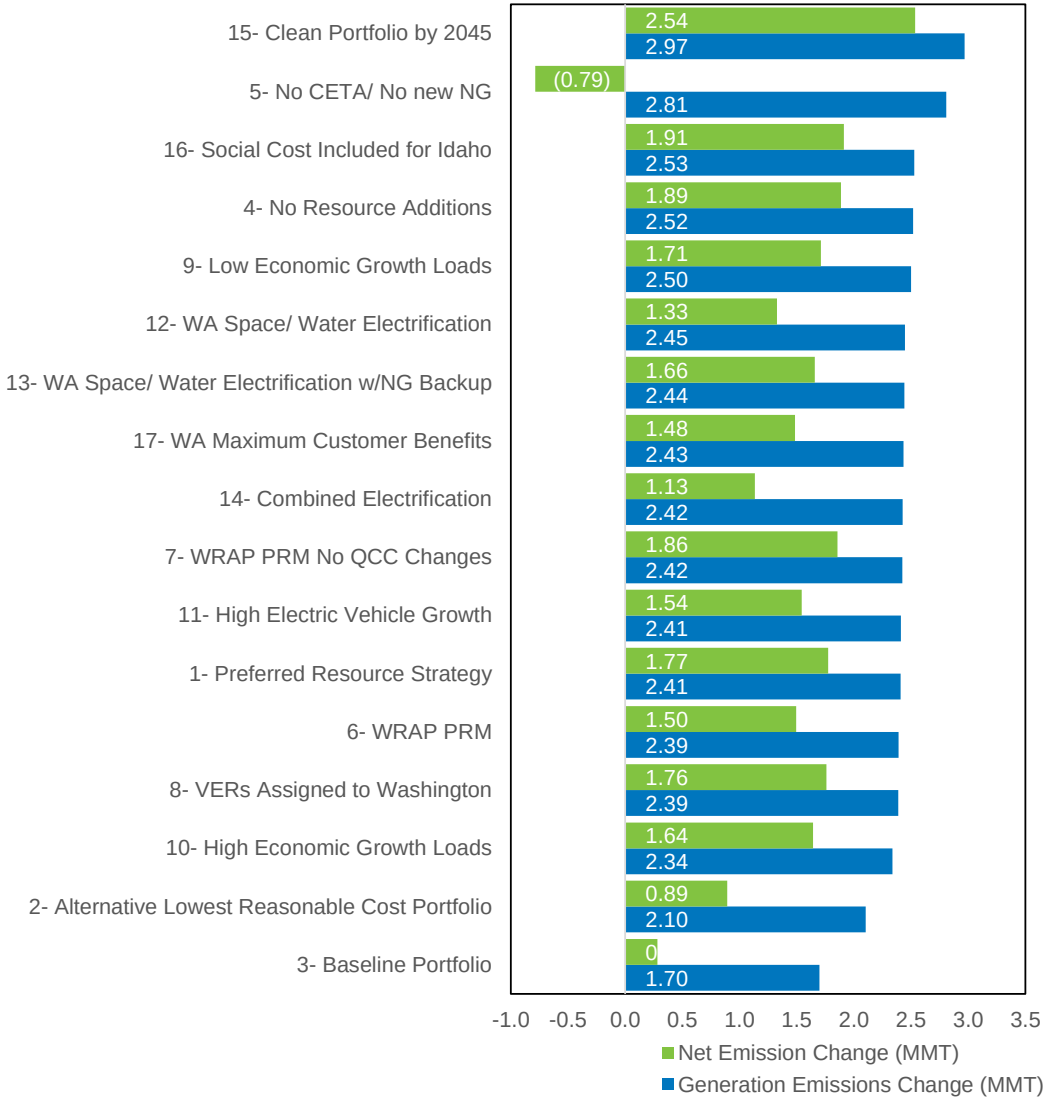
Portfolio Cost vs. Risk



Greenhouse Gas and Cost Comparison to PRS



Greenhouse Gas Emission Savings



2045 Greenhouse Emission Savings for Electrification

Transportation:
PRS: 1.7 million tonnes
High EV Scenario: 3.7 million tonnes

Natural Gas (assumes 75% of NG IRP)
Full electrification: up to 730,000 tonnes
w/ NG backup: 118,000 tonnes

Market Pricing Sensitivities

Percent Change Compared to Expected Case Market Price Forecast

	Change in PVRR vs Expected Case Market Pricing				Change in Levelized GHG MT vs Expected Case Market Pricing		
Portfolio	High NG Prices	Low NG Prices	National GHG Price		High NG Prices	Low NG Prices	National GHG Price
1- Preferred Resource Strategy	1.8%	-3.1%	-0.1%		-11%	6%	-9%
3- Baseline Portfolio	2.1%	-3.3%	0.0%		-12%	7%	-11%
15- Clean Portfolio by 2045	1.6%	-2.9%	-0.1%		-9%	6%	-8%
	Change in PVRR vs PRS				Change in Levelized GHG MT vs PRS		
Portfolio	High NG Prices	Low NG Prices	National GHG Price		High NG Prices	Low NG Prices	National GHG Price
3- Baseline Portfolio	-0.6%	-1.1%	-0.8%		4%	7%	4%
15- Clean Portfolio by 2045	0.6%	1.0%	0.8%		-4%	-6%	-4%

Jurisdictional Cost Changes Compared to Expected Case Market Price Forecast

	Change in PVRR vs Expected Case Market Pricing					
	Washington			Idaho		
Portfolio	High NG Prices	Low NG Prices	National GHG Price	High NG Prices	Low NG Prices	National GHG Price
1- Preferred Resource Strategy	1.2%	-2.7%	-0.2%	3.3%	-4.0%	0.1%
3- Baseline Portfolio	1.8%	-3.1%	-0.1%	2.8%	-3.8%	0.0%
15- Clean Portfolio by 2045	1.3%	-2.7%	-0.2%	2.3%	-3.4%	0.0%

Action Items for 2025 IRP

Avista IRP Team
Technical Advisory Committee Meeting No. 9
April 25, 2023

2023 Action Items

1. Incorporate the results of the DER potential study where appropriate for resource planning and load forecasting.

2. Finalize the Variable Energy Resource (VER) study. This study outlines the required reserves and cost of this energy type. Results of this study will be available for use in the 2025 IRP.

3. Study alternative load forecasting methods, including end use load forecast considering future customer decisions on electrification. Avista expects this Action Item will require the help of a third-party. Further, studies shall continue the range in potential outcomes.

4. Investigate the potential use of PLEXOS for portfolio optimization, transmission, and resource valuation in future IRPs.

2023 Action Items (Continued)

5. Continue to work with the Western Power Pool's WRAP process to develop both Qualifying Capacity Credits (QCC) and Planning Reserve Margins (PRM) for use in resource planning.

6. Evaluate long-duration storage opportunities and technologies, including pumped hydro, iron-oxide, hydrogen, ammonia storage, and any other promising technology.

7. Determine if we can estimate energy efficiency for Named Communities versus low-income.

8. Study transmission access required to access energy markets as surplus clean energy resources are developed.

Remaining Tasks for 2023 IRP

- How can TAC members help
  - Request areas to clarify
  - Analysis that should be conducted
  - Opinions of the plan- provide comments before its filed
  - Additional action items
- Planned work
  - Update market risk section
  - Document clean up
  - Provide more analysis on electrification impacts

Filing Plan

- File with state commissions on June 1, 2023.
- Document and Appendices will be available online
  – including data and models.
- Printed copies available upon request.