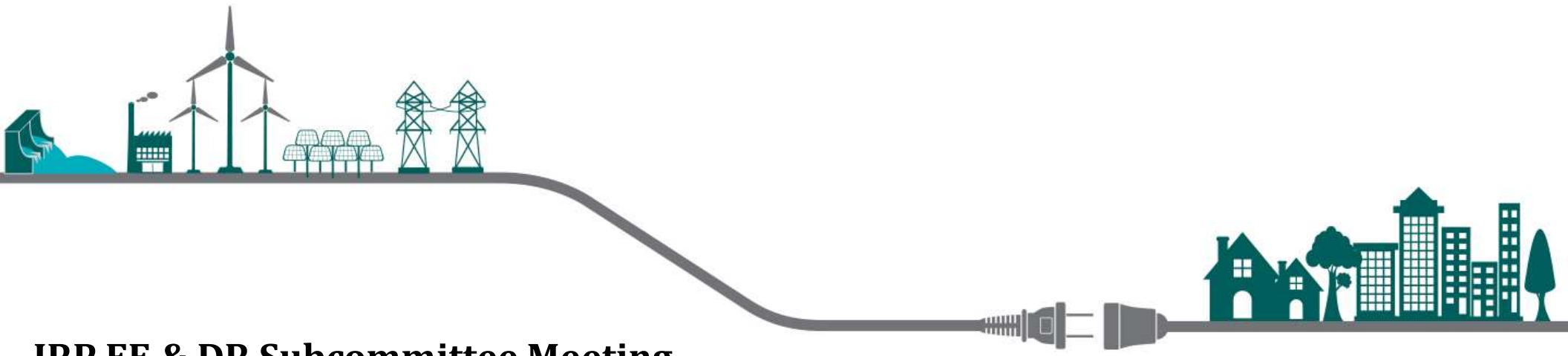
Energy Efficiency & Demand Response for the 2025 IRP



IRP EE & DR Subcommittee Meeting

Quentin Nesbitt

August 29, 2024

Agenda

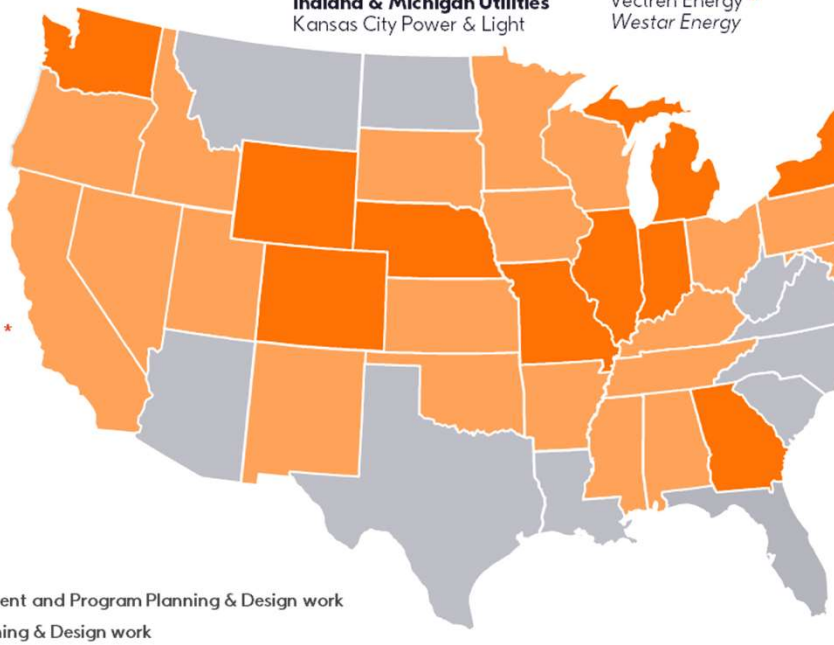
- ✓ Review results of Energy Efficiency (EE) potential study
- ✓ Review how utilized in Load Forecast & IRP
- ✓ Review plans for analysis of extra EE Potential that did not pass cost effective screening
- ✓ Review plans for modeling DR in the IRP

Potential Study Purpose

- The two primary objectives for the potential study is:
  - **Program Planning:** provide insights into possible measures or programs
  - **IRP:** forecast of potential for use in the IRP
- AEG (Idaho Power consultant) used its comprehensive analytical models customized to Idaho Power's service area.

Applied Energy Group

3rd Party Contractor



West:
Avista Energy *
BPA *
Cascade Natural Gas *
Chelan PUD
Cheyenne LFP *
Colorado Electric *
Cowlitz PUD *
HECO
Idaho Power *
Inland P&L *
LADWP
NV Energy
Oregon Trail EC
PacifiCorp *
PNGC
PG&E *
Portland General Electric
Public Service New Mexico *
Seattle City Light *
State of Hawaii *
State of New Mexico
Tacoma Power *
Xcel/SPS

Midwest:
Ameren Illinois *
Ameren Missouri *
Black Hills Power *
Citizens Energy
Empire District Electric *
Indianapolis P&L*
Indiana & Michigan Utilities
Kansas City Power & Light
MERC
NIPSCO *
Omaha Public Power District *
Peoples' Gas/ North Shore Gas *
Spire Missouri
State of Michigan
Sunflower Electric
Vectren Energy *
Westar Energy

Regional & National:
Midcontinent ISO *
EEI/IEE *
EPRI
FERC

Northeast:
Berkshire Gas
Central Hudson G&E *
Con Edison of NY *
Efficiency Maine *
Liberty Utilities *
New Jersey BPU
Orange & Rockland *
PECO Energy
PSEG Long Island
Rockland Electric
Unitil

South:
Kentucky Power *
OG&E
Southern Company / Georgia Power
Spire Mississippi
State of Maryland – EmPOWER *
TVA

Key

* Two or more studies

Bold = Both Market Assessment and Program Planning & Design work

Italics = Only Program Planning & Design work

As of January 2022

- Sixty potential studies in the last 5 years; many of these in the Pacific Northwest

EE Potential Study Purpose

Preferred Portfolio (MW)													
Year	Coal Exits	Gas	H2	Wind	Solar	4Hr	8Hr	100Hr	Trans.	Geo	DR	EE Forecast	EE Bundles
2024	-357	357	0	0	100	96	0	0	0	0	0	17	0
2025	0	0	0	0	200	227	0	0	0	0	0	18	0
2026	-134	261	0	0	100	0	0	0	Jul B2H	0	0	19	0
2027	0	0	0	400	375	5	0	0	0	0	0	20	0
2028	0	0	0	400	150	5	0	0	0	0	0	21	0
2029	0	0	0	400	0	5	0	0	GWW1	0	20	22	0
2030	-350	350	0	100	500	155	0	0	0	30	0	21	0
2031	0	0	0	400	400	5	0	0	GWW2	0	0	21	0
2032	0	0	0	100	100	205	0	0	0	0	0	20	0
2033	0	0	0	0	0	105	0	0	0	0	20	20	0
2034	0	0	0	0	0	5	0	0	0	0	40	19	0
2035	0	0	0	0	0	5	0	0	0	0	40	18	0
2036	0	0	0	0	0	5	0	0	0	0	40	17	0
2037	0	0	0	0	0	55	50	0	0	0	0	17	0
2038	0	-706	340	0	0	155	50	200	0	0	0	17	0
2039	0	0	0	0	0	5	50	0	0	0	0	15	0
2040	0	0	0	0	400	5	0	0	GWW3	0	0	14	0
2041	0	0	0	0	200	5	0	0	0	0	0	14	0
2042	0	0	0	0	200	55	0	0	0	0	0	14	0
2043	0	0	0	0	600	0	0	0	0	0	0	14	0
Sub Total	-841	261	340	1,800	3,325	1,103	150	200		30	160	360	0

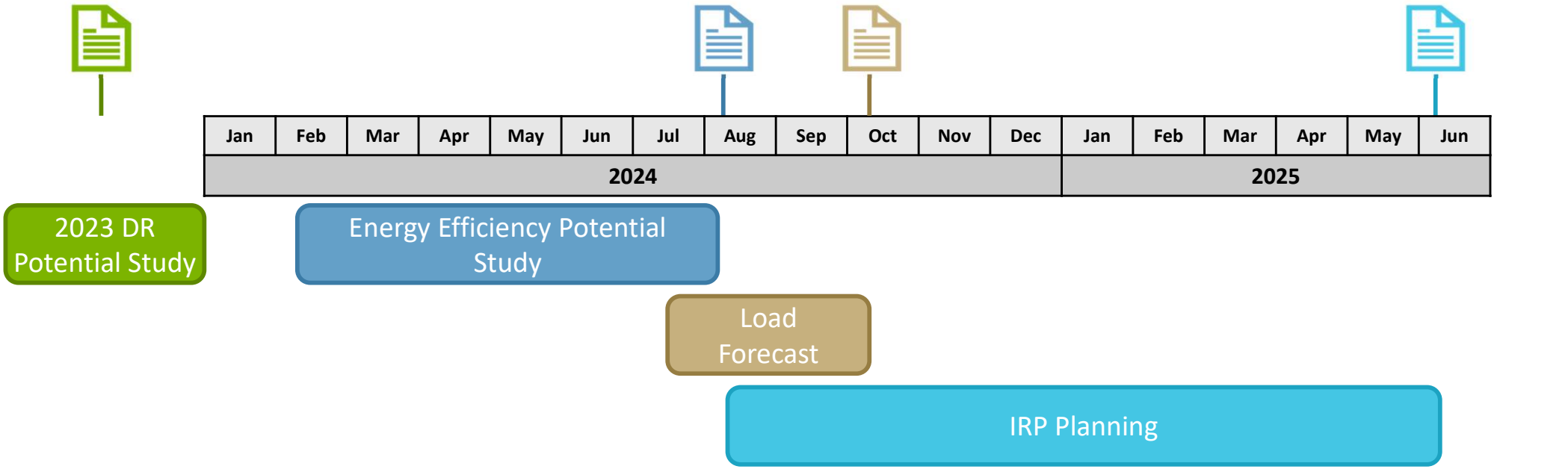
EE reduced from Load Forecast

Extra EE evaluation

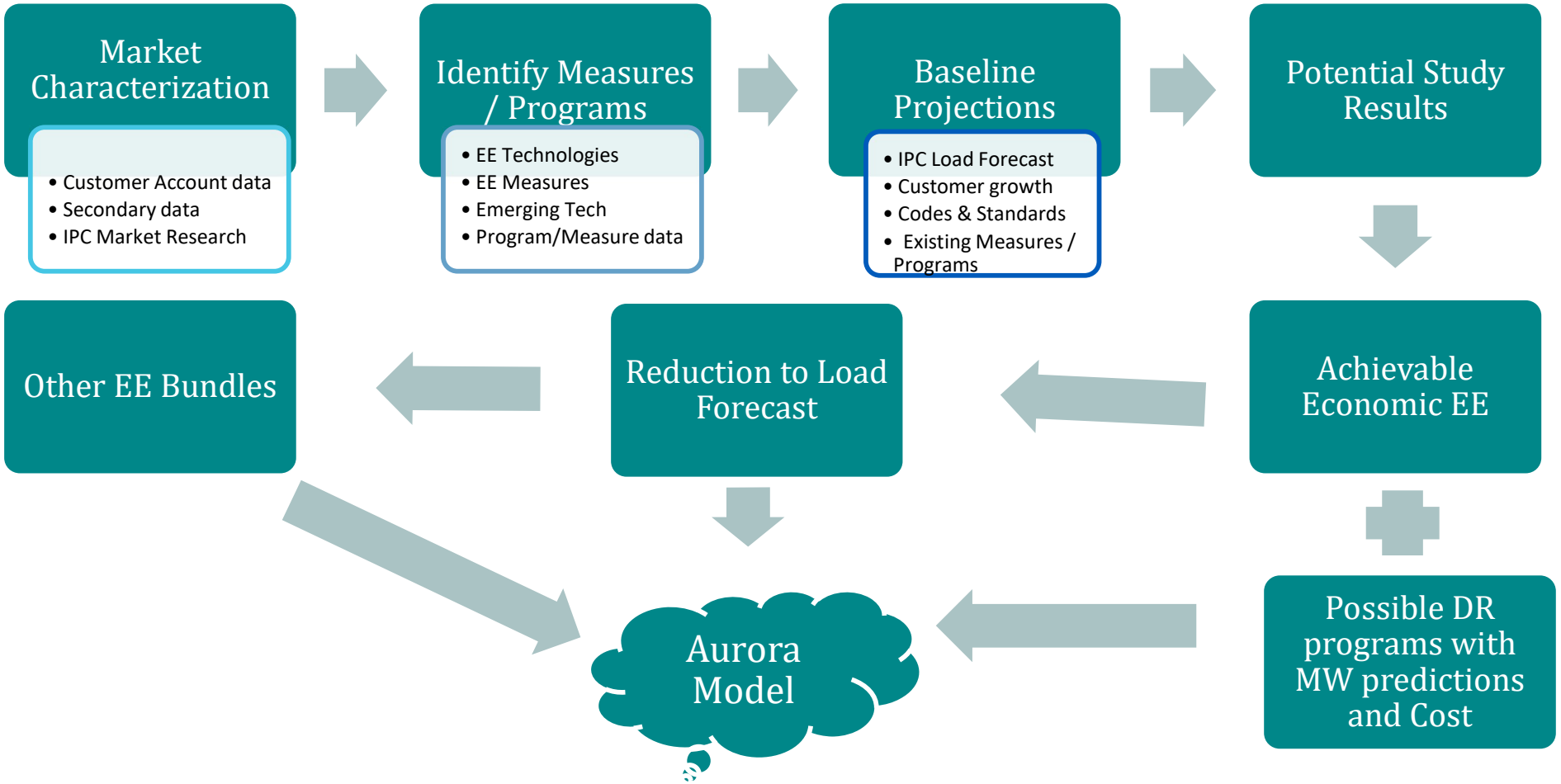
EE Potential Study Purpose

Preferred Portfolio (MW)													
Year	Coal Exits	Gas	H2	Wind	Solar	4Hr	8Hr	100Hr	Trans.	Geo	DR	EE Forecast	EE Bundles
2024	-357	357	0	0	100	96	0	0	0	0	0	17	0
2025	0	0	0	0	200	227	0	0	0	0	0	18	0
2026	-134	261	0	0	100	0	0	0	Jul B2H	0	0	19	0
2027	0	0	0	400	375	5	0	0	0	0	0	20	0
2028	0	0	0	400	150	5	0	0	0	0	0	21	0
2029	0	0	0	400	0	5	0	0	GWW1	0	20	22	0
2030	-350	350	0	100	500	155	0	0	0	30	0	21	0
2031	0	0	0	400	400	5	0	0	GWW2	0	0	21	0
2032	0	0	0	100	100	205	0	0	0	0	0	20	0
2033	0	0	0	0	0	105	0	0	0	0	20	20	0
2034	0	0	0	0	0	5	0	0	0	0	40	19	0
2035	0	0	0	0	0	5	0	0	0	0	40	18	0
2036	0	0	0	0	0	5	0	0	0	0	40	17	0
2037	0	0	0	0	0	55	50	0	0	0	0	17	0
2038	0	-706	340	0	0	155	50	200	0	0	0	17	0
2039	0	0	0	0	0	5	50	0	0	0	0	15	0
2040	0	0	0	0	400	5	0	0	GWW3	0	0	14	0
2041	0	0	0	0	200	5	0	0	0	0	0	14	0
2042	0	0	0	0	200	55	0	0	0	0	0	14	0
2043	0	0	0	0	600	0	0	0	0	0	0	14	0
Sub Total	-841	261	340	1,800	3,325	1,103	150	200		30	160	360	0

IRP Timeline



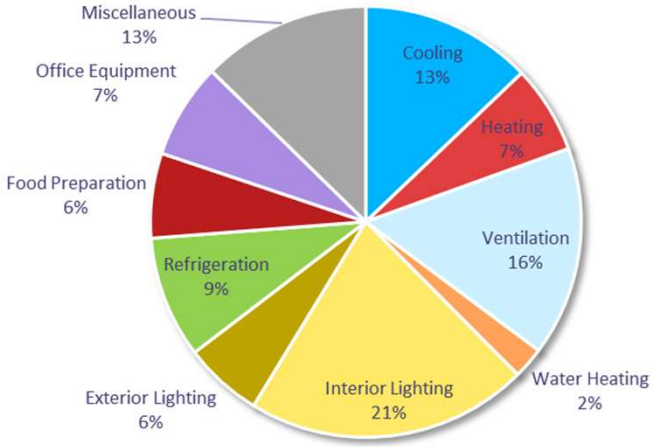
Overall Process Steps EE & DR

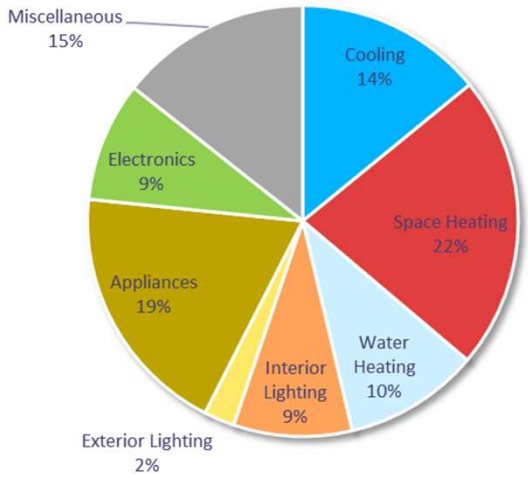


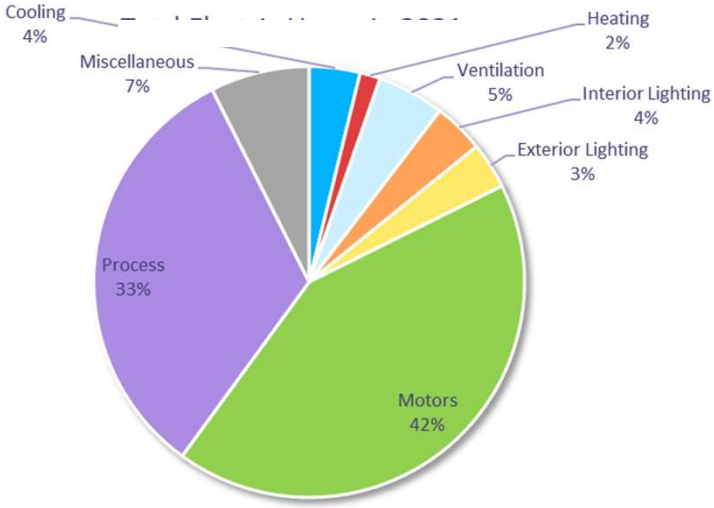
Market Characterization

- Define energy-consumption characteristics in the base year of the study (2023)
- Incorporates Idaho Power's actual consumption and customer counts to develop "Control Totals"
- Grounds the analysis in Idaho Power data and provides enough detail to project assumptions forward and develop a baseline energy projection
- After separating electric consumption into sectors and segments, it is allocated to specific end uses and technologies

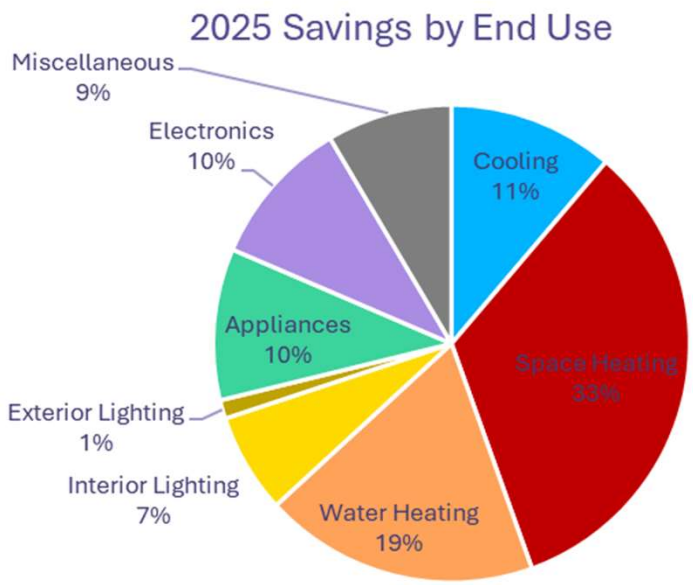
Base-year sector-level consumption by end-use:

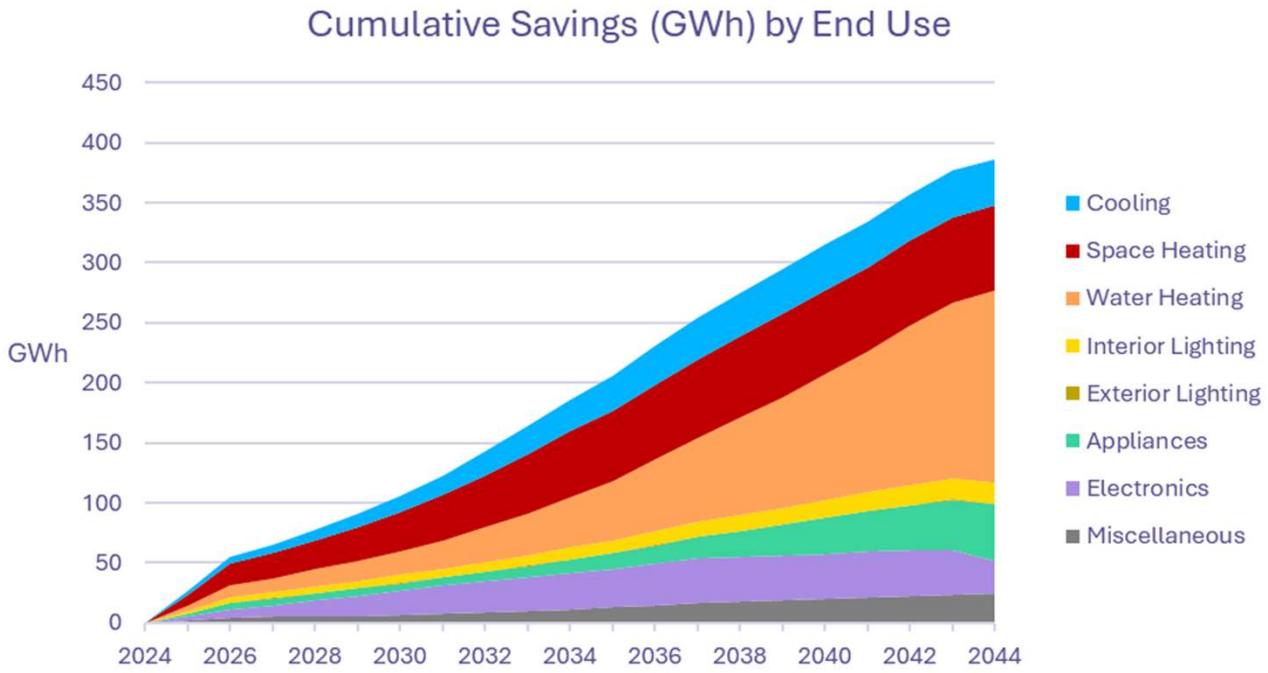




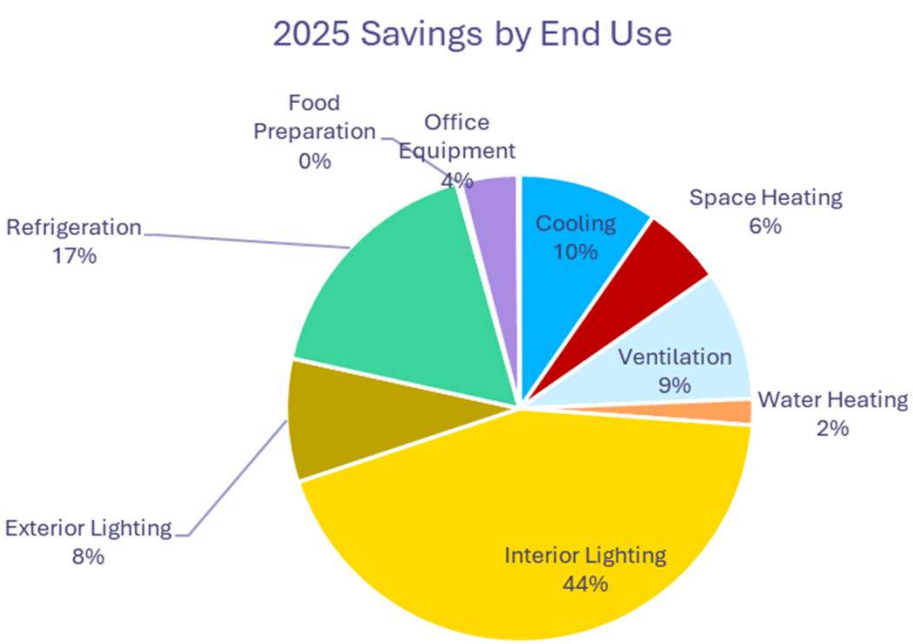


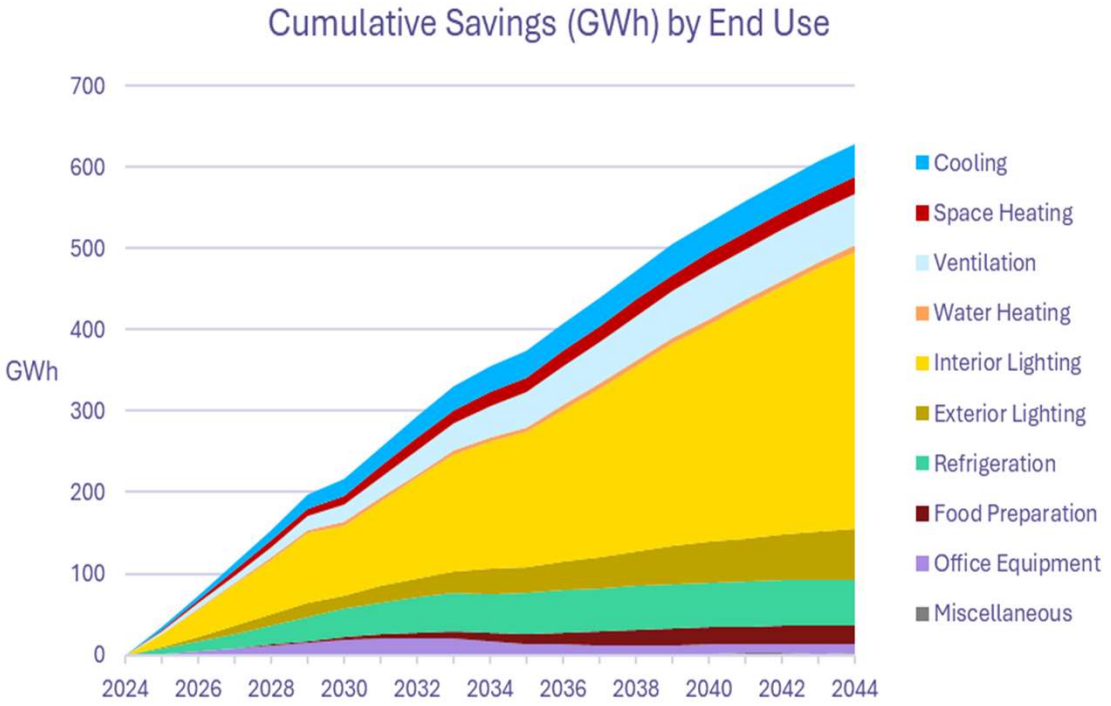
Residential EE Potential Study Results



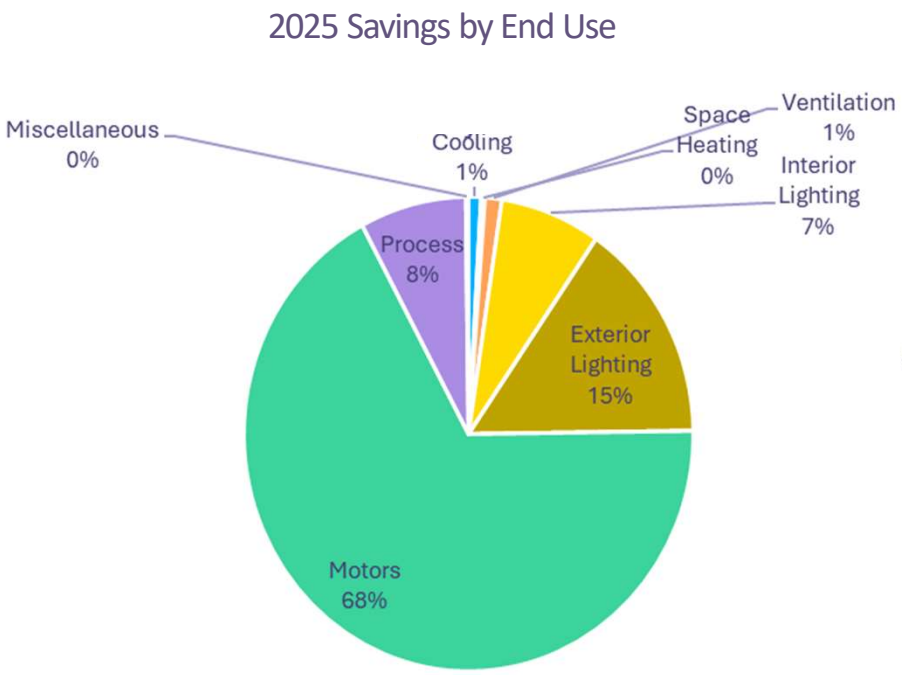


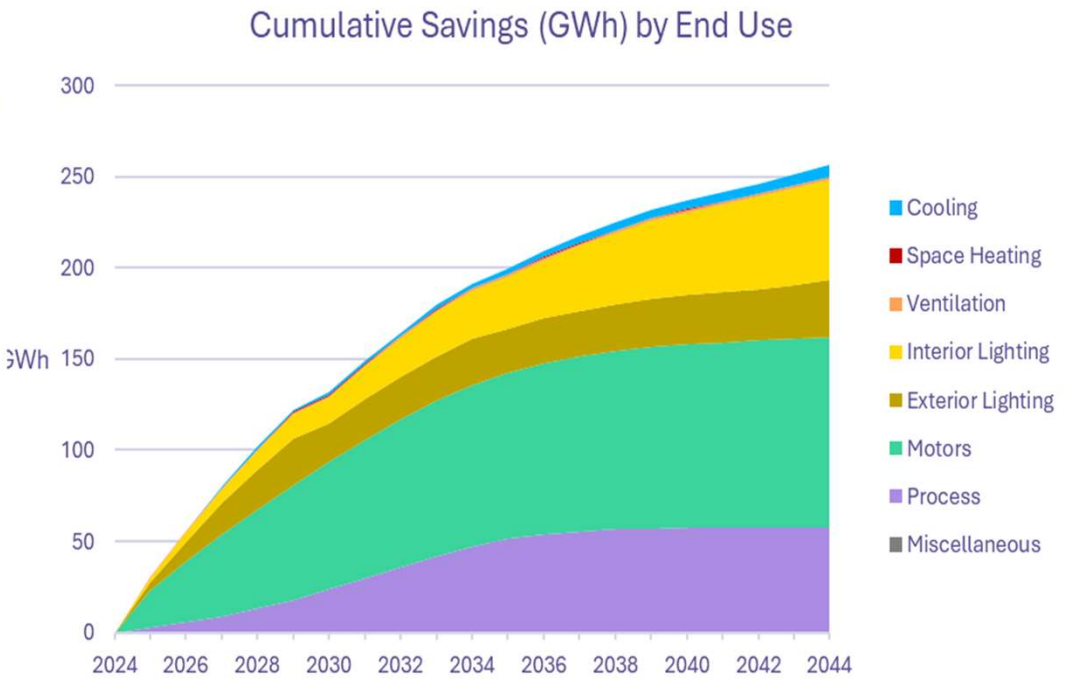
Commercial EE Potential Results



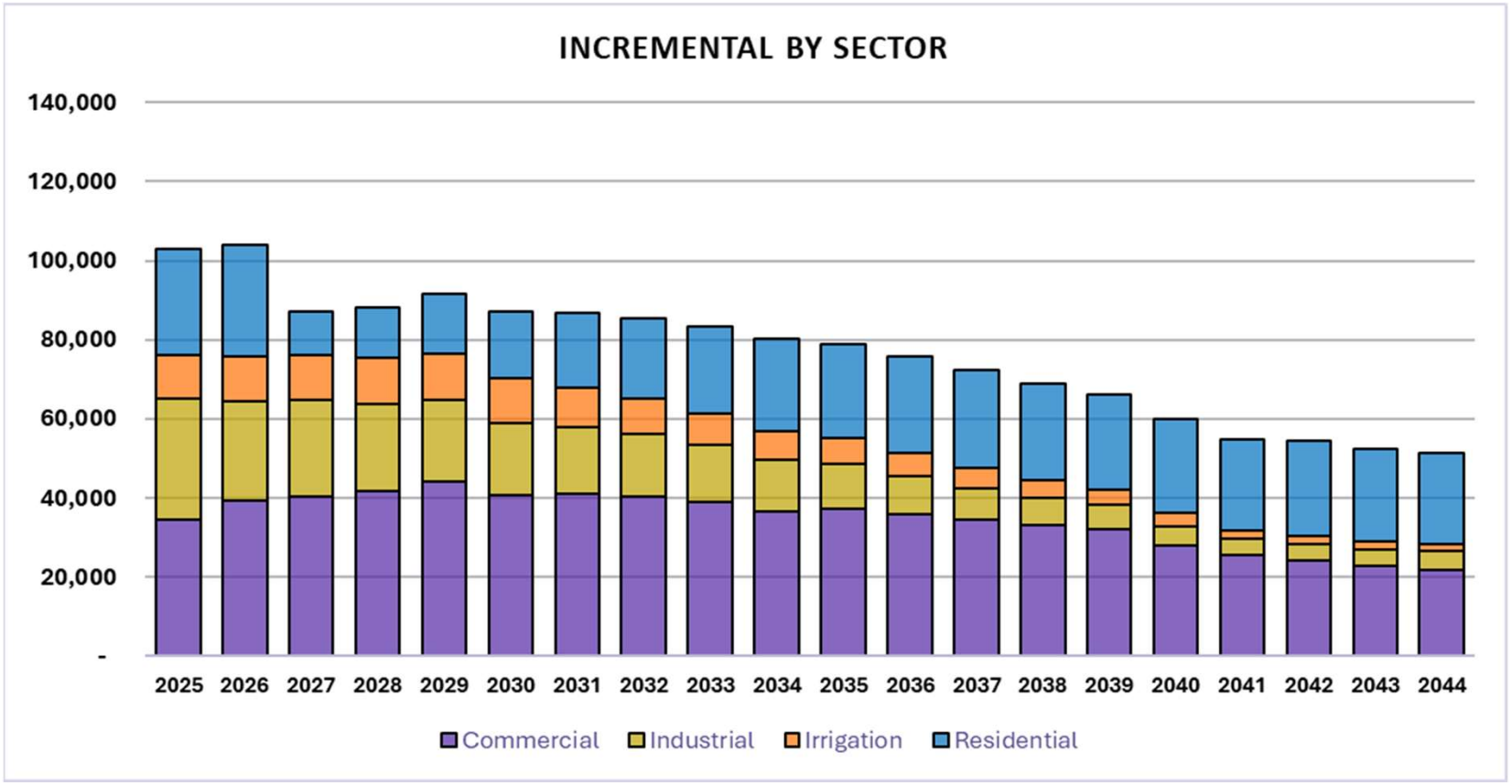


Industrial EE Potential Results

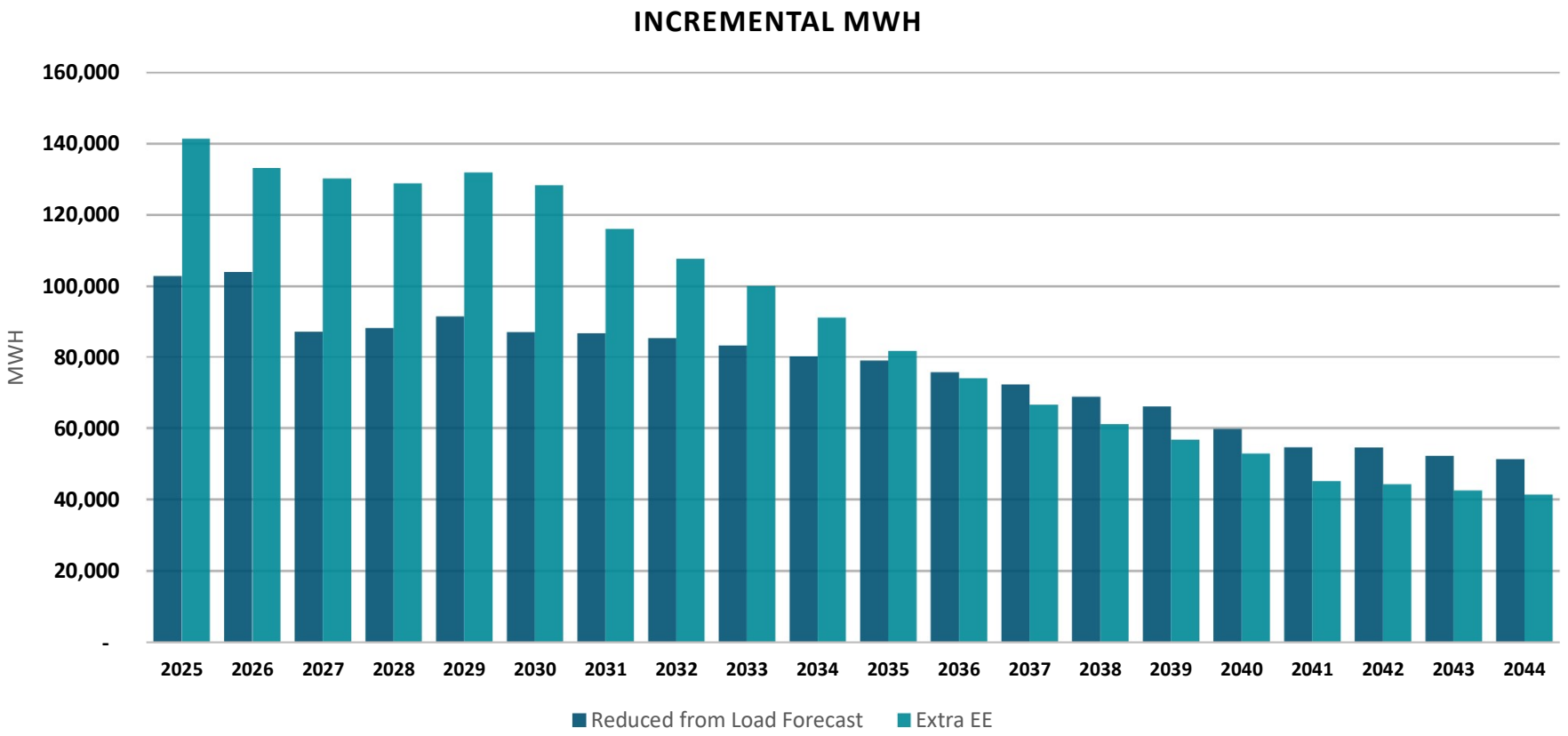




Potential Study Results EE Savings by Year
(Achievable Economic Potential)



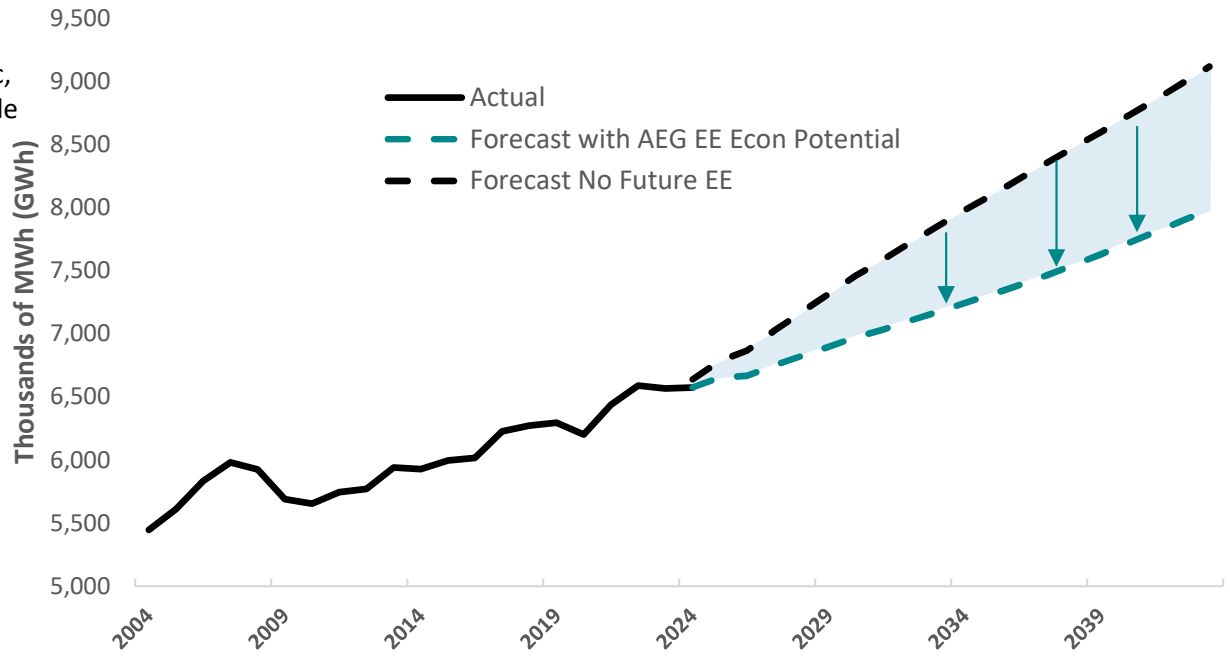
Potential Study Results



EE Measures in IRP

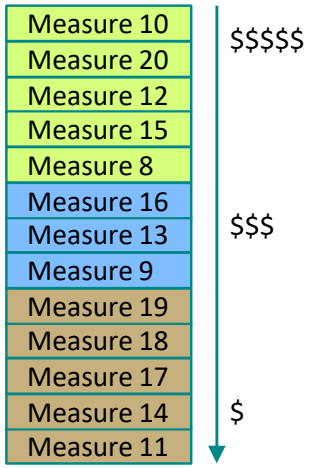
Measures 1-7
Measure 8
Measure 9
Measure 10
Measure 11
Measure 12
Measure 13
Measure 14
Measure 15
Measure 16
Measure 17
Measure 18
Measure 19
Measure 20

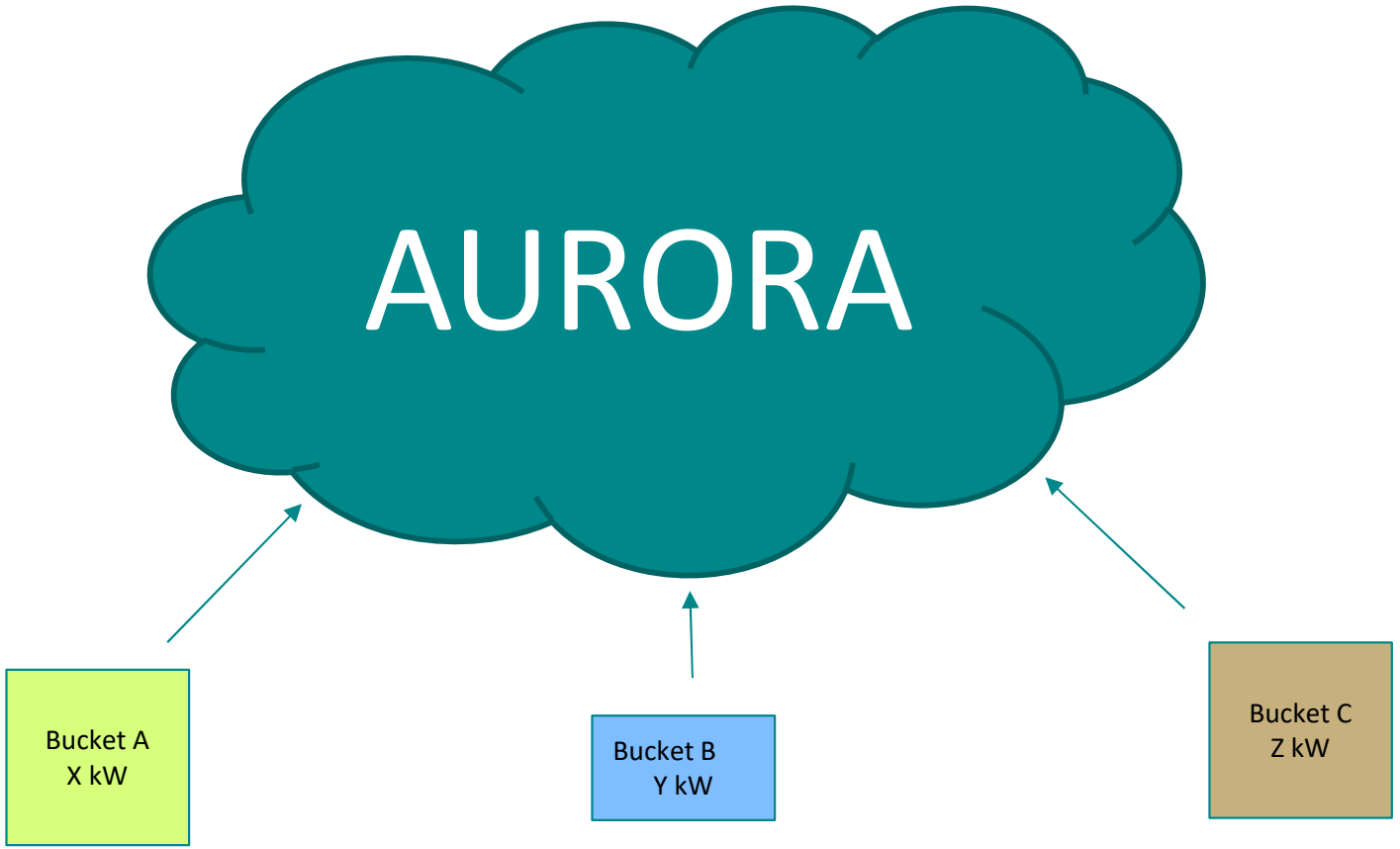
Economic, Achievable



Extra EE Measure Review

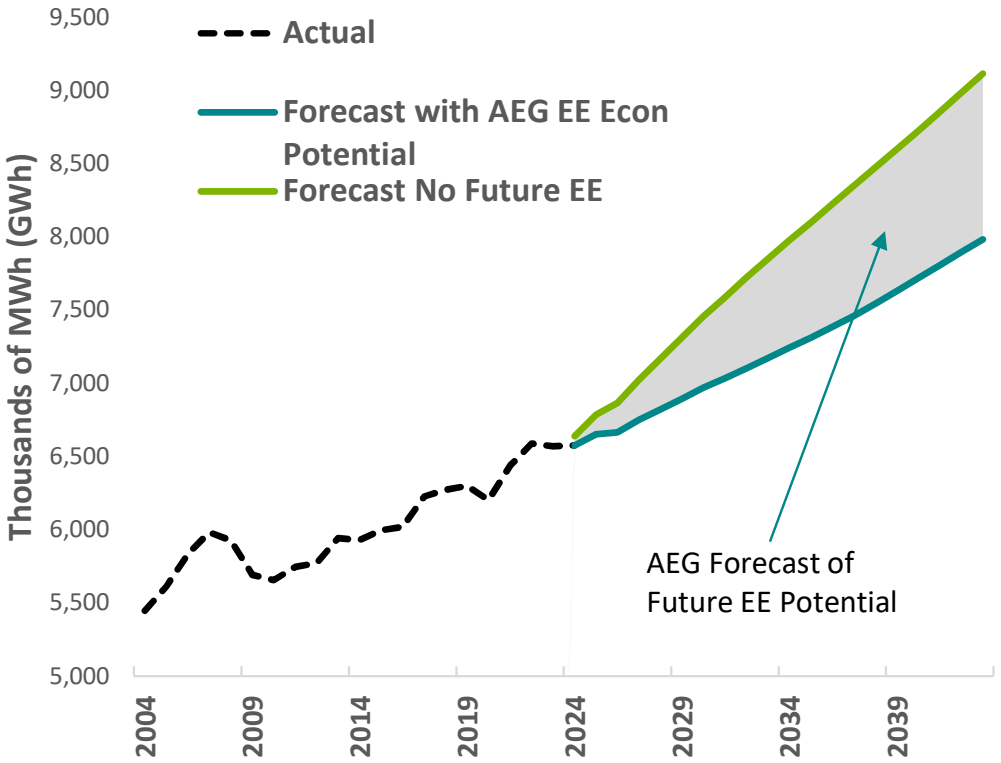
Group by cost & season



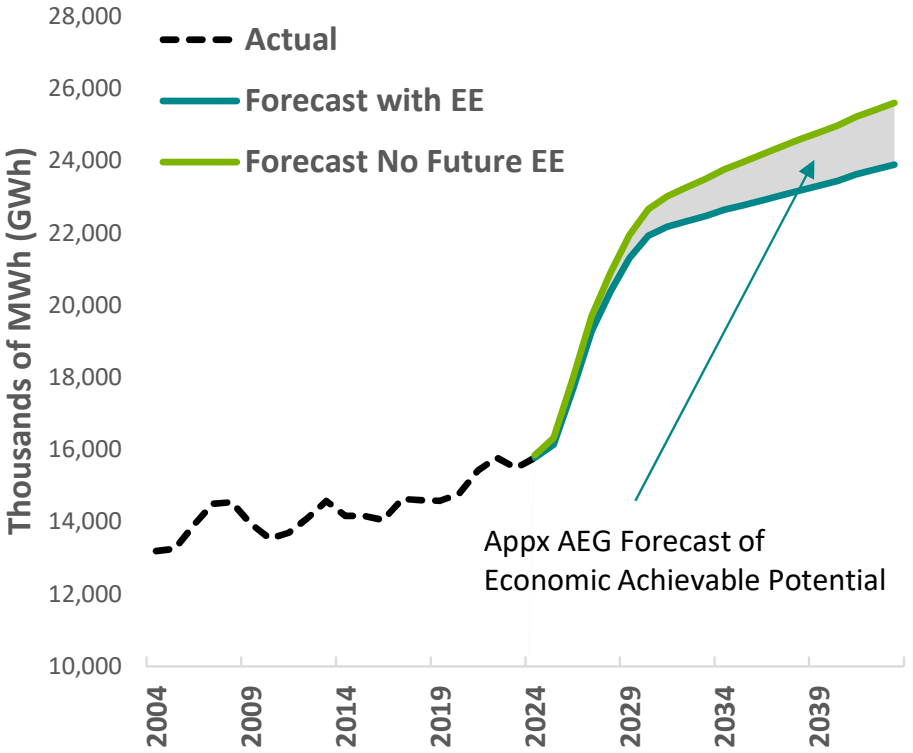


How EE Potential Used in IRP

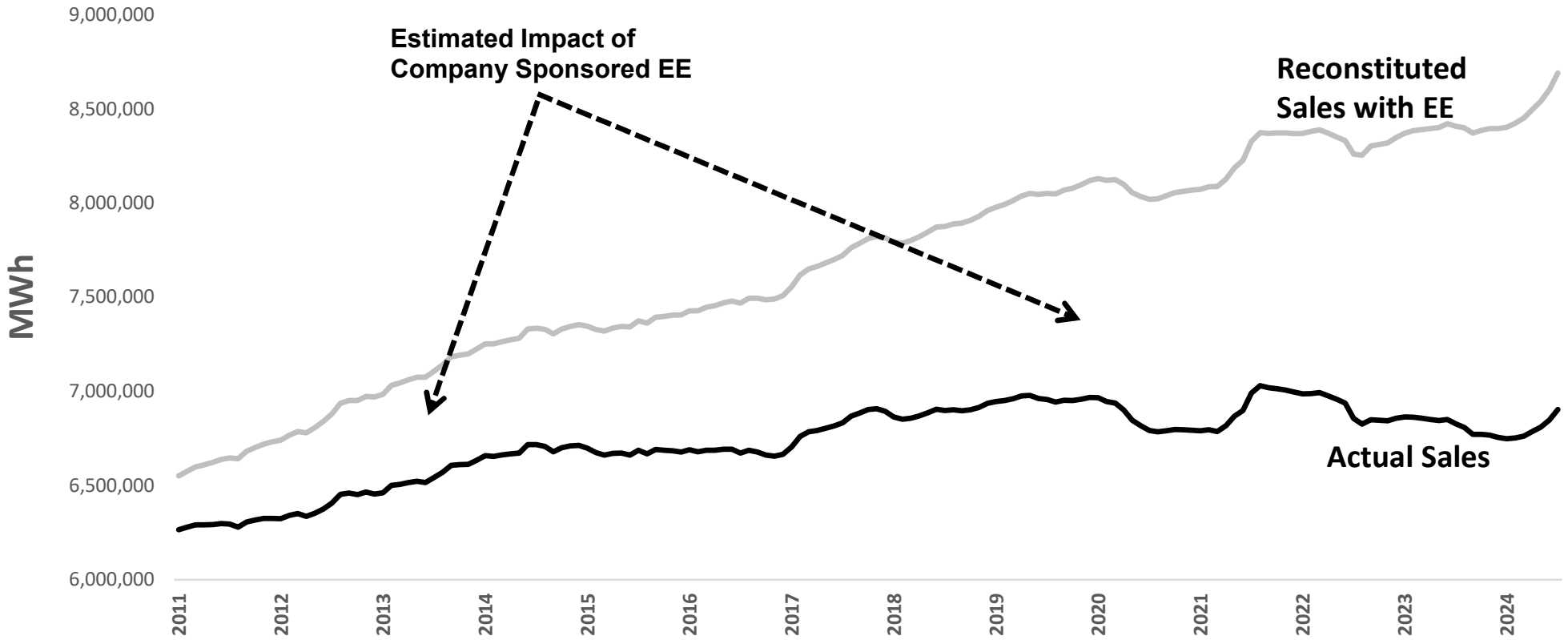
Class Example: Commercial and Industrial



System Aggregate

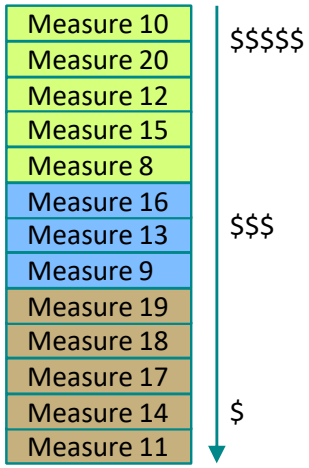


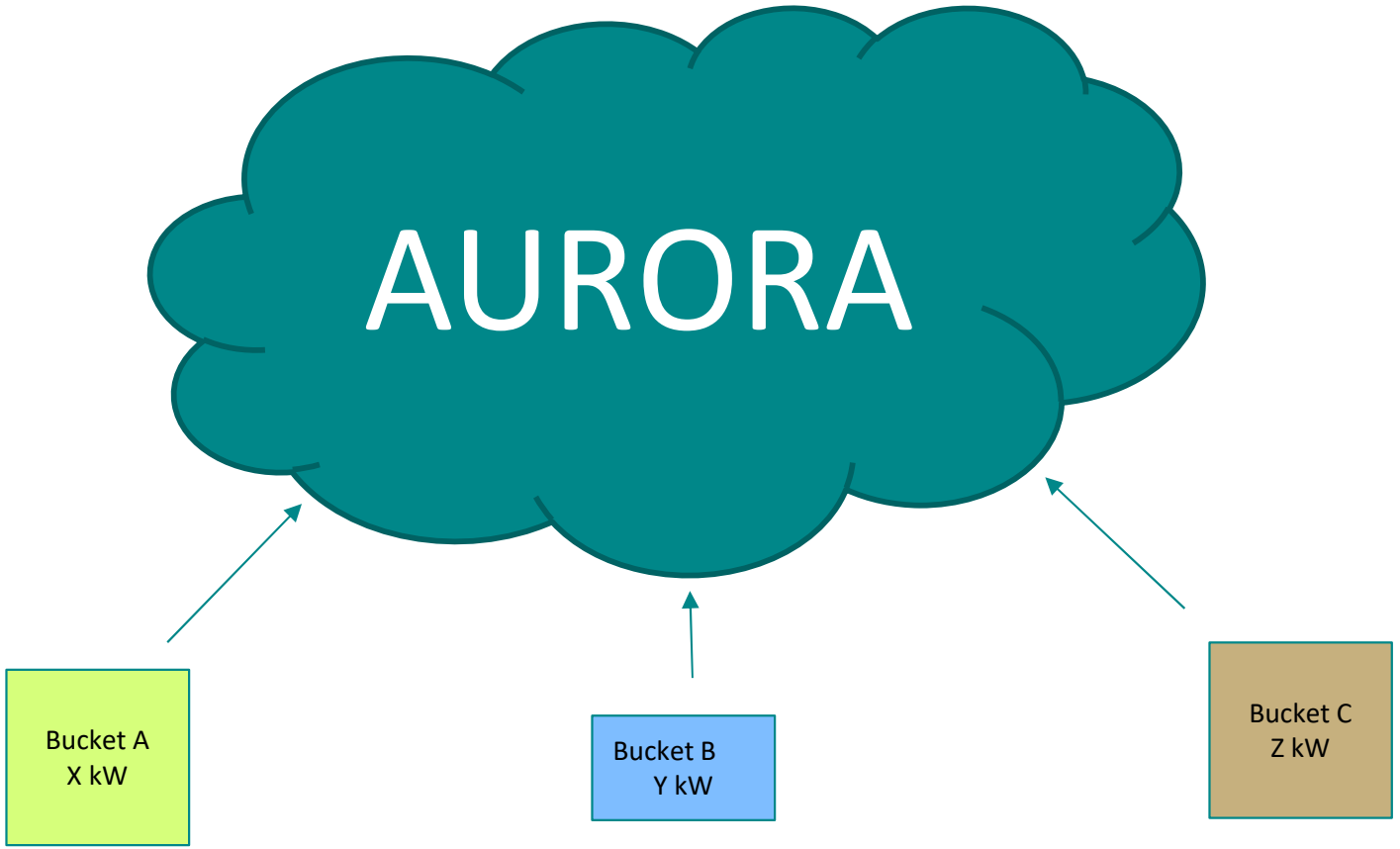
Impact of Historical EE on Load
Commercial and Industrial



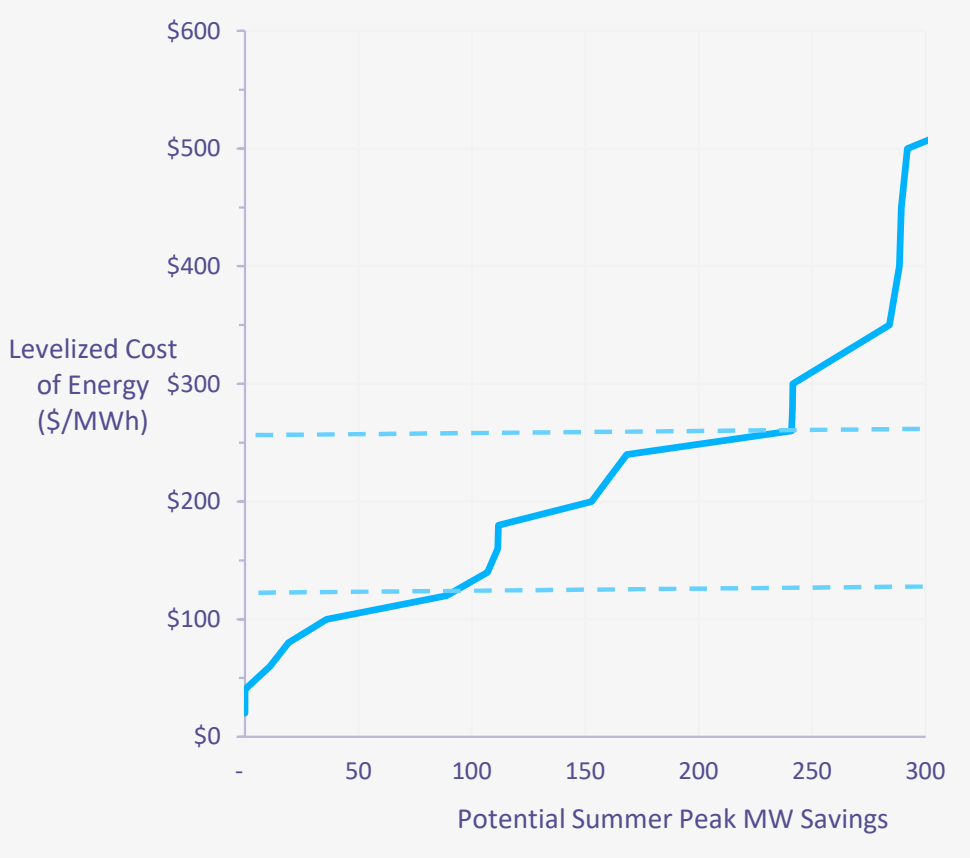
Extra EE Measure Review

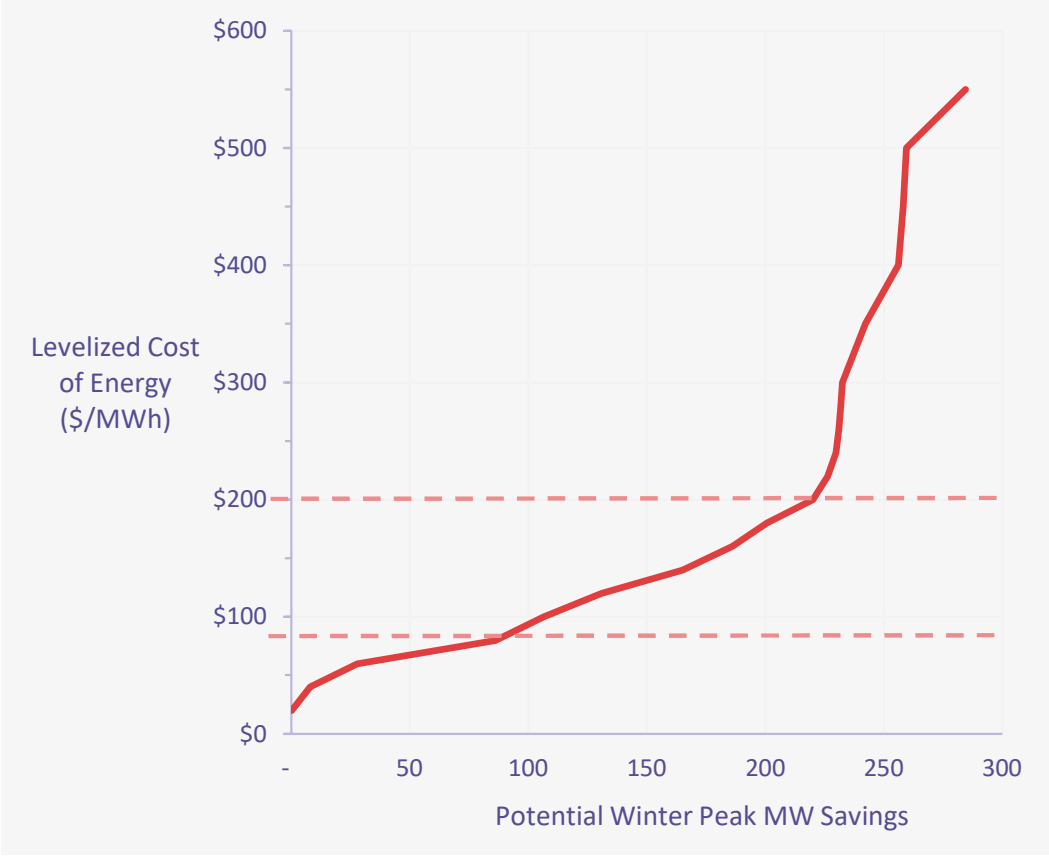
Group by cost & season





Extra EE Measures Review





Extra EE Measures Review(example from 2023 IRP)

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
Summer High Cost	5.52	9.02	13.41	16.92	21.37	24.74	26.93	29.09	31.81	33.99	41.41	43.95	46.76	50.29	52.63	52.99	58.39	58.88	56.68	54.35
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371

Energy Efficiency Measures Selectable in 2023 IRP Analysis

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
Summer High Cost	5.52	9.02	13.41	16.92	21.37	24.74	26.93	29.09	31.81	33.99	41.41	43.95	46.76	50.29	52.63	52.99	58.39	58.88	56.68	54.35
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371

Energy Efficiency Measures Selectable in 2023 IRP Analysis

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
Summer High Cost	5.52	9.02	13.41	16.92	21.37	24.74	26.93	29.09	31.81	33.99	41.41	43.95	46.76	50.29	52.63	52.99	58.39	58.88	56.68	54.35
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371

Energy Efficiency Measures Selectable in 2023 IRP Analysis

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
Summer High Cost	5.52	9.02	13.41	16.92	21.37	24.74	26.93	29.09	31.81	33.99	41.41	43.95	46.76	50.29	52.63	52.99	58.39	58.88	56.68	54.35
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371

Energy Efficiency Measures Selectable in 2023 IRP Analysis

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
Summer High Cost	5.52	9.02	13.41	16.92	21.37	24.74	26.93	29.09	31.81	33.99	41.41	43.95	46.76	50.29	52.63	52.99	58.39	58.88	56.68	54.35
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371

Integrated Resource Plan

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
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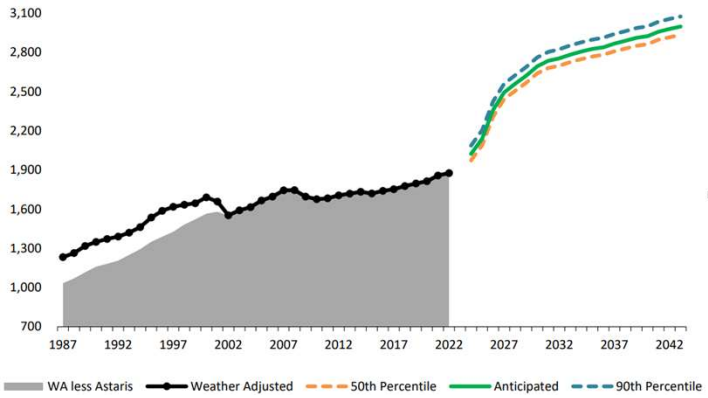
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371



Optimized Resource Expansion

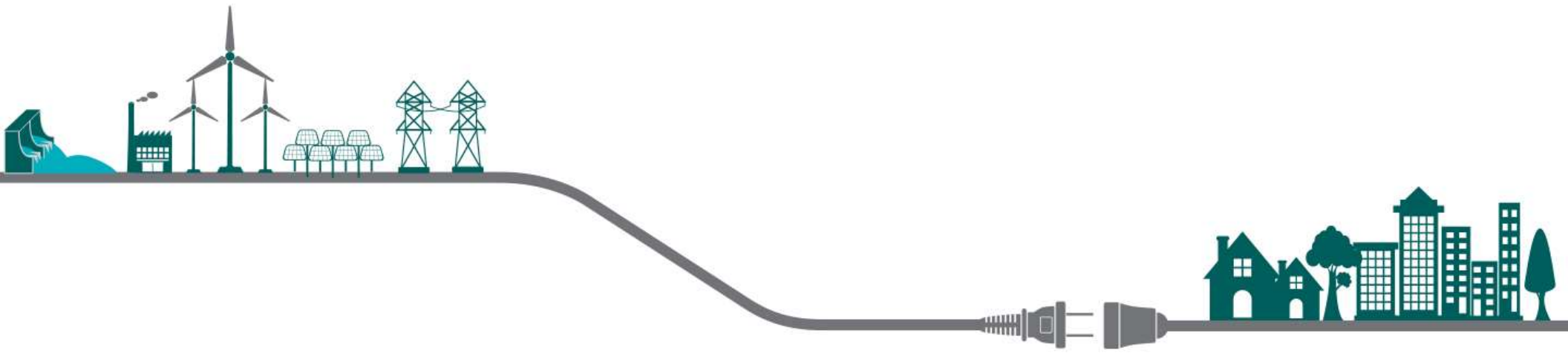
Preferred Portfolio—Valmy 1 & 2 (MW)

Year	Coal Exits	Gas	H2	Wind	Solar	4 Hr	8 Hr	100 Hr	Trans.	Geo	DR	EE Forecast
2024	-357	357	0	0	100	96	0	0	0	0	0	17
2025	0	0	0	0	200	227	0	0	0	0	0	18
2026	-134	261	0	0	100	0	0	0	Jul B2H	0	0	19
2027	0	0	0	400	375	5	0	0	0	0	0	20
2028	0	0	0	400	150	5	0	0	0	0	0	21
2029	0	0	0	400	0	5	0	0	GWW1	0	20	22
2030	-350	350	0	100	500	155	0	0	0	30	0	21
2031	0	0	0	400	400	5	0	0	GWW2	0	0	21
2032	0	0	0	100	100	205	0	0	0	0	0	20
2033	0	0	0	0	0	105	0	0	0	0	20	20
2034	0	0	0	0	0	5	0	0	0	0	40	19
2035	0	0	0	0	0	5	0	0	0	0	40	18
2036	0	0	0	0	0	5	0	0	0	0	40	17
2037	0	0	0	0	0	55	50	0	0	0	0	17
2038	0	-706	340	0	0	155	50	200	0	0	0	17
2039	0	0	0	0	0	5	50	0	0	0	0	15
2040	0	0	0	0	400	5	0	0	GWW3	0	0	14
2041	0	0	0	0	200	5	0	0	0	0	0	14
2042	0	0	0	0	200	55	0	0	0	0	0	14
2043	0	0	0	0	600	0	0	0	0	0	0	14
Sub Total	**841**	**261**	**340**	**1,800**	**3,325**	**1,103**	**150**	**200**		**30**	**160**	**360**
Total	**6,888**											

EE Extra Potential - Next Steps

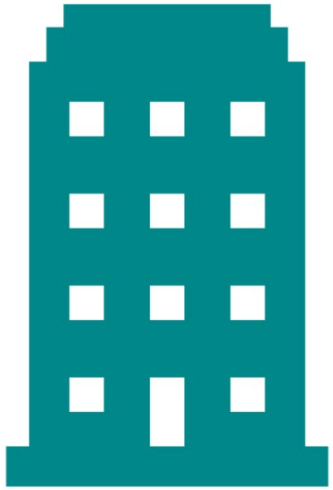
- Determine final Bundles of Extra EE Potential with weighted average costs and enter into AURORA for selection
  - ✓ Outcome will be reviewed at a future IRPAC meeting

Demand Response for the 2025 IRP



Idaho Power's Existing Demand Response Programs

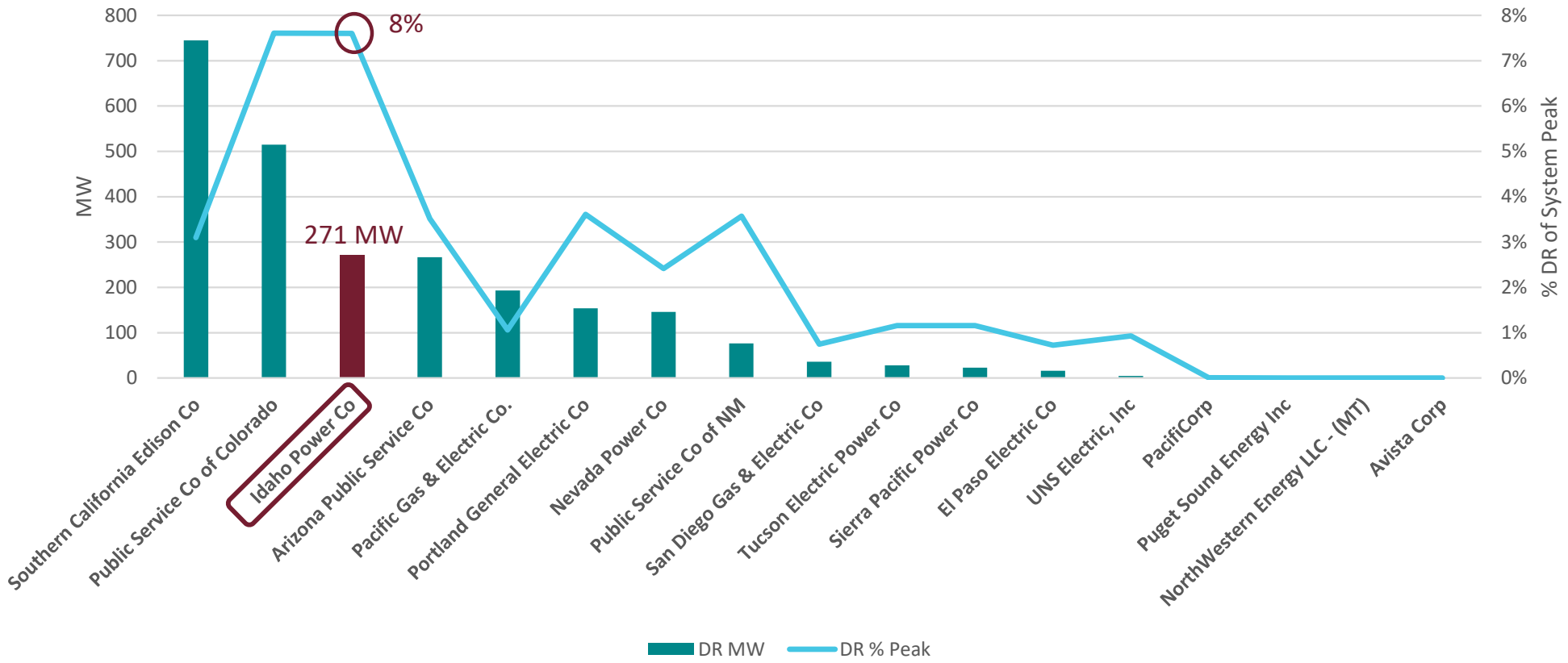
- 24.4 MW Estimated Max Potential Capacity
- 17,566 Customer Sites



- 41 MW Estimated Max Potential Capacity
- 311 Customer Sites

- 260 MW Estimated Max Potential Capacity
- 2,518 Customer Sites

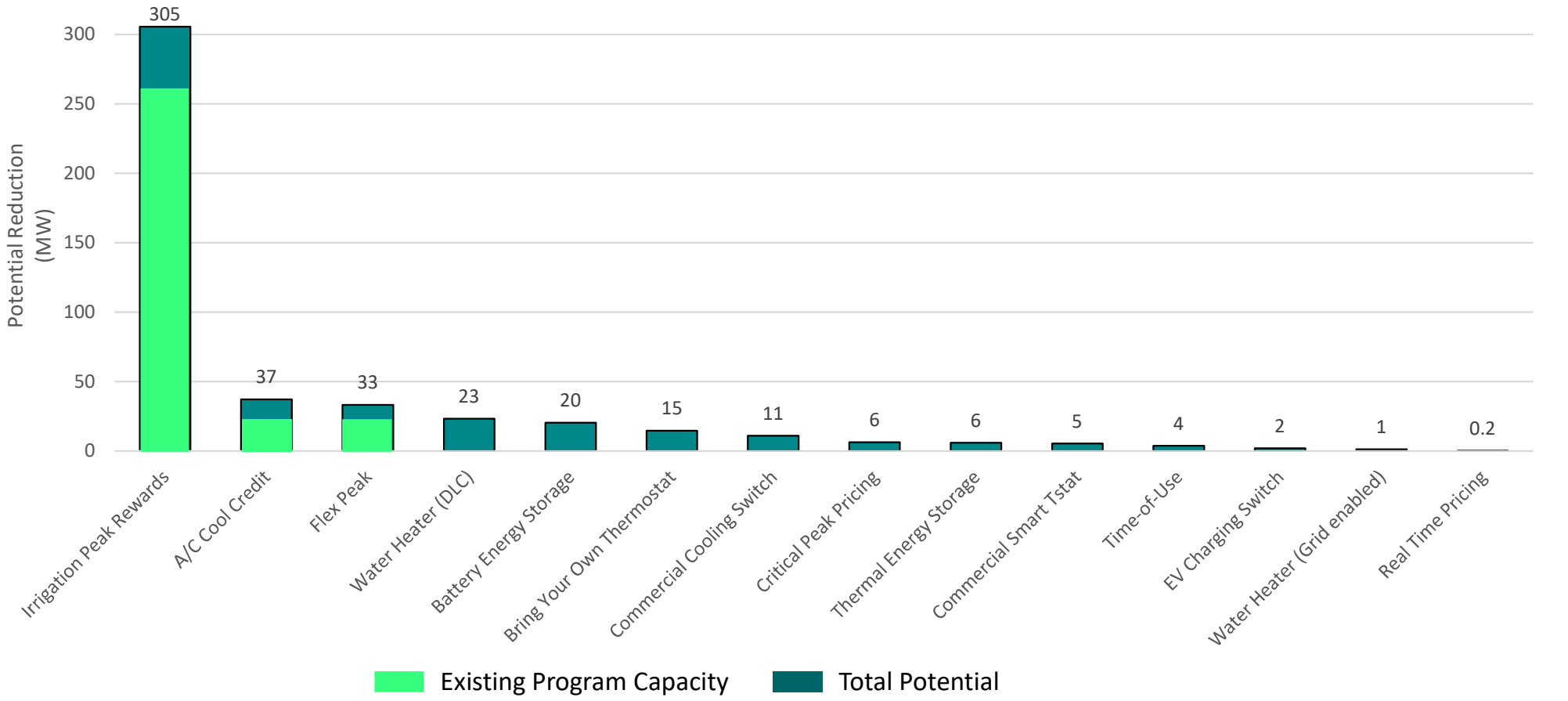
Investor Owned Utilities in WECC



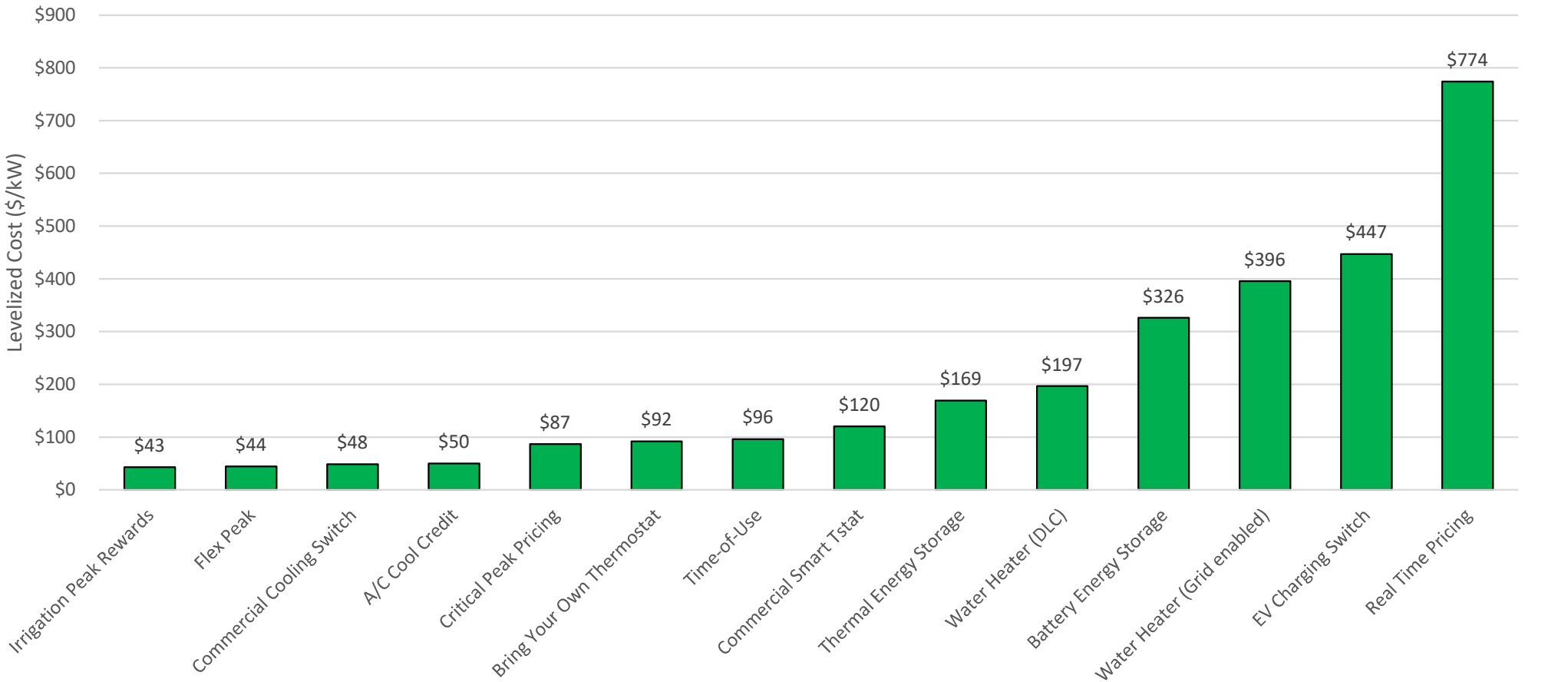
DR Potential Study Programs

Residential	Commercial	Industrial/Irrigation
Residential Critical Peak Pricing (CPP)	Commercial Critical Peak Pricing	Industrial Critical Peak Pricing
Residential Time of Use (TOU)	Small Commercial Bring-Your-Own-Thermostat (BYOT)	Industrial Real Time Pricing (RTP)
Residential Electric Vehicle Supply Equipment Control	Commercial Curtailable Load	Industrial Curtailable Load
Residential Electric Resistance Water Heater Control Grid and Switch	Commercial Small Building Control Switch Cool and Heat	Irrigation Control Large and Small/Medium Farms
Residential Heat Pump Water Heater Control Grid and Switch	Commercial Medium Building Control Switch Cool and Heat	Thermal Storage
Residential AC and Heat Control Switch	Battery Storage	
Residential Bring-Your-Own-Thermostat (BYOT)	Thermal Storage	
Battery Storage		

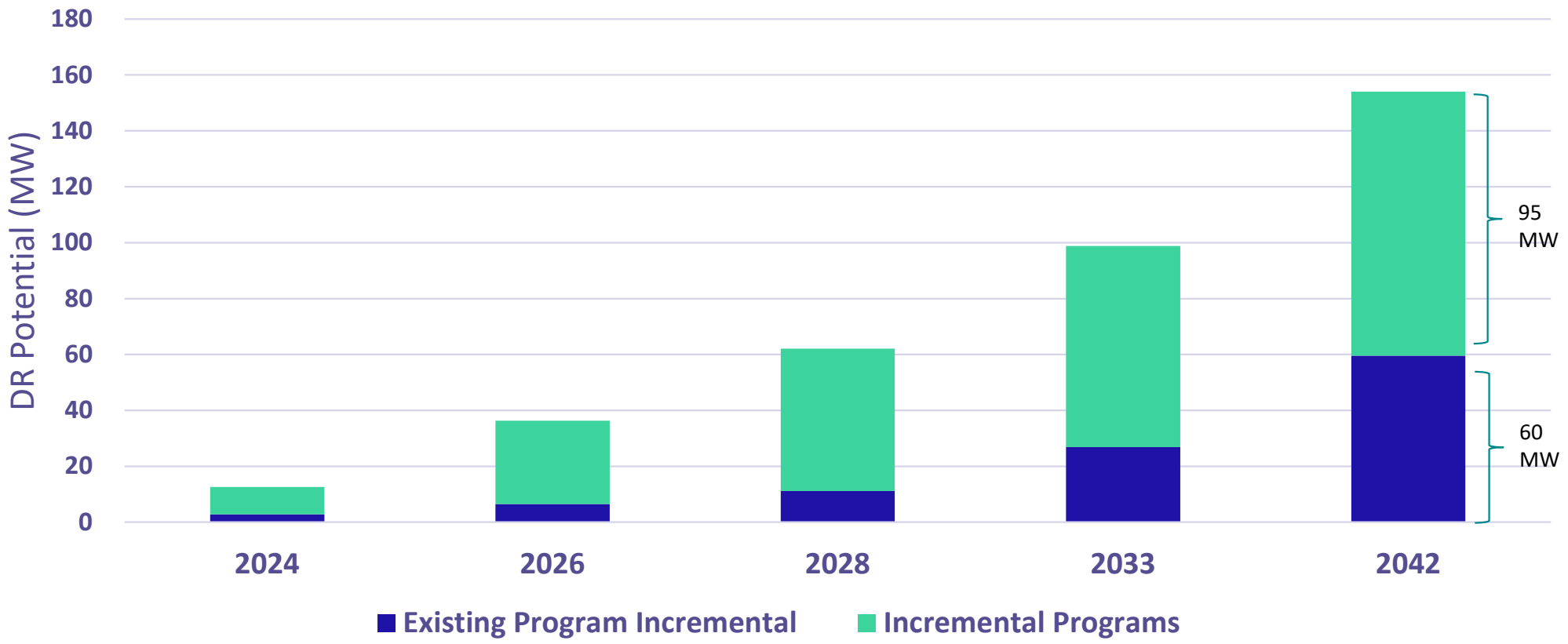
DR Potential Study Results



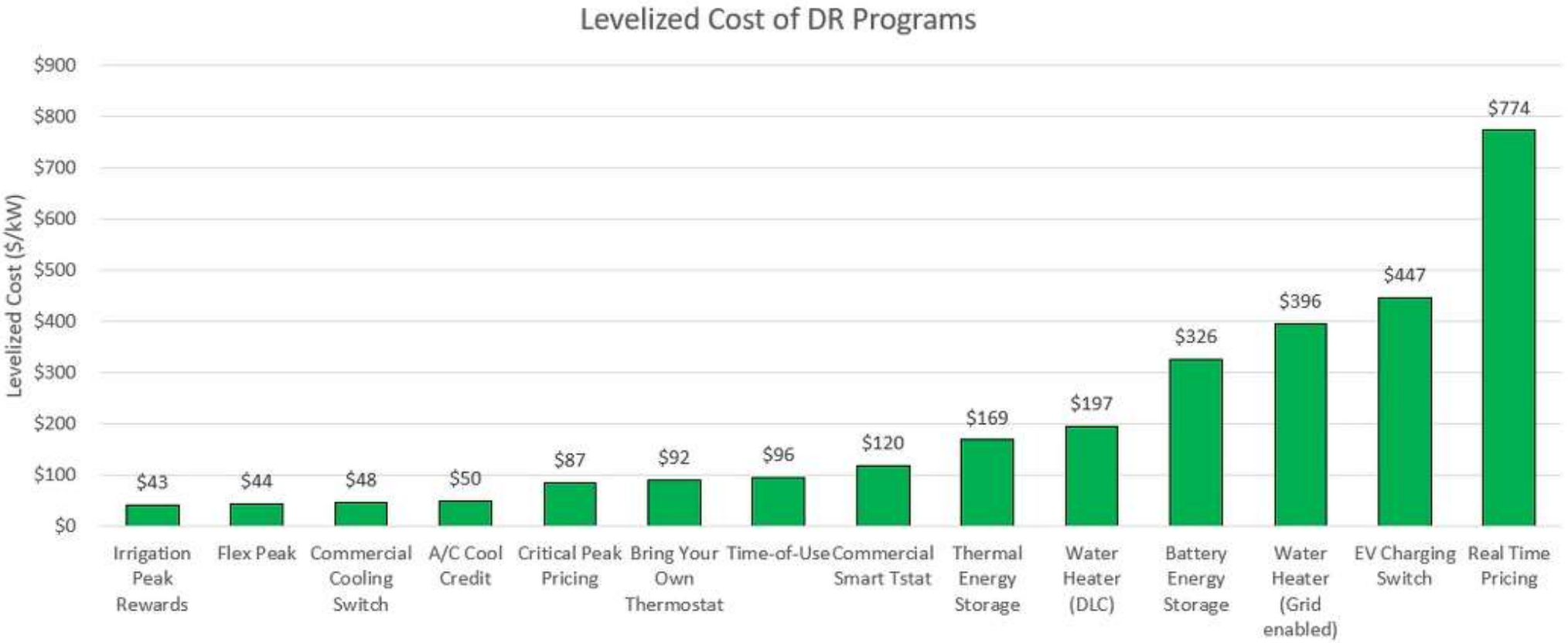
DR Program Estimated Costs



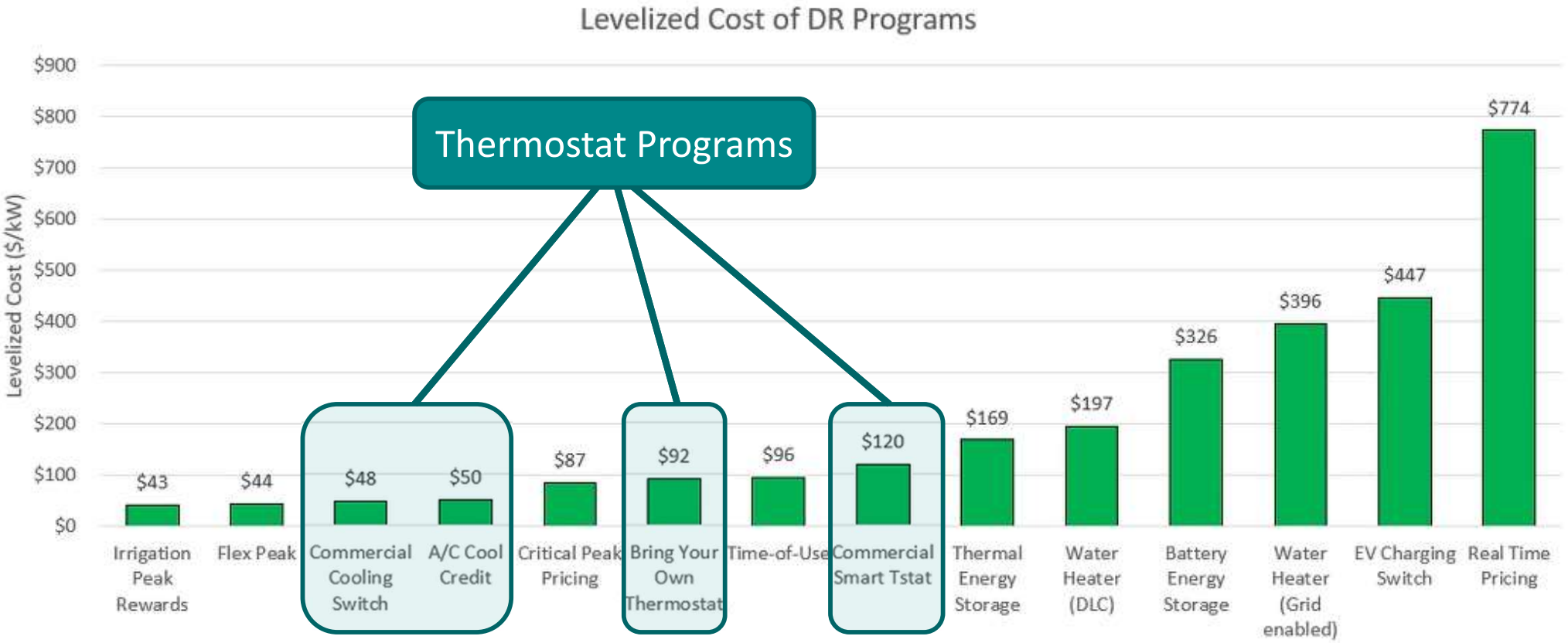
DR Potential (without existing programs)



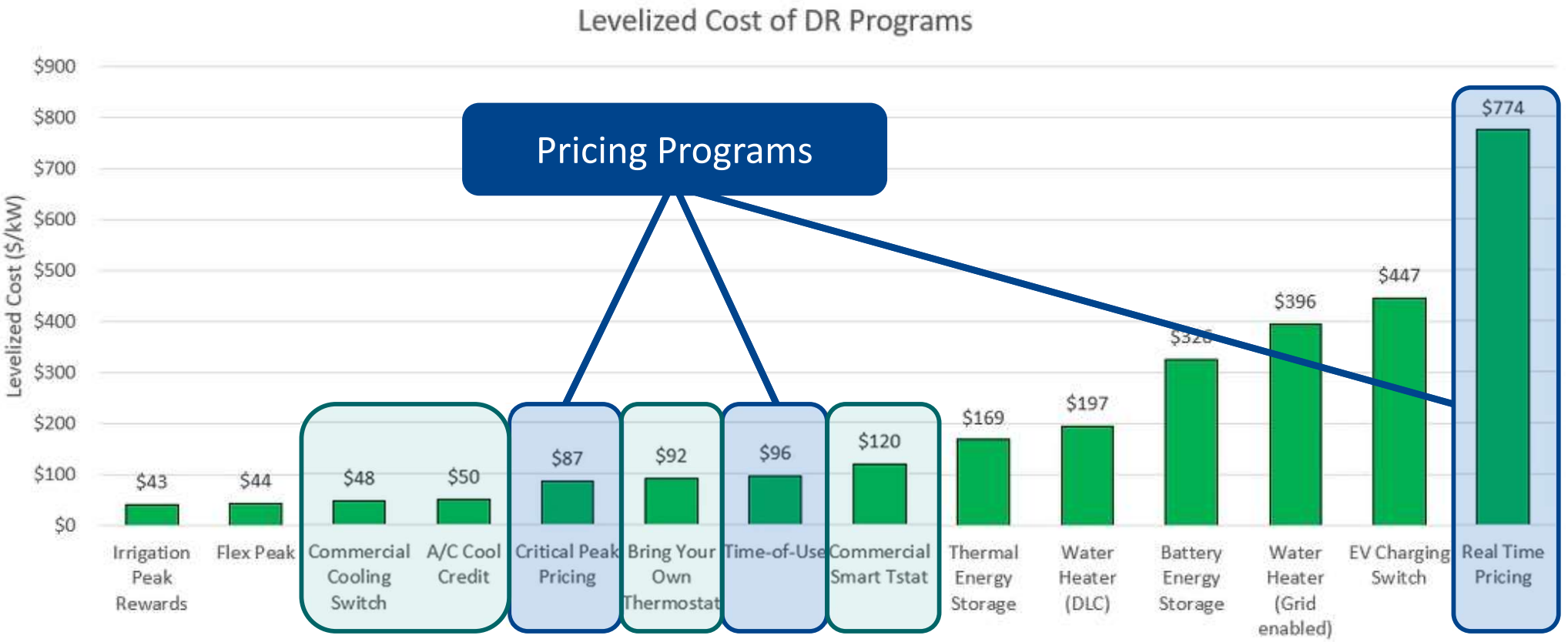
DR Program Estimated Costs



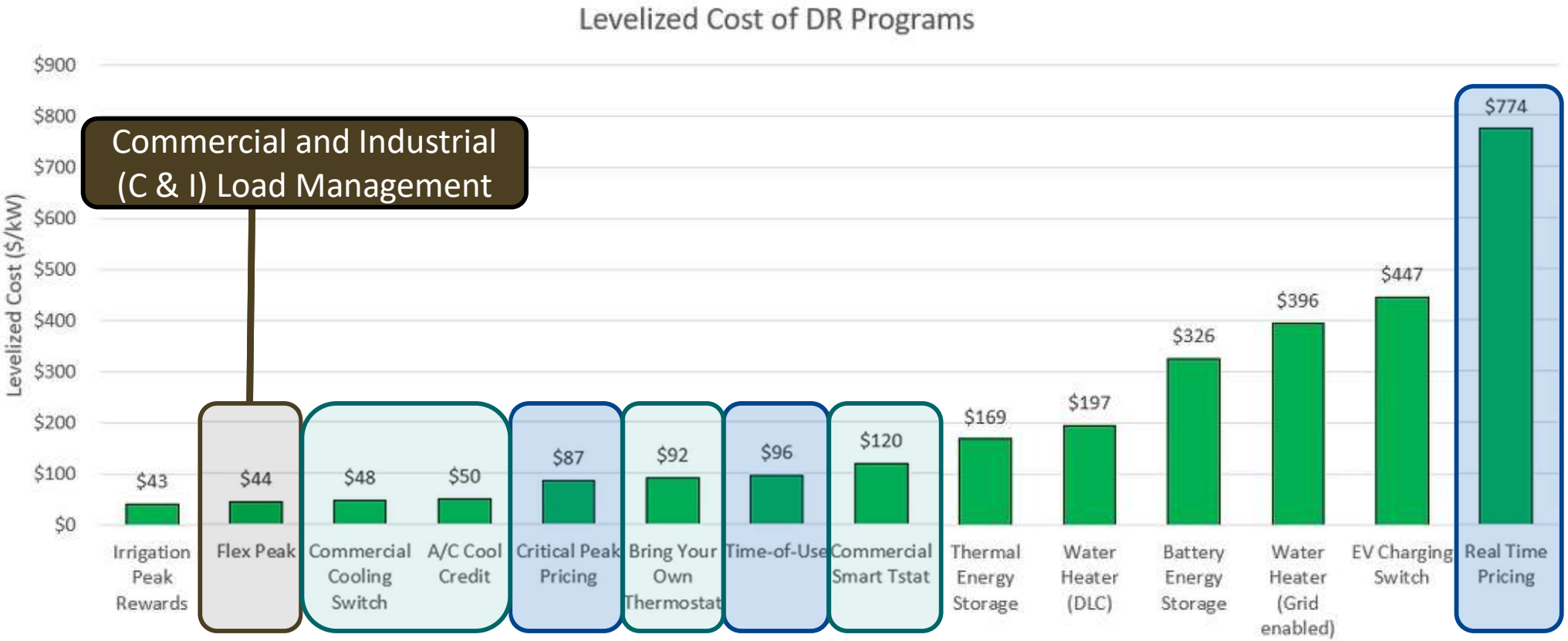
DR Program Estimated Costs



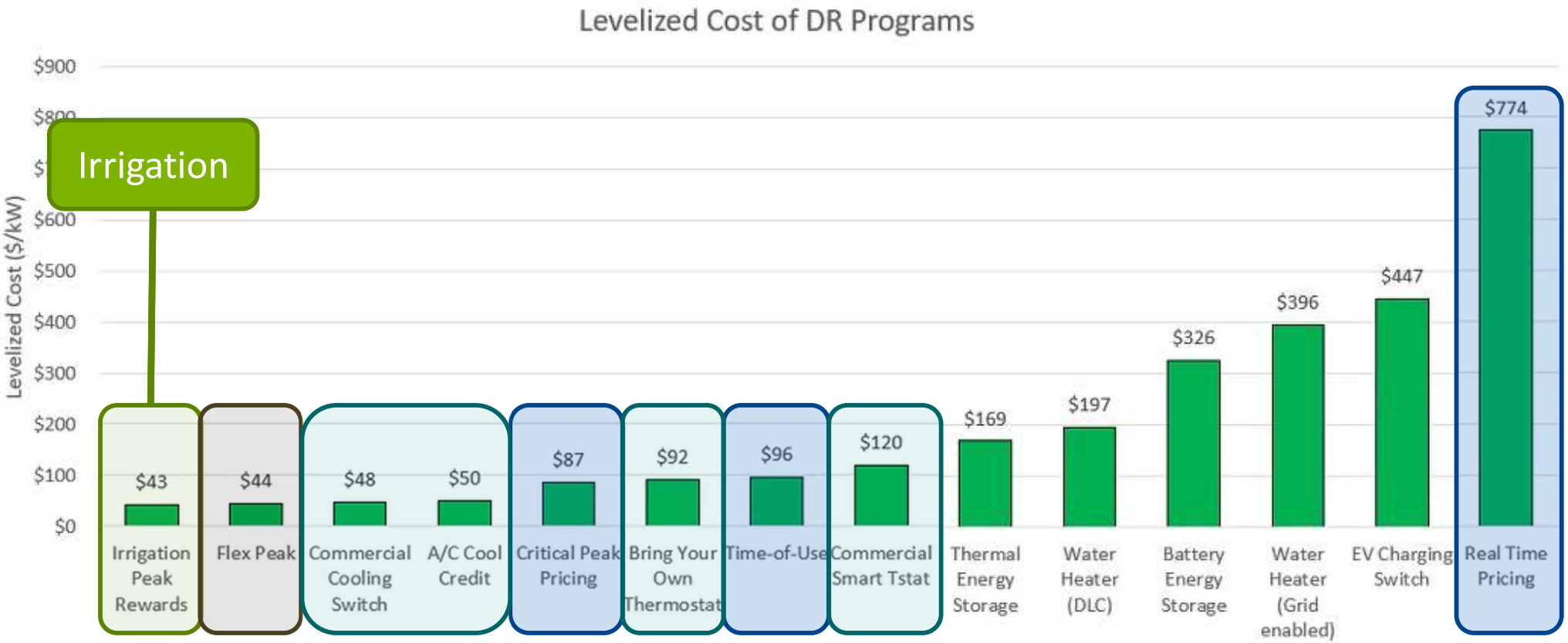
DR Program Estimated Costs



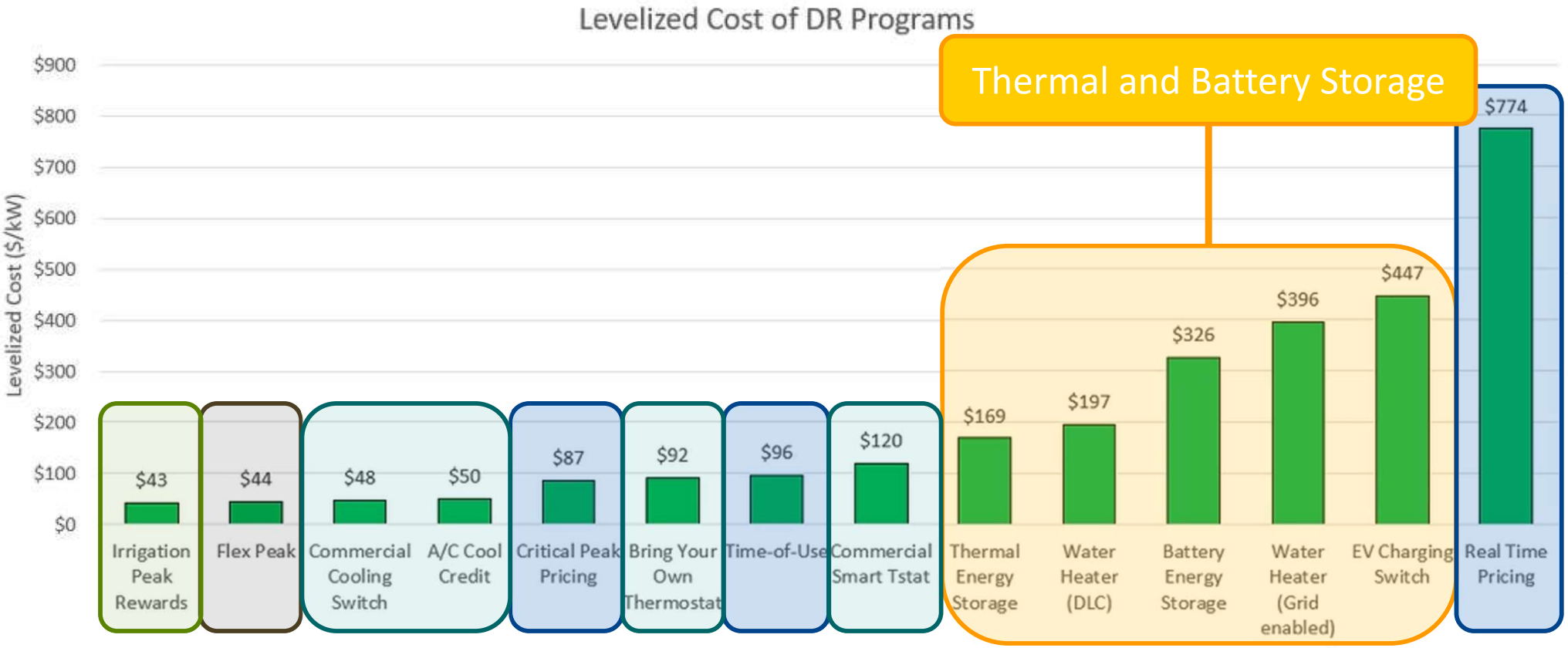
DR Program Estimated Costs



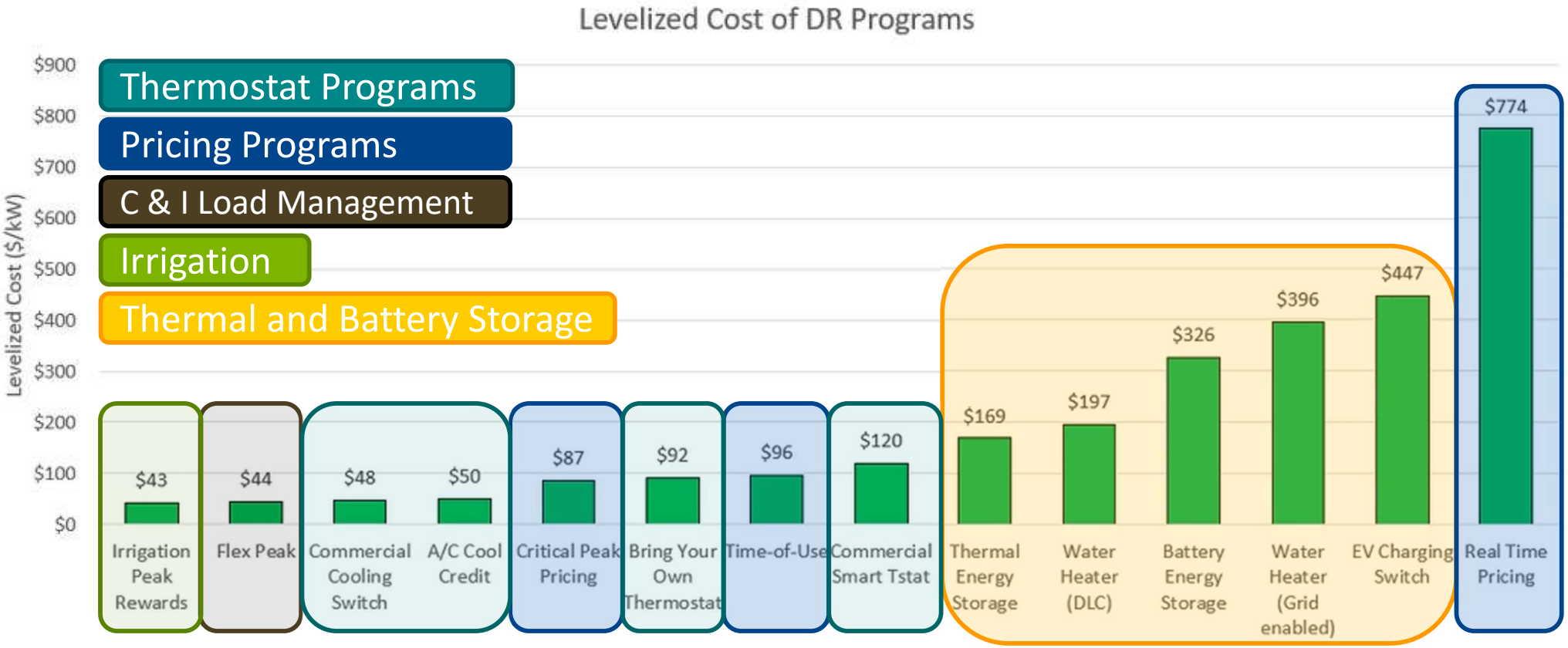
DR Program Estimated Costs



DR Program Estimated Costs



DR Program Estimated Costs



Integrated Resource Plan

Annual Non-Coincident Peak Savings Megawatts (MW)

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
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Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
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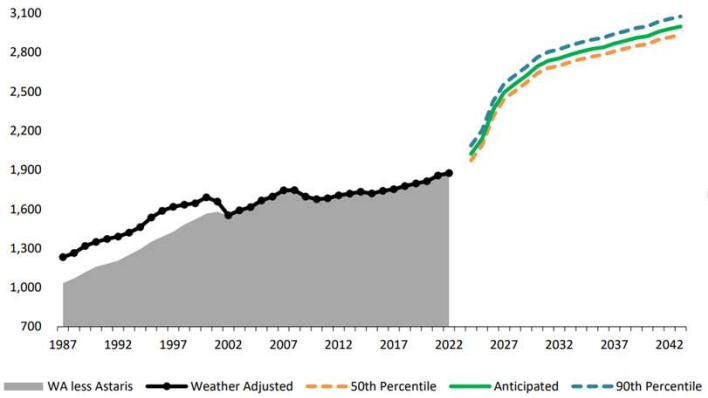

Optimized Resource Expansion

Preferred Portfolio—Valmy 1 & 2 (MW)

Year	Coal Exits	Gas	H2	Wind	Solar	4 Hr	8 Hr	100 Hr	Trans.	Geo	DR	EE Forecast
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2025	0	0	0	0	200	227	0	0	0	0	0	18
2026	-134	261	0	0	100	0	0	0	Jul B2H	0	0	19
2027	0	0	0	400	375	5	0	0	0	0	0	20
2028	0	0	0	400	150	5	0	0	0	0	0	21
2029	0	0	0	400	0	5	0	0	GWW1	0	20	22
2030	-350	350	0	100	500	155	0	0	0	30	0	21
2031	0	0	0	400	400	5	0	0	GWW2	0	0	21
2032	0	0	0	100	100	205	0	0	0	0	0	20
2033	0	0	0	0	0	105	0	0	0	0	20	20
2034	0	0	0	0	0	5	0	0	0	0	40	19
2035	0	0	0	0	0	5	0	0	0	0	40	18
2036	0	0	0	0	0	5	0	0	0	0	40	17
2037	0	0	0	0	0	55	50	0	0	0	0	17
2038	0	-706	340	0	0	155	50	200	0	0	0	17
2039	0	0	0	0	0	5	50	0	0	0	0	15
2040	0	0	0	0	400	5	0	0	GWW3	0	0	14
2041	0	0	0	0	200	5	0	0	0	0	0	14
2042	0	0	0	0	200	55	0	0	0	0	0	14
2043	0	0	0	0	600	0	0	0	0	0	0	14
Sub Total	**841**	**261**	**340**	**1,800**	**3,325**	**1,103**	**150**	**200**		**30**	**160**	**360**
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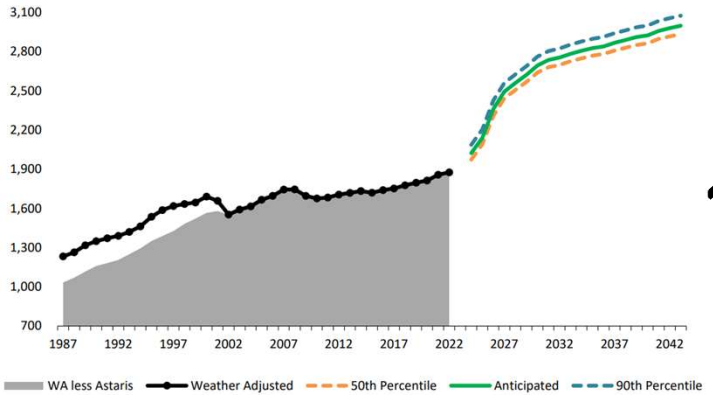
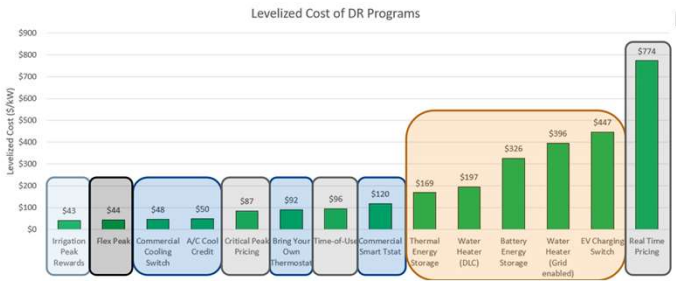
Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Summer Low Cost	5.83	5.81	6.36	6.65	7.31	7.67	8.01	8.29	8.51	8.45	7.47	6.93	6.49	6.14	6.04	5.88	5.74	5.75	5.78	5.84
Summer Mid Cost	0.98	1.27	1.58	1.79	2.06	2.10	2.24	2.25	2.22	2.03	2.02	1.85	1.70	1.45	1.48	1.32	1.15	1.11	1.11	1.06
Summer High Cost	5.52	9.02	13.41	16.92	21.37	24.74	26.93	29.09	31.81	33.99	41.41	43.95	46.76	50.29	52.63	52.99	58.39	58.88	56.68	54.35
Winter Low Cost	4.78	5.94	7.43	8.65	10.45	11.26	10.94	10.71	10.63	10.59	10.64	10.76	10.94	11.43	11.86	11.91	11.33	13.20	13.07	12.91
Winter High Cost	1.30	2.68	4.25	5.72	7.40	8.52	9.46	10.94	11.86	12.50	12.69	12.66	12.63	12.95	13.09	13.15	13.07	13.83	13.53	13.41

Savings-Weighted LCOE ($/MWh) Dollars

Bundle	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	20-Year Avg.
Summer Low Cost	$75	$77	$79	$79	$80	$80	$80	$80	$80	$81	$82	$83	$83	$82	$81	$80	$79	$78	$77	$77	$80
Summer Mid Cost	$154	$162	$167	$173	$176	$177	$177	$177	$174	$174	$172	$173	$172	$171	$172	$173	$172	$171	$170	$169	$172
Summer High Cost	$904	$798	$740	$720	$695	$669	$635	$608	$576	$551	$517	$499	$485	$470	$456	$435	$408	$400	$392	$388	$501
Winter Low Cost	$83	$85	$84	$84	$83	$82	$80	$77	$74	$71	$68	$66	$64	$61	$59	$56	$54	$52	$52	$52	$68
Winter High Cost	$753	$632	$592	$559	$540	$514	$482	$466	$432	$405	$382	$365	$350	$335	$315	$289	$277	$255	$237	$236	$371





Optimized Resource Expansion

Preferred Portfolio—Valmy 1 & 2 (MW)

Year	Coal Exits	Gas	H2	Wind	Solar	4 Hr	8 Hr	100 Hr	Trans.	Geo	DR	EE Forecast
2024	-357	357	0	0	100	96	0	0	0	0	0	17
2025	0	0	0	0	200	227	0	0	0	0	0	18
2026	-134	261	0	0	100	0	0	0	Jul B2H	0	0	19
2027	0	0	0	400	375	5	0	0	0	0	0	20
2028	0	0	0	400	150	5	0	0	0	0	0	21
2029	0	0	0	400	0	5	0	0	GWW1	0	20	22
2030	-350	350	0	100	500	155	0	0	0	30	0	21
2031	0	0	0	400	400	5	0	0	GWW2	0	0	21
2032	0	0	0	100	100	205	0	0	0	0	0	20
2033	0	0	0	0	0	105	0	0	0	0	20	20
2034	0	0	0	0	0	5	0	0	0	0	40	19
2035	0	0	0	0	0	5	0	0	0	0	40	18
2036	0	0	0	0	0	5	0	0	0	0	40	17
2037	0	0	0	0	0	55	50	0	0	0	0	17
2038	0	-706	340	0	0	155	50	200	0	0	0	17
2039	0	0	0	0	0	5	50	0	0	0	0	15
2040	0	0	0	0	400	5	0	0	GWW3	0	0	14
2041	0	0	0	0	200	5	0	0	0	0	0	14
2042	0	0	0	0	200	55	0	0	0	0	0	14
2043	0	0	0	0	600	0	0	0	0	0	0	14
Sub Total	**841**	**261**	**340**	**1,800**	**3,325**	**1,103**	**150**	**200**		**30**	**160**	**360**
Total	**6,888**											

DR Potential - Next Steps

- IRP team will input potential DR programs and costs into AURORA for selection
  - ✓ Outcome will be reviewed at a future IRPAC meeting

Questions/Comments