

Energy Efficiency & Demand Response for the 2022 IRP



Quentin Nesbitt, Customer Research & Analysis Leader

Nov. 10, 2022

Prior Activity



- May 4 Energy Efficiency Subcommittee
 - ✓ Energy Efficiency Advisory Group meeting with IRPAC members invited
 - ✓ Reviewed methodology and draft results of Energy Efficiency (EE) potential study
 - ✓ Described methodology and plan for Demand Response (DR) potential study
 - ✓ Economic EE potential was used to reduce the Load Forecast presented in the previous IRPAC meeting

Potential Study Objectives



- Idaho Power potential studies support demand-side management (DSM) planning efforts for both EE & DR.
- The two primary objectives for the potential studies are:
 - **Program Planning:** provide insights into possible measures or programs
 - **IRP:** long-term forecast of potential for use in the IRP
- AEG (Idaho Power consultant) used its comprehensive analytical models customized to Idaho Power's service area.

AEG Introduction



Eli Morris
Project Director



Neil Grigsby
EE Project Manager



Maggie Buffum
DR Project Manager



Fuong Nguyen
Analysis Lead

West:

Avista Energy *
BPA *
Cascade Natural Gas *
Chelan PUD
Cheyenne LFP *
Colorado Electric *
CowIitz 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

Key

* Two or more studies

Bold = Both Market Assessment and Program Planning & Design work

Italics = Only Program Planning & Design work

As of January 2022

Midwest:

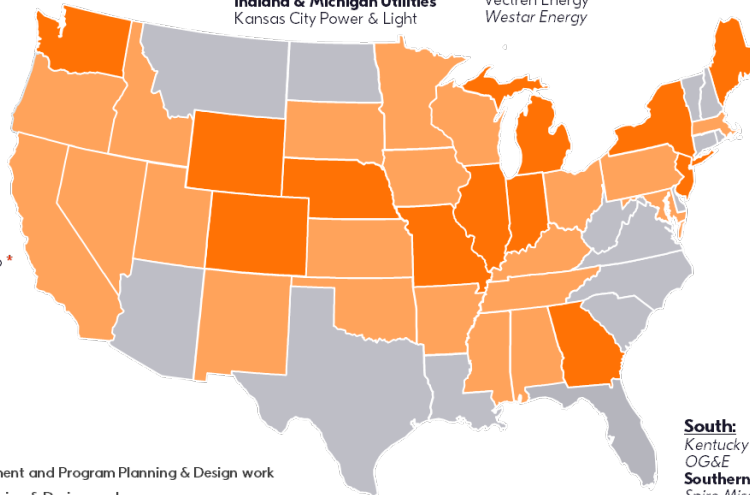
Ameren Illinois *
Ameren Missouri *
Black Hills Power *
Citizens Energy
Empire District Electric *
Indianapolis P&L *
Indiana & Michigan Utilities
Kansas City Power & Light

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

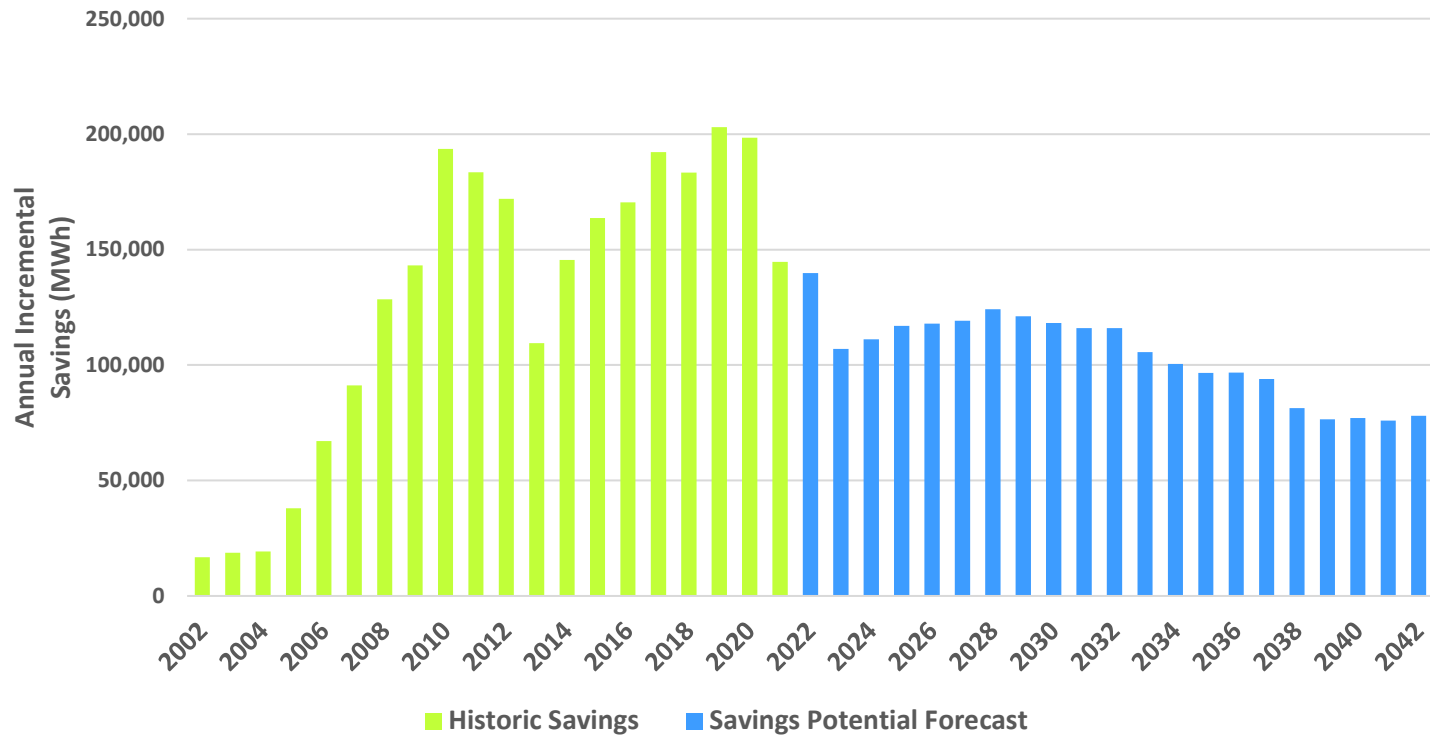
South:

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



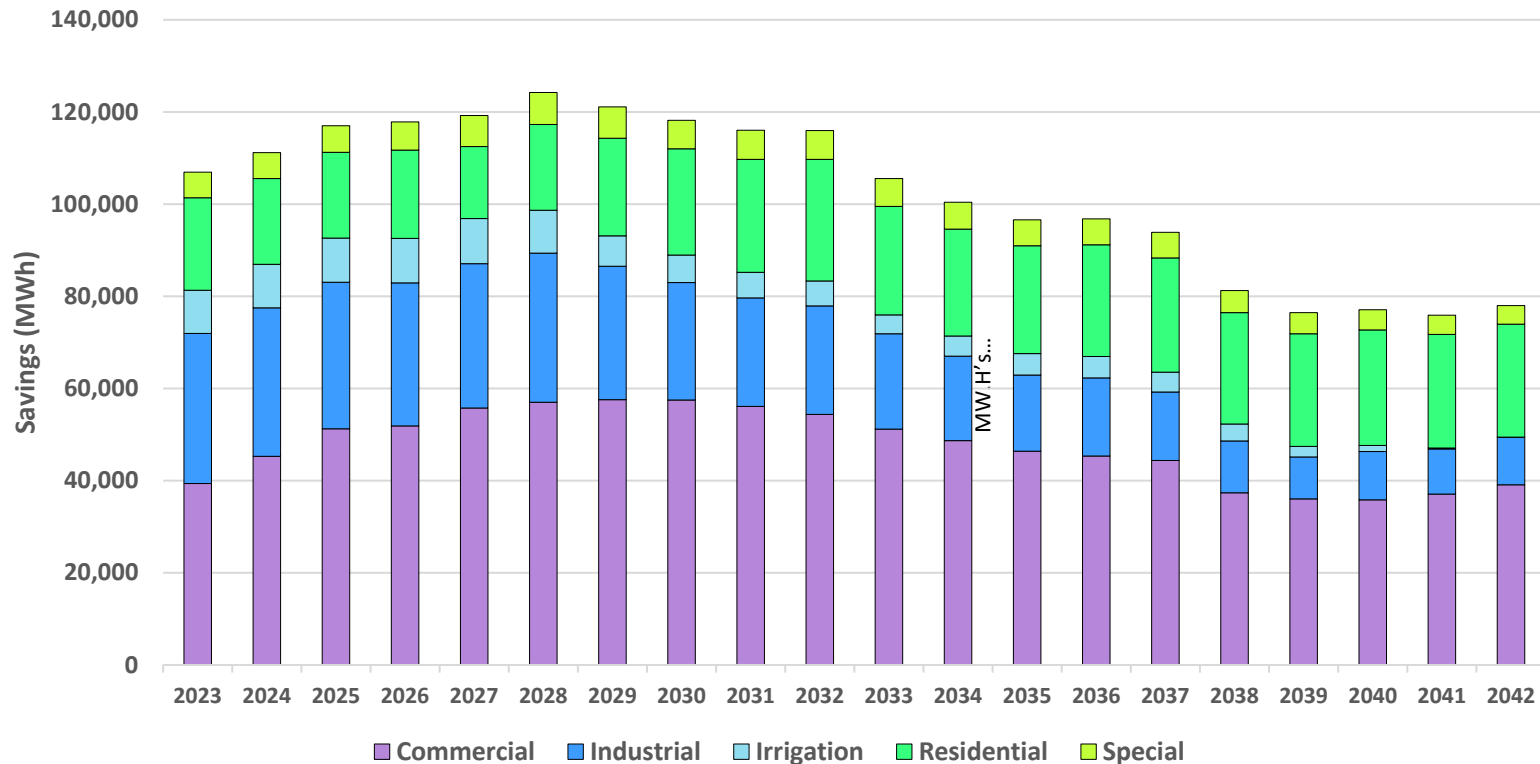
Sixty potential studies in the last 5 years; many of these in the Pacific Northwest

EE Potential Study Results



EE Potential by Sector

Incremental by sector



EE measure that did not meet economic screening

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

EE Potential - Next Steps



- IRP Team will input EE Bundles and prices into AURORA for potential selection as they did for the 2021 IRP.
 - ✓ Outcome to be reviewed at future IRPAC meeting

Demand Response at Idaho Power

- Designed to avoid or delay the need to build new supply-side resources
- **Capacity Resource:** very limited hours; low-cost to have, but not low-cost to use
- Cheaper than building another resource that would only run occasionally
- Need is on extremely hot summer evenings after solar falls off ("net peak")



Idaho Power's Existing Demand Response Programs

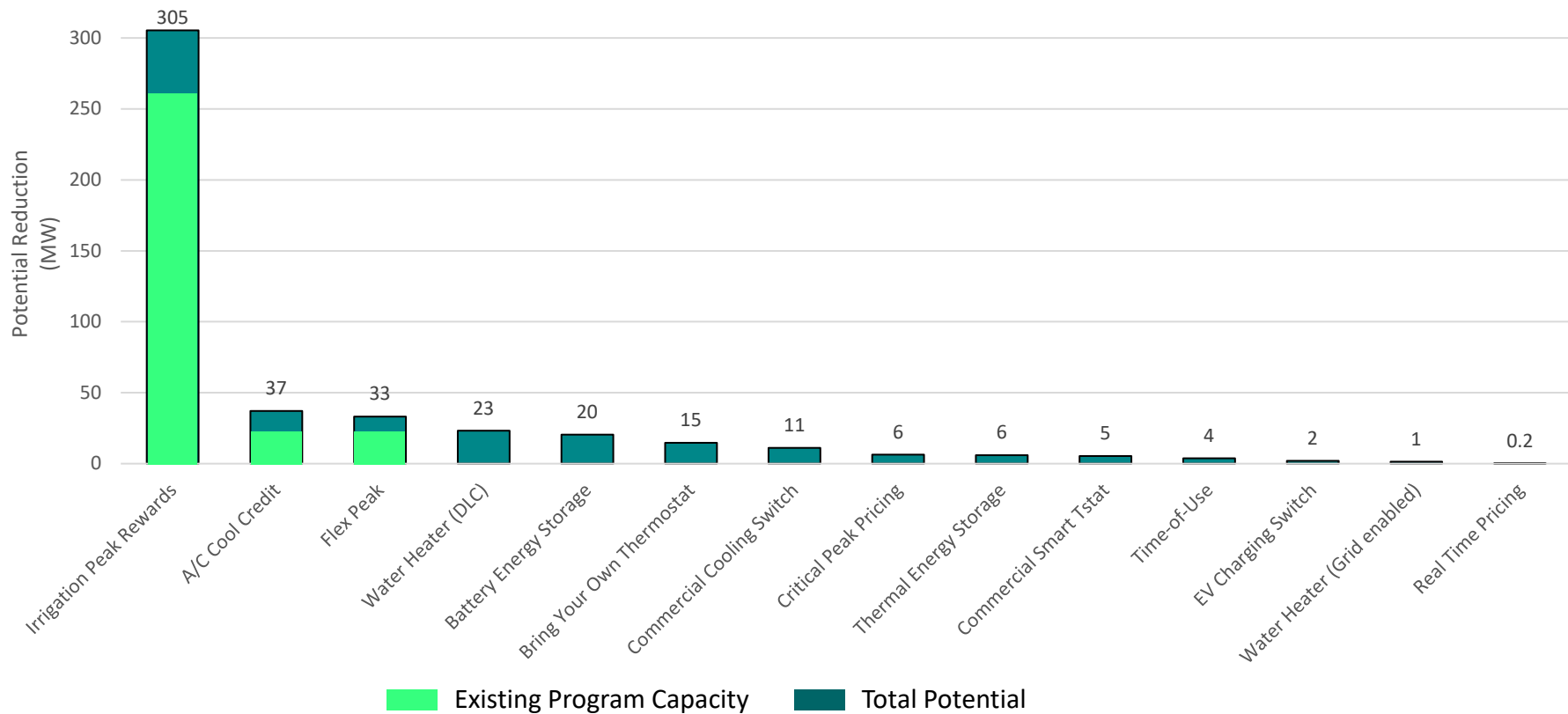
- Irrigation Peak Rewards ~ 262 MW
- Commercial and Industrial Flex Peak ~ 29 MW
- Residential A/C Cool Credit ~ 28 MW



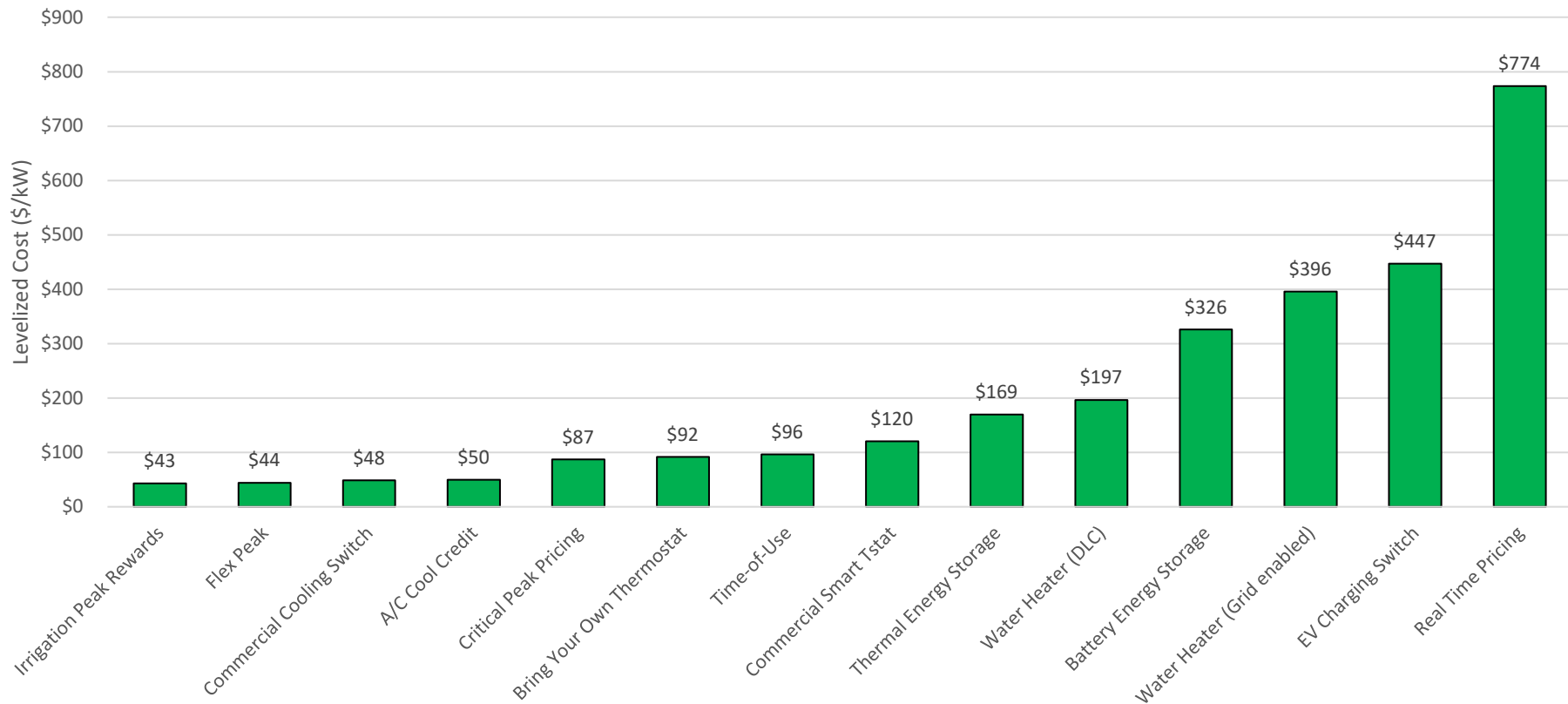
DR Program Options

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		

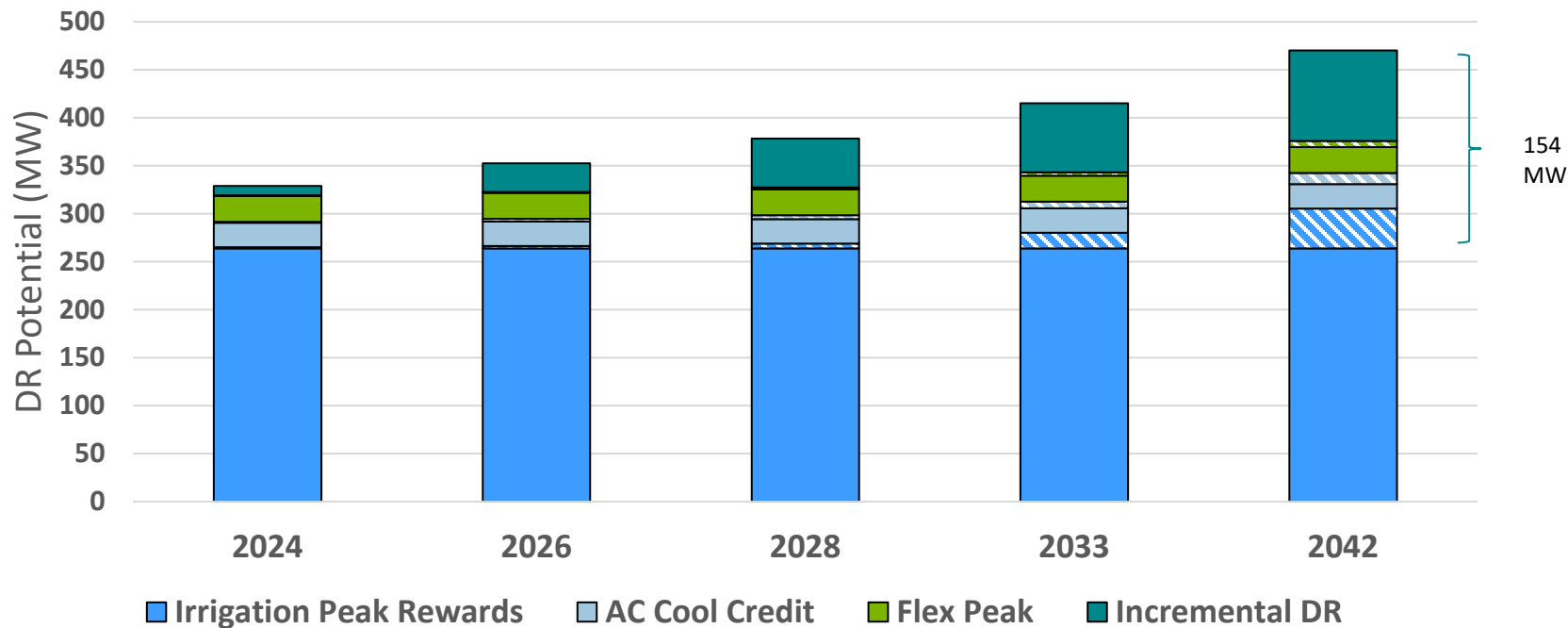
DR Program Potential



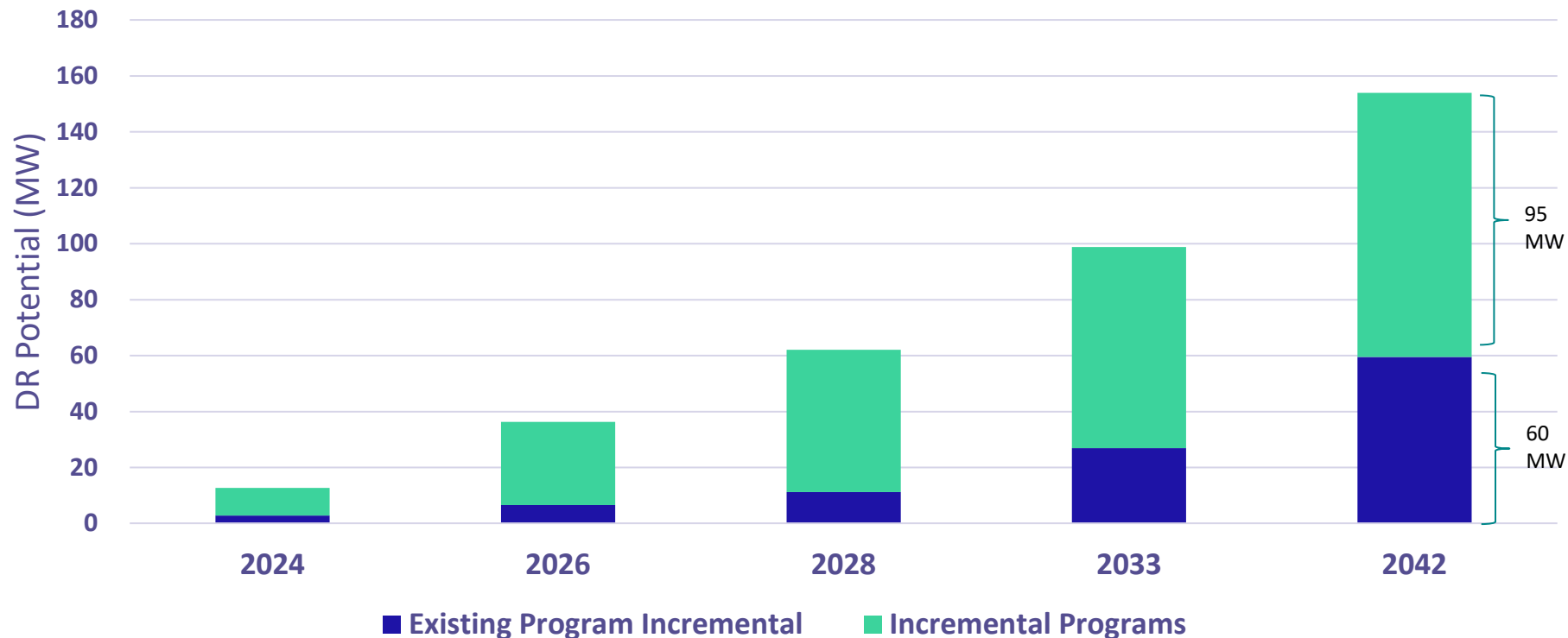
DR Program Estimated Costs



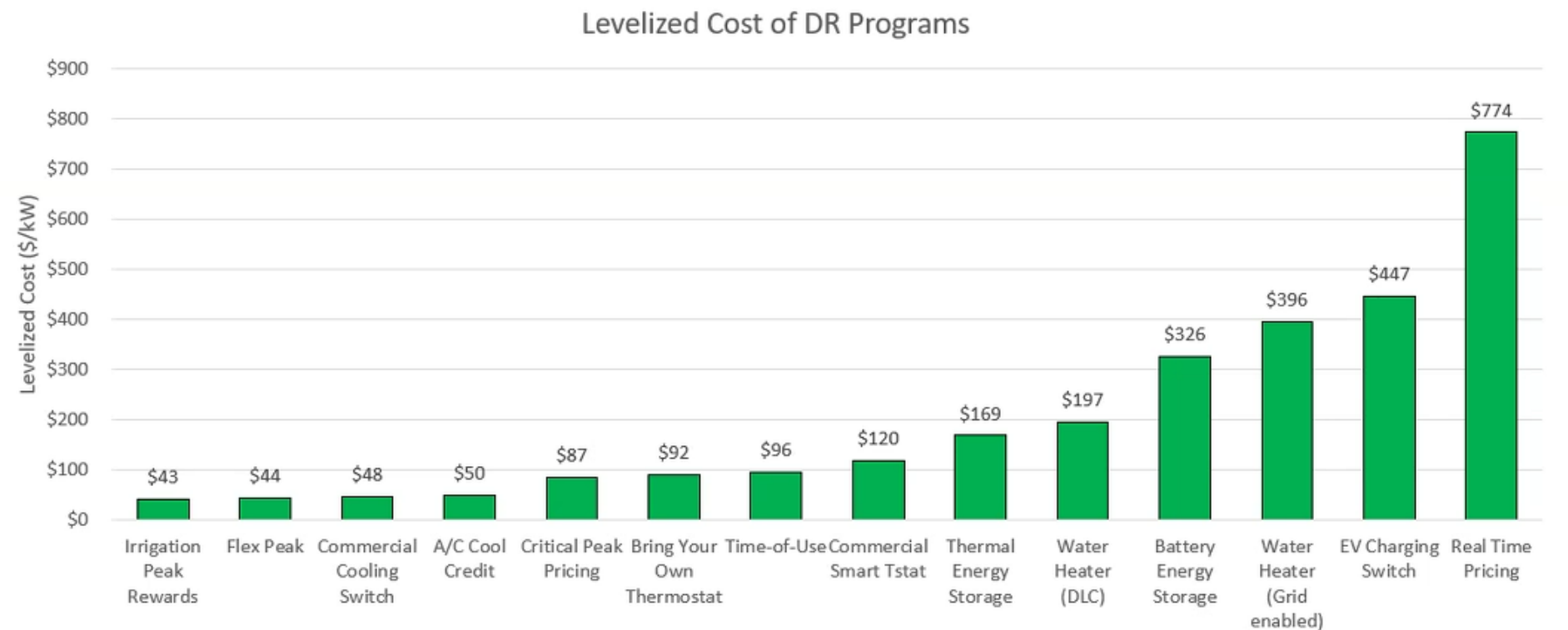
Summer DR Potential



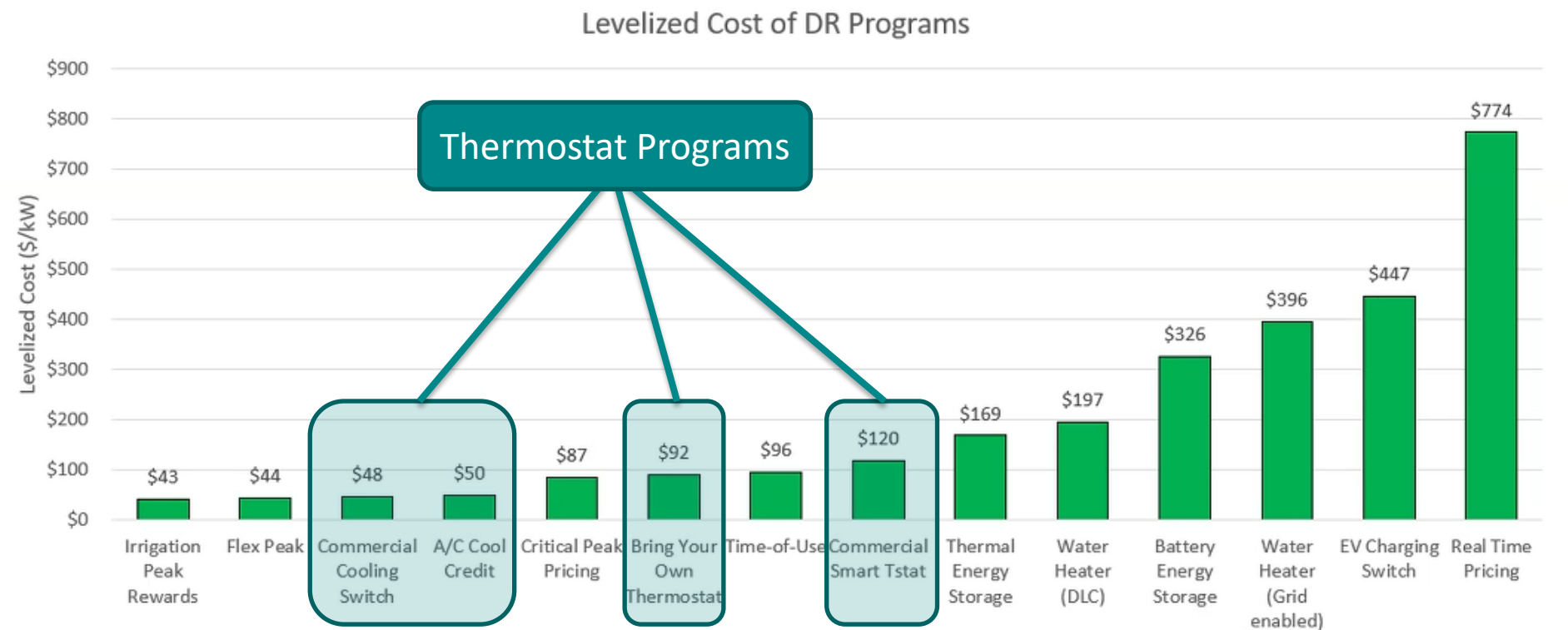
Summer DR Potential (without existing)



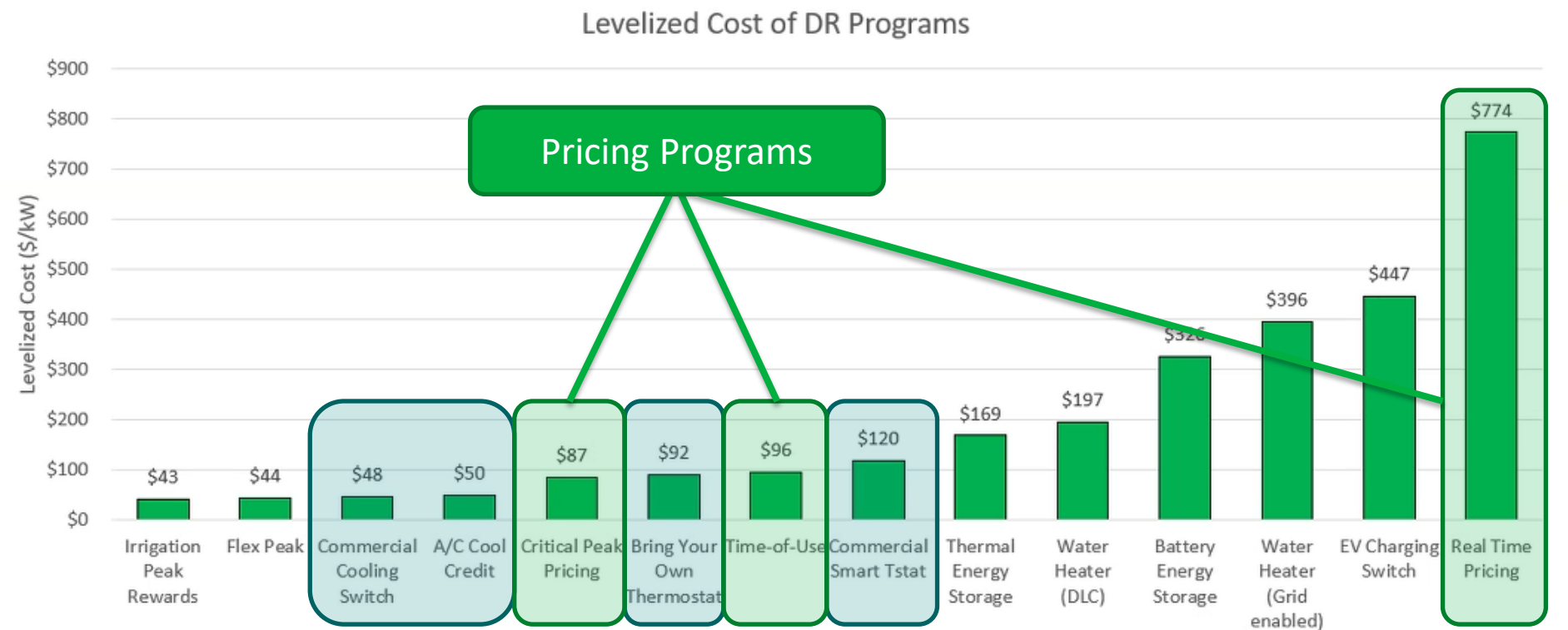
DR Program Estimated Costs



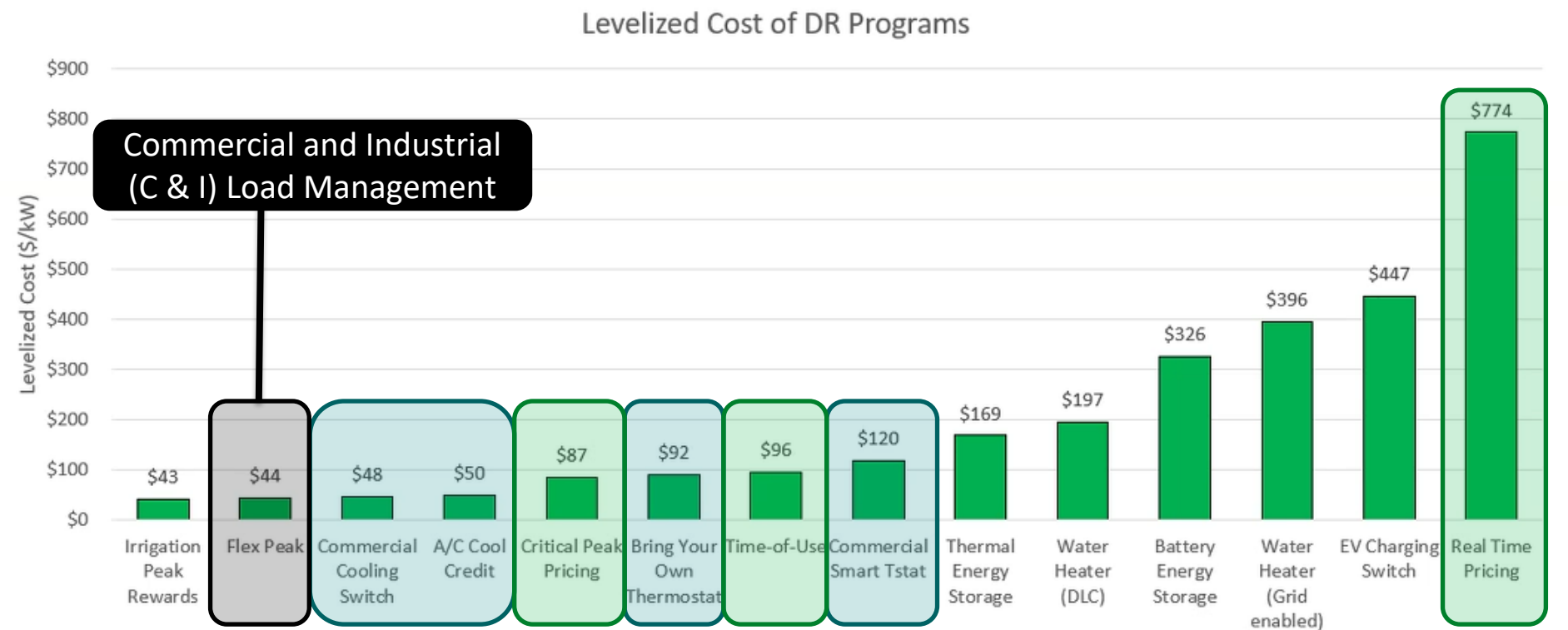
DR Program Estimated Costs



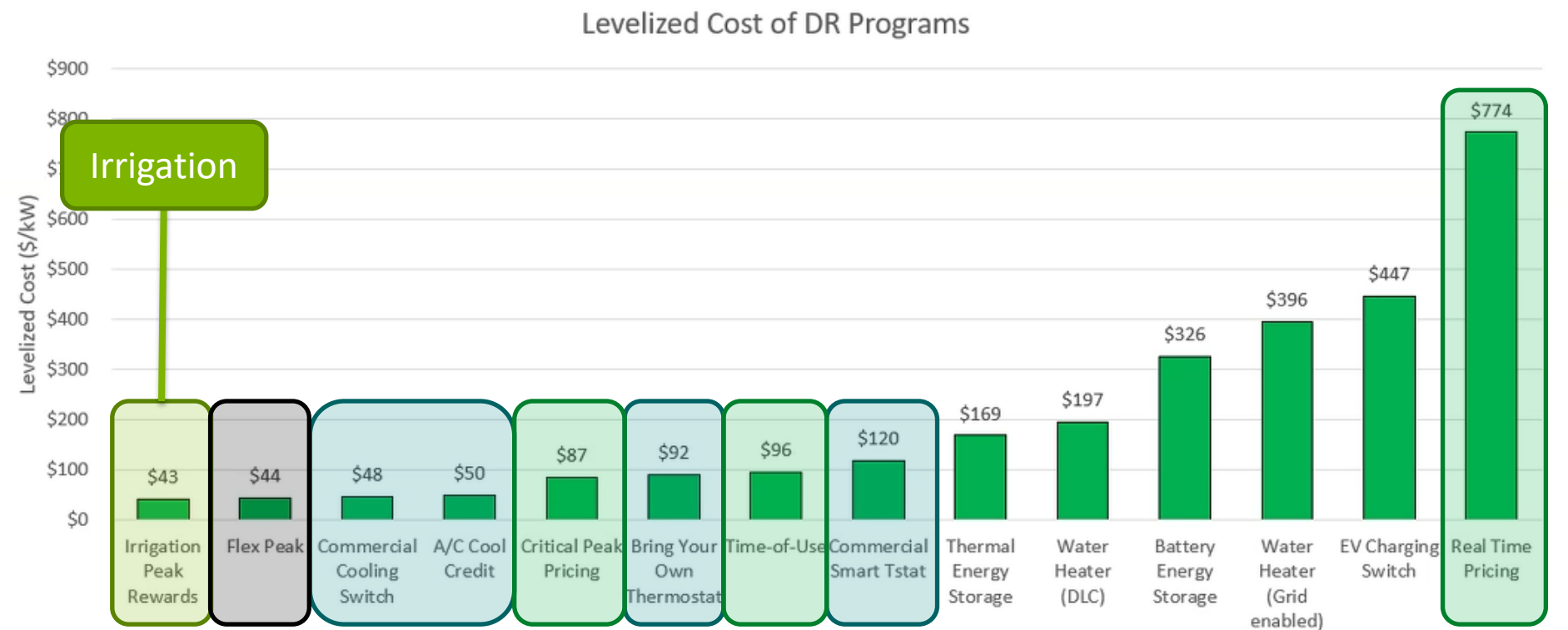
DR Program Estimated Costs



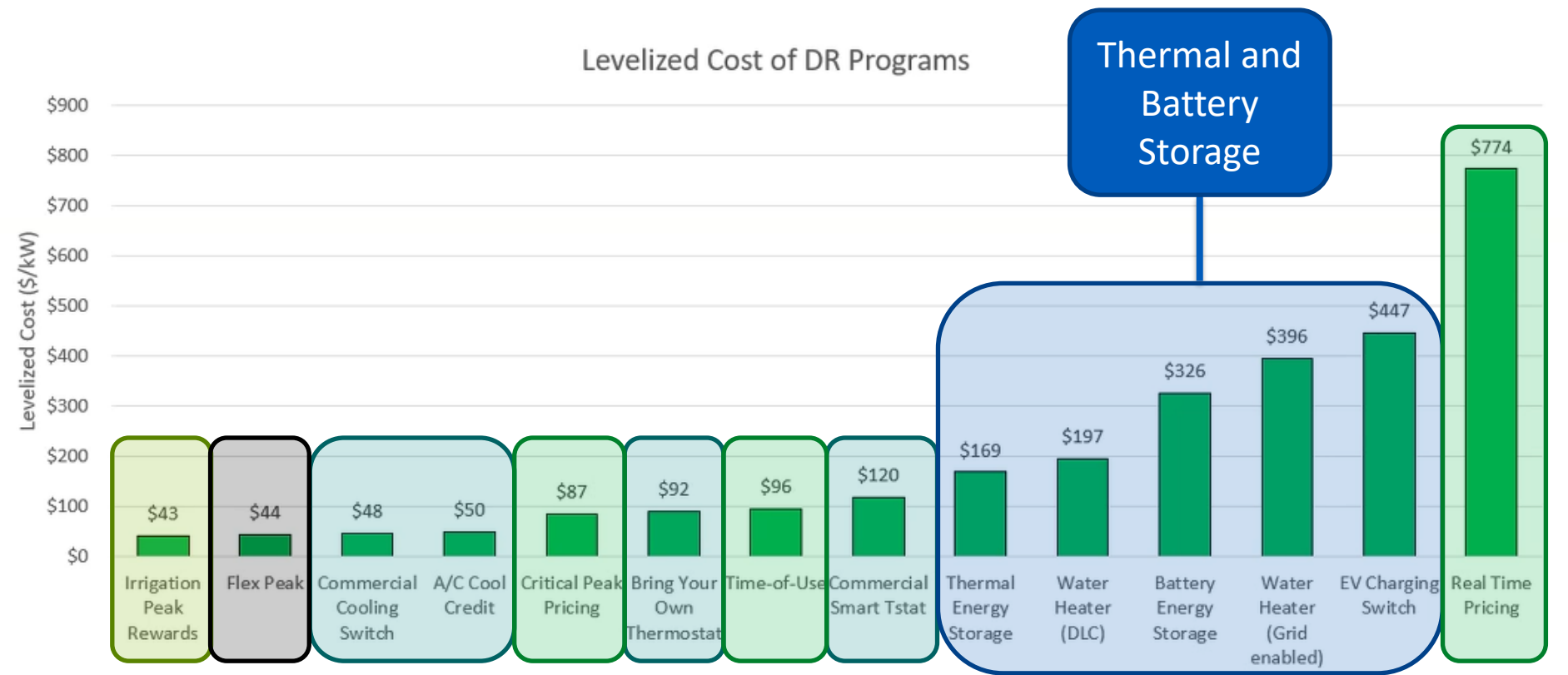
DR Program Estimated Costs



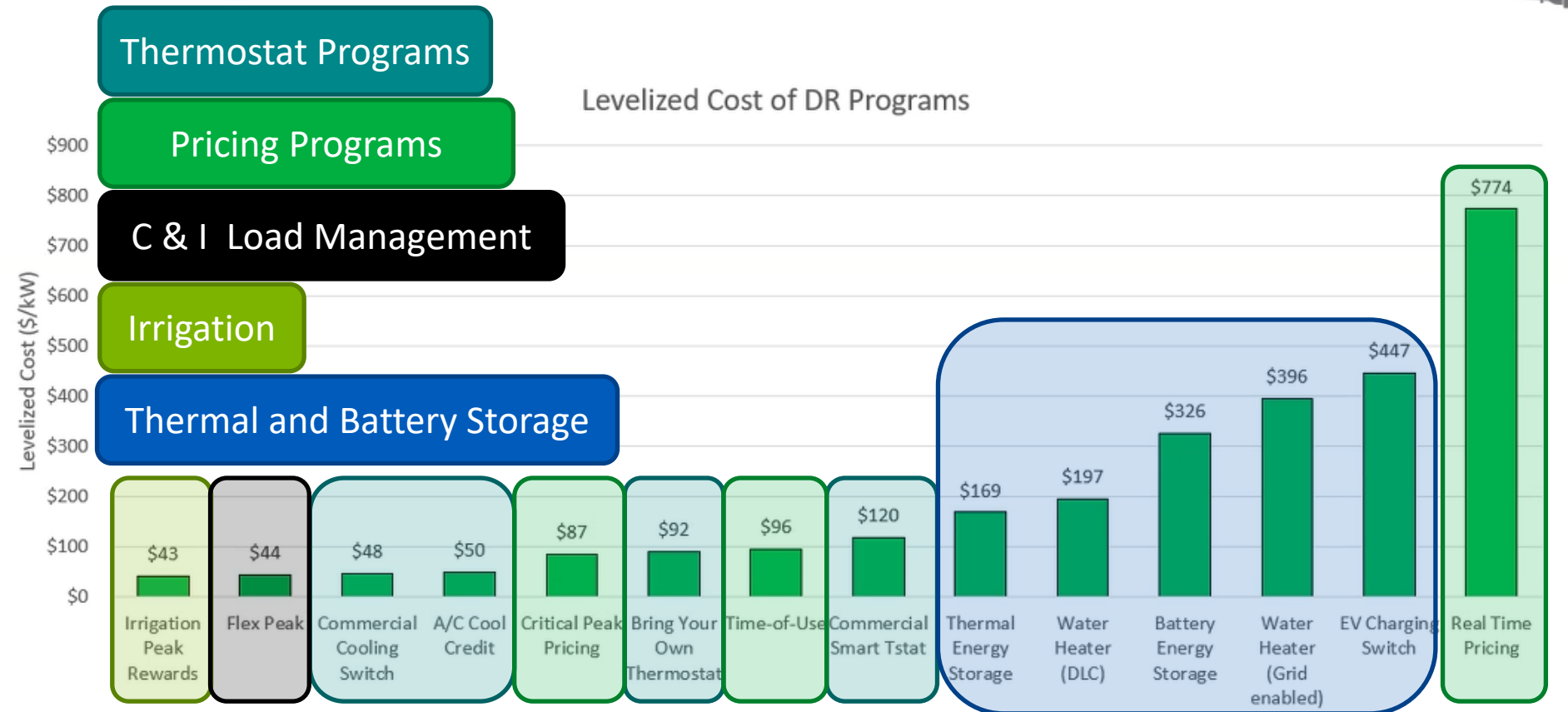
DR Program Estimated Costs



DR Program Estimated Costs



DR Program Estimated Costs



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

