Santee Cooper IRP Stakeholder Process 2024-2026

Market Potential Study Technical Meeting – Meeting Summary

Date: 12/10/2025
Time: 1:30 PM – 3:30 PM EDT
Location: Virtual Meeting via Zoom, Vanry Associates hosting

Topics and Presenters

Santee Cooper Demand Side Management Market Potential Studies: Reviewing Assumptions with Stakeholders

Steven Roys, Manager Program Development, Santee Cooper

Jim Herndon, Vice President - Advisory Services, Resource Innovations

Wenjia Zhu, Lead - Advisory Services, Resource Innovations

Greg Sidorov, Senior Manager - Advisory Services, Resource Innovations

Steven Roys opened the meeting by thanking the group for their feedback and updates that were made following meeting #2 on September 10th of this year. He also went over the timeline, comments received and actions taken. Jim Herndon briefly provided a high-level overview of the assumptions and methodology proposed for the 2026 Market Potential Study (MPS). Wenjia reviewed the assumptions for technical, economic and achievable potentials for energy efficiency. She also presented the base load, low, medium, and high scenario results for the 20-year cumulative achievable potential. Then discussed the top 20 measures for both residential and commercial potentials. Greg Sidorov continued the discussion of measures by going over the binning methodology for the demand response potential studies followed by reviewing the technical, economic and achievable potentials for DR. The slide deck presented at the meeting is attached for reference.

Meeting Action Items

The following is a summary of action items, with status updates if applicable, agreed to at the close of the meeting.

ACTION ITEMS	RESPONSIBLE PARTY
Santee Cooper committed to sharing the DR workbooks with stakeholders within the next few weeks.	Santee Cooper Program Management
Santee Cooper requested feedback from stakeholders on the information presented, the DR workbooks and the proposed schedule by 12/31/2025.	All Stakeholders

Santee Cooper DSM MPS

Stakeholder Meeting – Achievable Potential

December 10, 2025

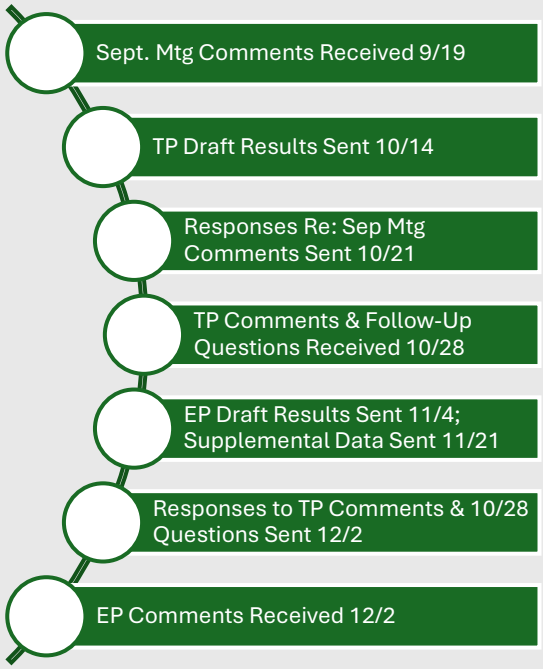
Steven Roys - Manager Program Development
Jim Herndon - Vice President, Utility Services (Resource Innovations)
Wenjia Zhu – Senior Consultant, Utility Services (Resource Innovations)
Greg Sidorov – Senior Manager, Utility Services (Resource Innovations)

Meeting Agenda

- Introductions
- Stakeholder Engagement
  - Comments and follow-ups from the Sept meeting
  - Review of technical and economic potential
- Achievable Potential
  - Energy Efficiency
  - Demand Response

Comments and Actions Taken

- Updated Assumptions for Load Disaggregation
  - Residential space cooling: Differentiated energy intensity growth rates by equipment type
  - Motors, fans, and blowers: Adjusted end-use assumptions to ensure increasing trends over time
- Updated Assumptions for Measures
  - EFLH values: Adjusted proportionally using the HDD/CDD ratios for Mario, IL (Mixed-Humid) and Florence, SC (Warm-Humid)
  - Cooling tonnage for mobile homes: Revised from 3 tons to 2.5 tons
  - Efficiency assumptions: Incorporated updates from the *2023 Pennsylvania Baseline Study*



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Review of TP and EP

	Residential	Commercial	New Technology EVs	System
2026 Base Load (MWh)	2,171,150	1,962,867	32,174	4,166,191
20-Year Cumulative **Technical** Potential Savings (MWh), *% of first-year base load*	760,482 *35%*	484,264 *25%*	5,696 *18%*	1,250,442 *30%*
20-Year Cumulative **Economic** Potential Savings (MWh), *% of first-year base load*	606,926 *28%*	396,087 *20%*	5,696 *18%*	1,008,709 *24%*

- Technical Potential
  - Results shared on 10/14
  - Feedback received on 10/28, and responses provided on 12/2
- Economic Potential
  - Results shared on 11/4
  - Feedback received on 12/2 and responses to be discussed today

Review of Assumptions

- Technical Potential
  - Represents the theoretical maximum savings potential from energy efficiency measures within Santee Cooper's service territory
  - For the same technology with multiple efficiency level, the savings potential is attributed to the one with highest efficiency level
- Economic Potential
  - Represents the savings potential that is cost-effective from the utility's perspective
  - Uses the Utility Cost Test (UCT) to screen measures
  - To incorporate customer's perspective, we assume the savings potential corresponds to the measure with the shortest simple payback among competing measures. [ASHP Example – competing measures will split the market share in AP]
- Achievable Potential
  - Represents a more realistic, achievable savings potential that incorporates customer's perspective
  - Applies more detailed program administrative costs for the measures and reduces UCT threshold for Med & High scenarios as proxy for program-level screening
  - Adjusts assumed adoption from 100% to the long-run market share based on payback acceptance curves

Achievable Potential Scenarios

Summary of 20-Year Cumulative AP Results by Scenario *(w. Roll-Off)*

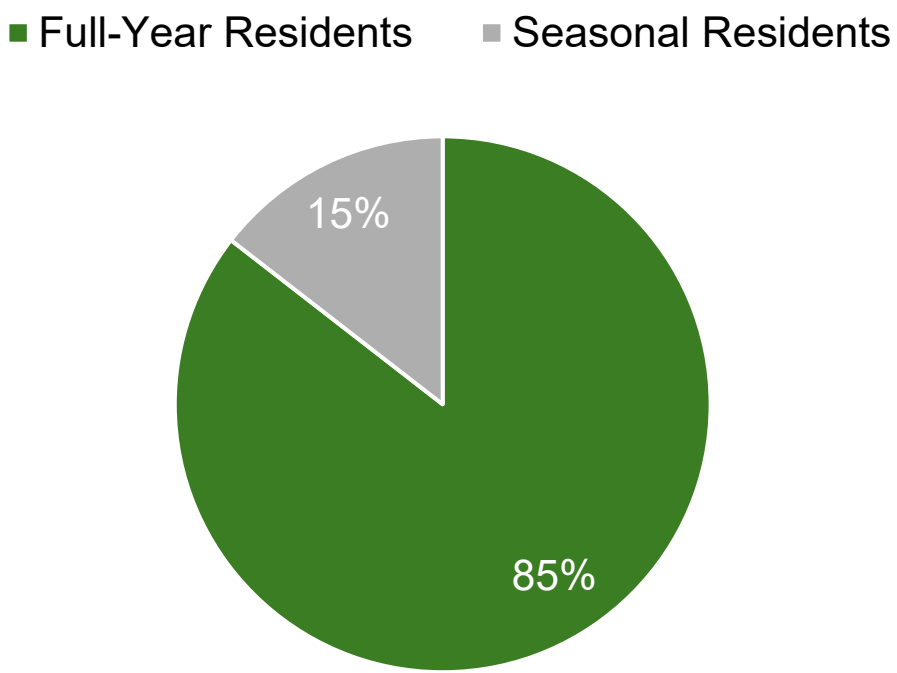
	Residential	Commercial	New Technology EVs	System
2026 Base Load (MWh)	2,171,150	1,962,867	32,174	4,166,191
Low Scenario AP (MWh), *% of first-year base load*	69,793 *3%*	135,595 *7%*	0.38 *0%*	205,389 *5%*
Med Scenario AP (MWh), *% of first-year base load*	86,126 *4%*	172,182 *9%*	36 *0.1%*	258,345 *7%*
High Scenario AP (MWh), *% of first-year base load*	177,701 *8%*	258,997 *13%*	36 *0.1%*	436,734 *10%*

- Low/Base Scenario: Incentives of 30% of the incremental costs, measures are screened at UCT ≥ 1.0;
- Medium Scenario: Incentives are increased up to 50% of the incremental costs*, UCT threshold is reduced to 0.7 as proxy for program-level screening;
- High Scenario: Incentives are increased up to 75% of the incremental costs*, UCT threshold is reduced to 0.7, Avoided marginal energy costs are increased by 50%.

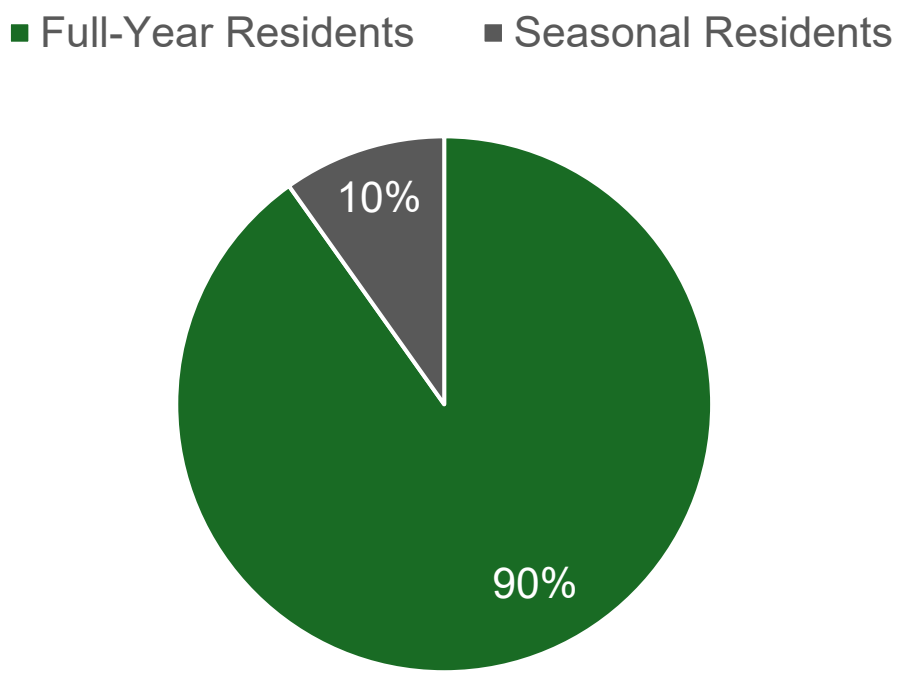
* Incentive rates for individual measures will be capped to maintain passing UCT result, if less than targeted rate.

Residential Potential by Segment

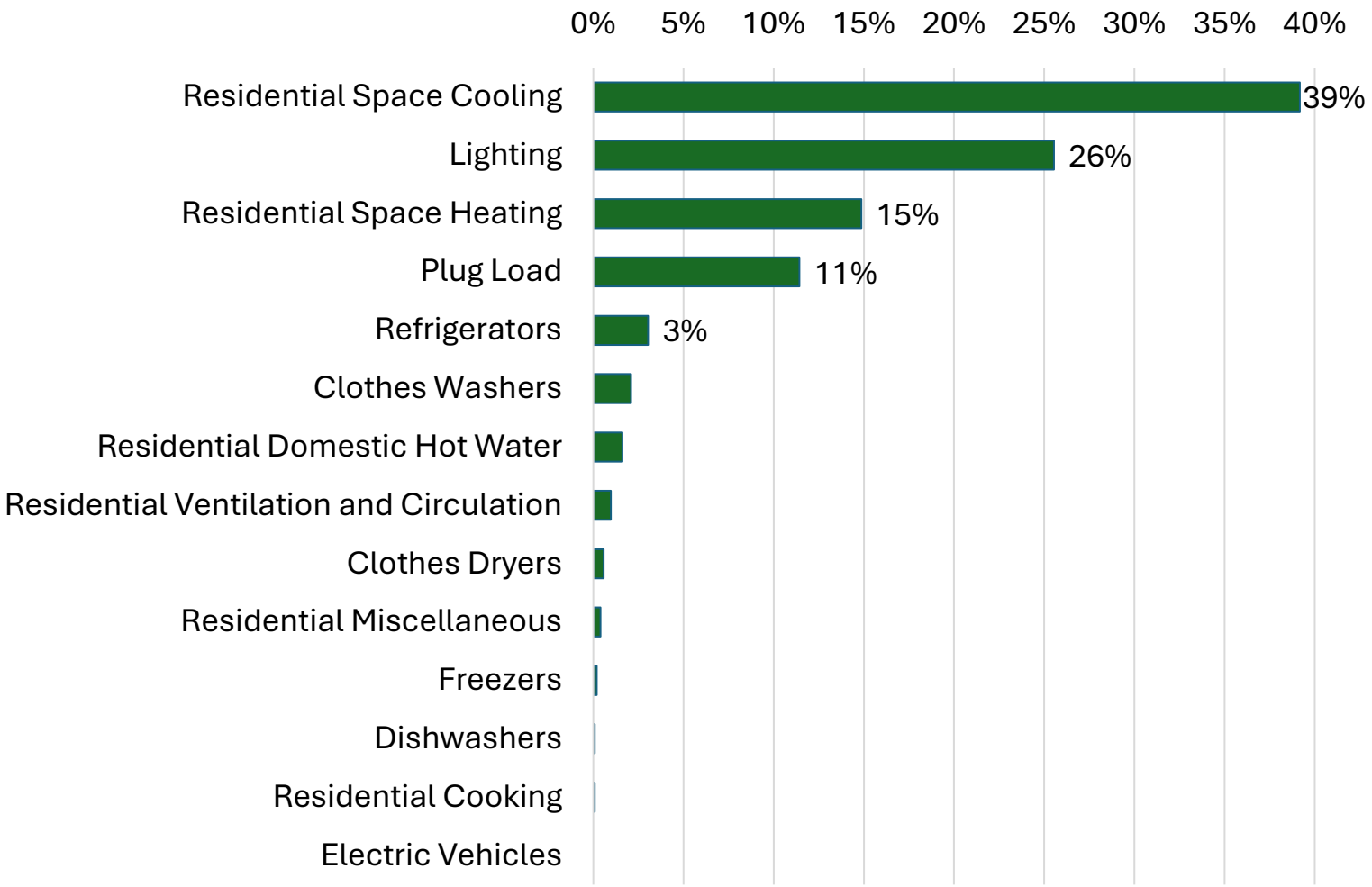
Start-Year Sales by Occupancy Status



Potential by Occupancy Status



Residential Potential by End Use



- The top five end uses contribute 94% of residential savings opportunities.
  - Residential Space Cooling
  - Lighting
  - Residential Space Heating
  - Plug Load
  - Refrigerators
- We expect fewer savings opportunities from the water heating end use due to new federal regulations. Updated DOE energy conservation standards for residential water heaters will take effect on May 6, 2029.

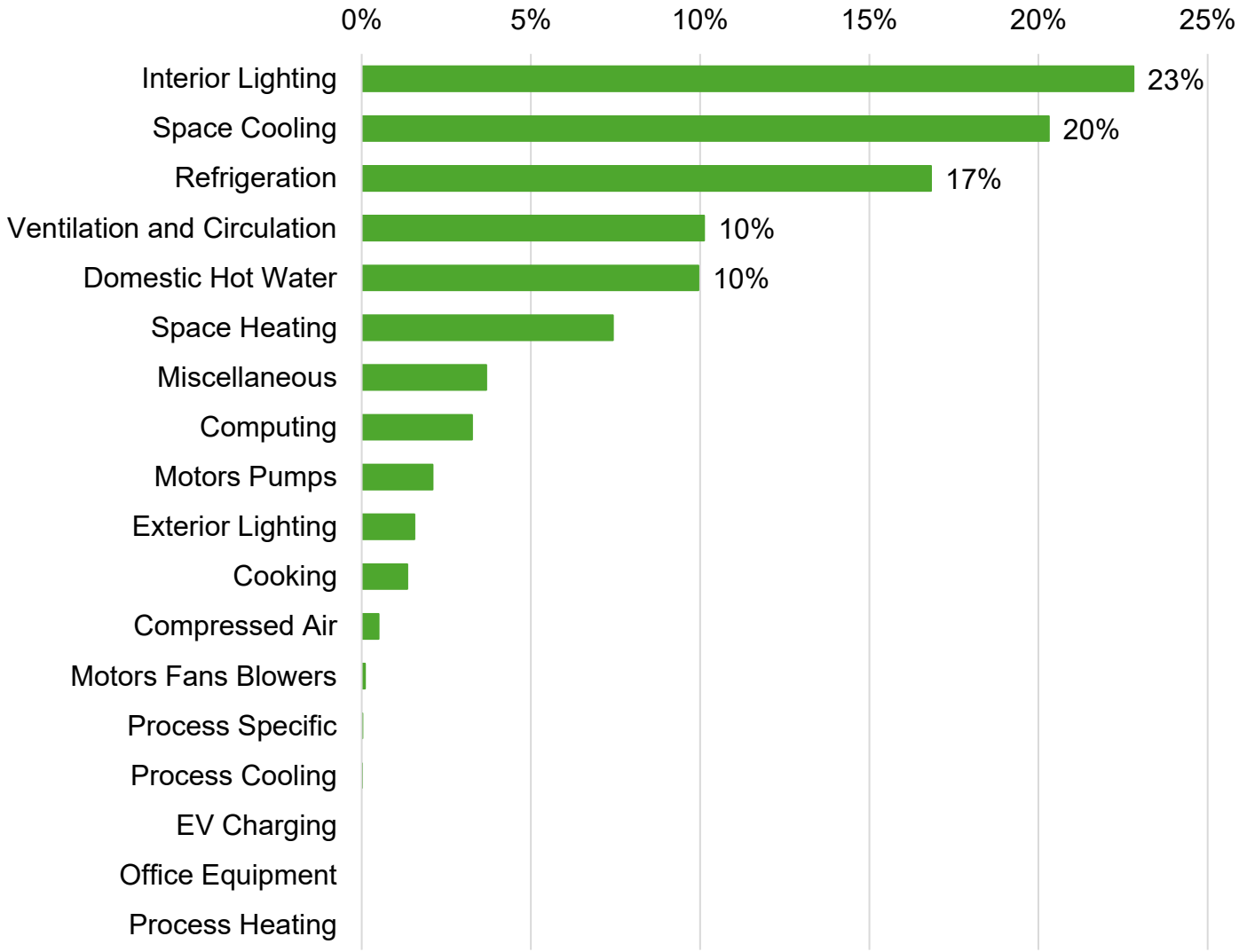
Top 20 Residential Measures

Measure Name (Top 1-10)	Cumulative Savings 2026-2045 (MWh)
ASHP - **All SEER Levels**	18,884
Programmable & Smart Thermostats	9,188
ENERGY STAR LED_ 13W_CFL Baseline	5,797
ENERGY STAR LED_ 9W_CFL Baseline Residential	5,271
ENERGY STAR LED_ 6W_CFL Baseline	3,461
Energy Star Television	3,144
Energy Star Air Purifier	2,614
Central AC - **All SEER Levels**	2,332
Occupancy Sensors Switch Mounted	2,128
Properly Sized CAC	1,875

Measure Name (Top 11-20)	Cumulative Savings 2026-2045 (MWh)
Air Sealing_Lower Baseline	1,842
RealTime Information Monitoring Residential	1,698
Energy Star Desktop Computer	1,646
Energy Star Clothes Washer	1,256
Energy Star Door	1,055
Energy Star LED Directional Lamp Residential	950
Refrigerator Recycling	940
Thermostatic Shower Restriction Valve	818
CEE Tier 3 Refrigerator	633
Duct Sealing	540

Approximately 77 of 109 measures pass the economic screening and are included in the low/base scenario. The tables present the top 20 measures with the highest cumulative savings over the 20-year study period, representing 95% of the total savings opportunities.

Commercial Potential by End Use



- The top five end uses contribute 80% of commercial savings opportunities.
  - Interior Lighting
  - Space Cooling
  - Refrigeration
  - Ventilation and Circulation
  - Domestic Hot Water
- The savings opportunities correlate with the end-use sales distribution from the load disaggregation.

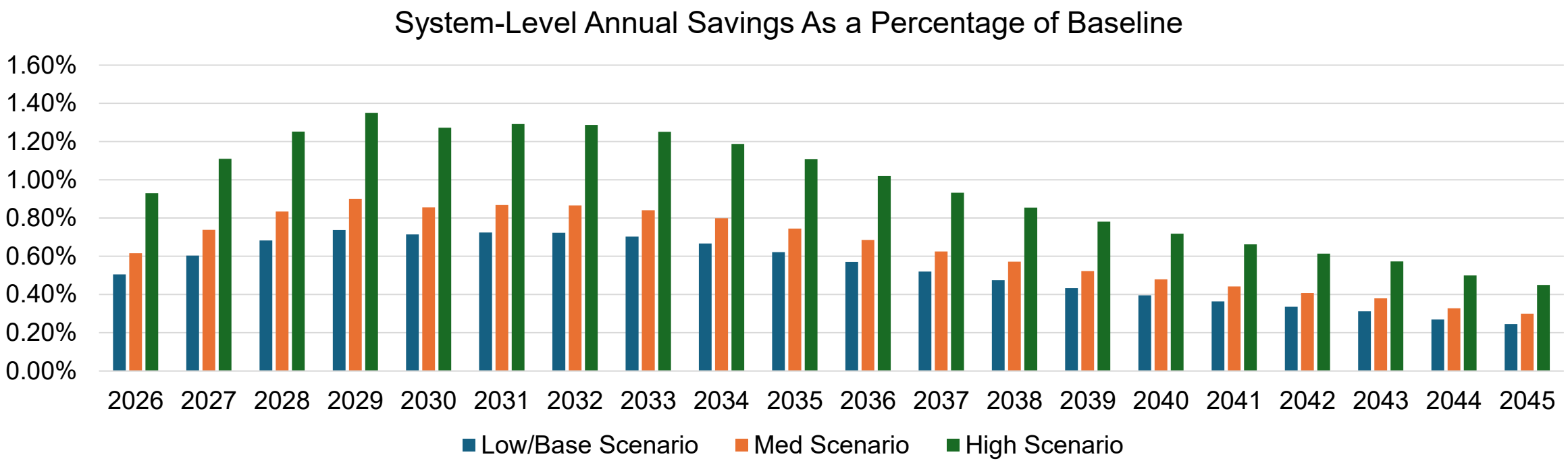
Top 20 Commercial Measures

Measure Name (Top 1-10)	Cumulative Savings 2026-2045 (MWh)
LED Linear - Lamp Replacement Commercial	13,626
VFD on HVAC Fan Commercial	12,293
Programmable thermostat Commercial	7,991
Refrigeration Economizer	7,800
1.5 GPM Low-Flow Showerhead	6,450
Ceiling Insulation R49	5,112
Energy Star PCs-Desktop	4,413
Indoor daylight sensor Commercial	4,346
High Efficiency PTHP	4,147
Time Clock Control Commercial	3,908

Measure Name (Top 11-20)	Cumulative Savings 2026-2045 (MWh)
Demand Defrost Commercial	3,876
Electric Resistance Water Heater	3,638
Custom measure - Non-lighting Commercial	2,910
High Efficiency PTAC	2,879
Energy Star LED Lamp_ 14W_CFL Baseline Commercial	2,510
Heat Pump Pool Heater Commercial	2,472
RealTime information monitoring	2,354
HE DX 11.25-20.0 Tons Elec Heat Commercial	2,290
Energy Star LED Directional Lamp Commercial	2,229
Heat Pump Water Heater 80 Gallons	2,058

Approximately 174 of 193 measures pass the economic screening and are included in the low/base scenario. The tables present the top 20 measures with the highest cumulative savings over the 20-year study period, representing 72% of the total savings opportunities.

Annual Savings by Scenario

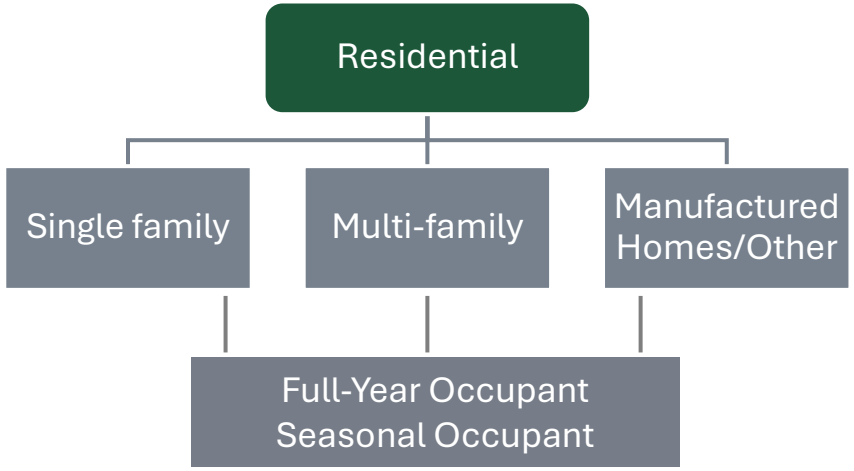


DR Segmentation

Within **sector** we further group into **segments** based on account characteristics

Estimate potential independently within each sector, segment

Residential
Building type, Occupancy



Commercial
Small Commercial (GA) – Energy Consumption
Large Commercial (GB and GL) – Peak Demand

	Small Commercial	Large Commercial
Segment 1	< 5,000 kWh	< 200 kW
Segment 2	5,000-10,000 kWh	200-500 kW
Segment 3	10,000-25,000 kWh	500-1,000 kW
Segment 4	> 25,000 kWh	> 1,000 kW

DR Measures

DR Measure List

Measure Category	Measure Name	Applicable End Use	Occupancy
Large Commercial	Contractual DR	N/A	N/A
	Automated DR	N/A	N/A
	Emergency Load Reduction	N/A	N/A
DLC (Residential + Small Commercial)	Battery Storage	N/A	Full, Seasonal
	EV Charging (Telematics)	EV	Full
	EV Charging (Switch)	EV	Full
	HVAC - Cooling (Switch)	Cooling	Full, Seasonal
	HVAC - Heating (Switch)	Heating	Full, Seasonal
	Room AC Control	Cooling	Full
	Pool Pump (Switch)	Pool Pump	Full, Seasonal
	Smart Thermostat - BYOT	Cooling, Heating	Full, Seasonal
	Smart Thermostat - Utility Install	Cooling, Heating	Full, Seasonal
	Water Heat (Switch)	Water Heat	Full, Seasonal
	Water Heat (Grid-Enabled)	Water Heat	Full, Seasonal
Pricing (Residential + Small Commercial)	Critical Peak Pricing	N/A	Full
	Peak Time Rebates	N/A	Full
	Real Time Pricing	N/A	Full
	Behavioral Demand Response (BDR)	N/A	Full

- DR measure list
  - Santee Cooper shared with stakeholders in May 2025
  - We are incorporating suggestions and feedback
- Some DR measures
  - require end-use load shapes to derive amount of controllable load
  - not applicable to seasonal occupants

Binning Measures for Mutual Exclusivity

- Some DR measures are competing in nature because they target the same end use loads
- We group measures by underlying end-use load to avoid double-counting in DR potential
- Smart thermostats may affect both cooling and heating
- Pricing measures are cross-cutting
  - May influence multiple end uses

End Use Category	Competing Measures	Notes
Air Conditioning (Summer)	HVAC - Cooling (Switch) Room AC Control Smart Thermostats - Utility Installation Smart Thermostats - BYOT Peak Time Rebates *Critical Peak Pricing *Real Time Pricing	*Pricing programs are cross-end-use, but HVAC is usually the largest source of their DR impact in residential and small commercial
Space Heating (Winter)	HVAC - Heating (Switch) Smart Thermostats - Utility Installation Smart Thermostats - BYOT Peak Time Rebates *Critical Peak Pricing *Real Time Pricing	*Pricing programs are cross-end-use, but HVAC is usually the largest source of their DR impact in residential and small commercial
Water Heating	Water Heat (Switch) Water Heat (Grid-Enabled)	Same load, two control modalities
EV Charging	EV Charging (Telematics) EV Charging (Switch)	Same load, two control modalities
Large Commercial	Automated DR Contractual DR Emergency Load Reduction	Mutually exclusive at site-level Do not compete with small commercial measures
Standalone Measures	*Pool Pump (Switch)* *Battery Storage*	*Do not compete with other DR measures*

DR Technical Potential

Residential Segment	Summer Peak Demand (MW)	Winter Peak Demand (MW)
Single Family	624.84	646.56
Multi-family	346.32	332.81
MH/Other	145.11	139.66

Small Commercial Segment	Summer Peak Demand (MW)	Winter Peak Demand (MW)
< 5,000 kWh	7.33	5.53
5,000 to 10,000 kWh	14.48	12.09
10,000 to 25,000 kWh	53.97	45.09
> 25,000 kWh	225.32	144.81

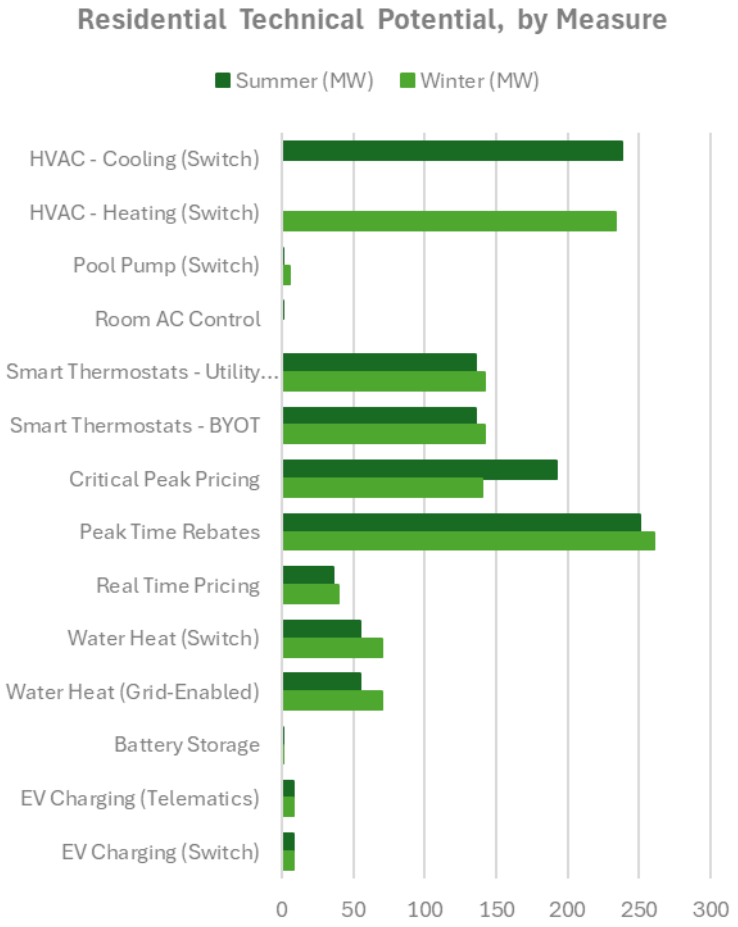
Large Commercial Segment	Summer Peak Demand (MW)	Winter Peak Demand (MW)
< 200 kW	99.03	51.83
200 to 500 kW	89.37	51.33
500 to 1,000 kW	49.53	28.43
> 1,000 kW	27.34	16.51

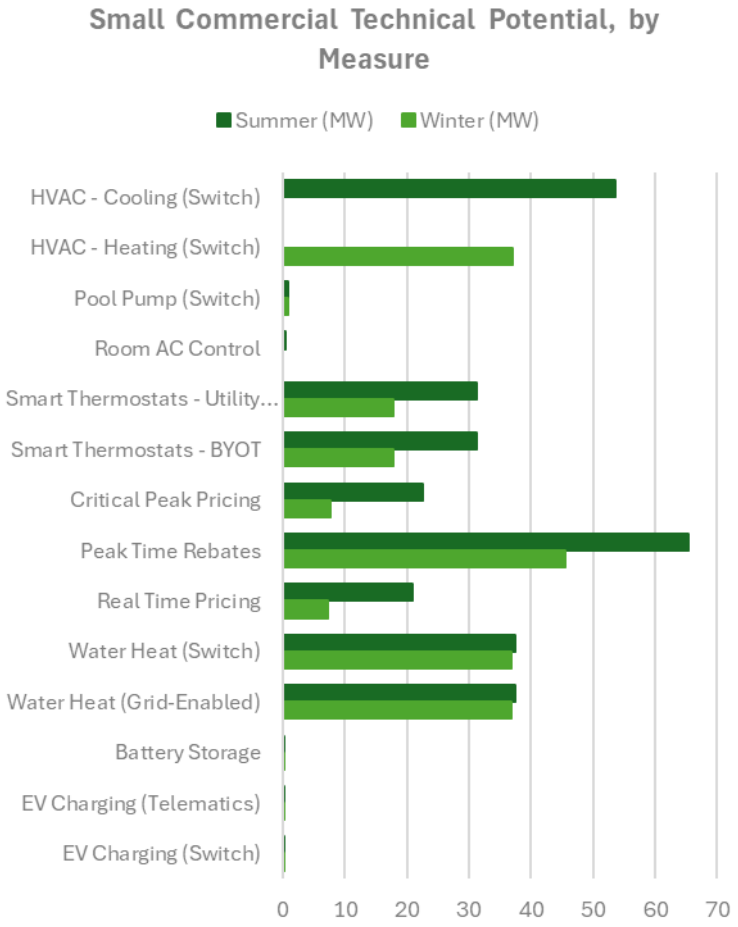
Residential Measure	Summer Potential (MW)	Winter Peak Demand (MW)
HVAC - Cooling (Switch)	238.25	0.00
HVAC - Heating (Switch)	0.00	233.66
Pool Pump (Switch)	1.16	5.13
Room AC Control	1.00	0.00
Smart Thermostats - Utility Install	136.00	141.78
Smart Thermostats - BYOT	136.00	141.78
Critical Peak Pricing	192.29	140.41
Peak Time Rebates	250.32	260.95
Real Time Pricing	35.61	39.49
Water Heat (Switch)	54.62	69.71
Water Heat (Grid-Enabled)	54.62	69.71
Battery Storage	0.78	0.78
EV Charging (Telematics)	7.81	7.81
EV Charging (Switch)	7.81	7.81

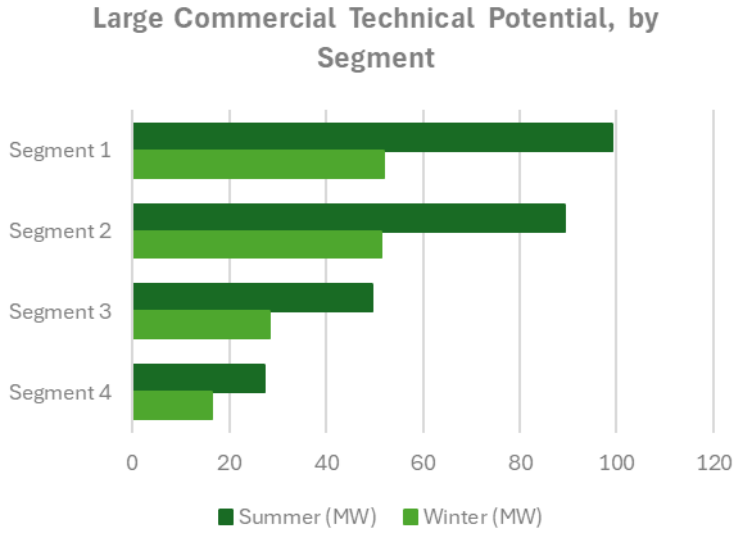
Small Commercial Measure	Summer Potential (MW)	Winter Potential (MW)
HVAC - Cooling (Switch)	53.55	0.00
HVAC - Heating (Switch)	0.00	36.93
Pool Pump (Switch)	0.81	0.81
Room AC Control	0.36	0.00
Smart Thermostats - Utility Install	31.35	17.80
Smart Thermostats - BYOT	31.35	17.80
Critical Peak Pricing	22.59	7.76
Peak Time Rebates	65.30	45.60
Real Time Pricing	20.86	7.21
Water Heat (Switch)	37.47	36.80
Water Heat (Grid-Enabled)	37.47	36.80
Battery Storage	0.28	0.28
EV Charging (Telematics)	0.04	0.04
EV Charging (Switch)	0.04	0.04

Large Commercial Measure	Summer Potential (MW)	Winter Potential (MW)
Automated DR	265.27	148.11
Contractual DR	265.27	148.11
Emergency Load Reduction	265.27	148.11

DR Technical Potential







DR Economic Potential

- Cost-effectiveness screening for determines whether the benefits of enrolling a marginal customer for a given customer segment into a demand response program will outweigh the costs.
- Considers whether a marginal customer for a given customer segment is worth pursuing for participation in the program.
- Ignores the participation rate in the program (this is considered when determining the achievable potential)
- Each measure was screened using the 2026 avoided capacity forecast
- Economic screening does not include programmatic start-up costs - screening is at the measure level

DR Measure	Residential Screen	Small Commercial Screen	Large Commercial Screen
HVAC - Cooling (Switch)	0.98	1.35	N/A
HVAC - Heating (Switch)	1.02	0.95	N/A
Pool Pump (Switch)	1.18	1.10	N/A
Room AC Control	0.72	0.39	N/A
Smart Thermostat - BYOT	2.76	2.52	N/A
Smart Thermostat - Utility Install	2.20	1.96	N/A
Water Heat (Grid-Enabled)	1.37	1.42	N/A
Water Heat (Switch)	0.28	0.82	N/A
Critical Peak Pricing	17.99	4.36	N/A
Peak Time Rebates	16.69	10.20	N/A
Real Time Pricing	3.44	4.03	N/A
Battery Storage	1.70	2.63	N/A
EV Charging (Switch)	0.74	0.04	N/A
EV Charging (Telematics)	0.85	0.04	N/A
Behavioral DR	3.70	N/A	N/A
Automated DR	N/A	N/A	5.26
Contractual DR	N/A	N/A	5.26
Emergency Load Reduction	N/A	N/A	5.26

DR Achievable Potential Scenarios

AP incorporates expected market response to cost-effective measures

- Technology adoption, program enrollment, marketing & customer acquisition

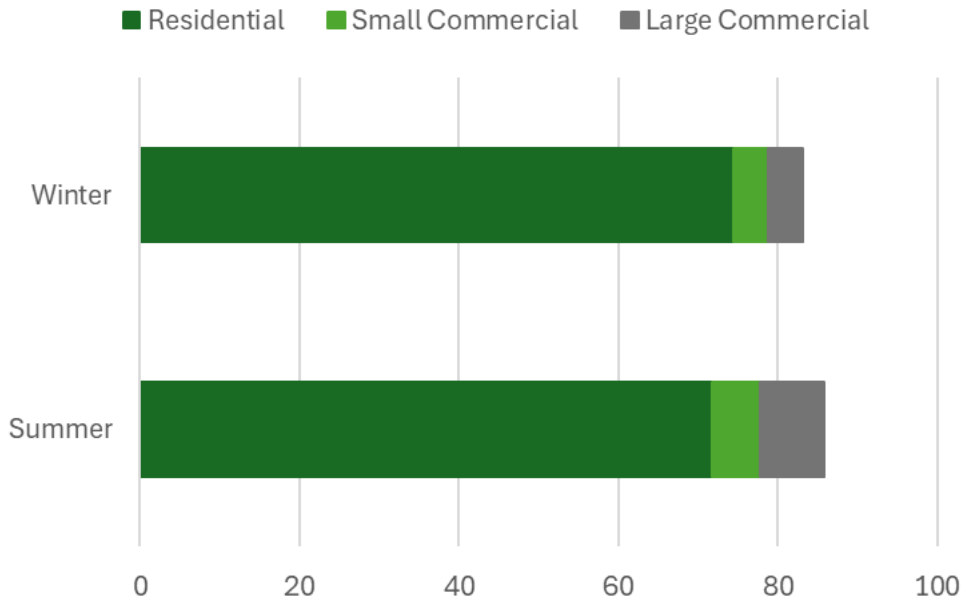
Measures are analyzed based on scenario parameters

Low Scenario	Medium Scenario	High Scenario
• "Business as usual" • Aligned with existing programs • Residential and SMB DLC, Thermostats	• Include all economic loads/ measures • Target cost-effective customer segments • Assume medium incentives, marketing & outreach	• Include all economic loads/measures • Target all customer segments that maintain program cost-effectiveness • Enhanced incentives, marketing & outreach

DR Achievable Potential by Sector

- **Medium scenario:** includes Smart Thermostat (BYOT), Critical Peak Pricing, Pool Pump (Switch), Water Heat (Grid-Enabled), and Behavioral DR

Sector	Season	Achievable Potential (MW)		
		Short-Term (2030)	Medium-Term (2035)	Long-Term (2045)
Residential	Summer	26.1	47.1	71.7
	Winter	27.1	48.9	74.4
Small Commercial	Summer	2.2	4.0	6.1
	Winter	1.6	2.9	4.4
Large Commercial	Summer	2.9	5.2	8.0
	Winter	1.6	2.9	4.4

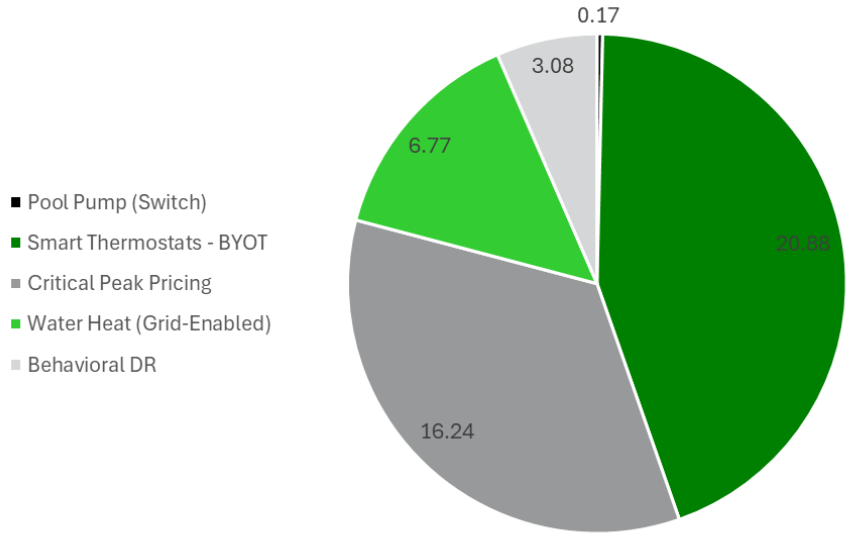


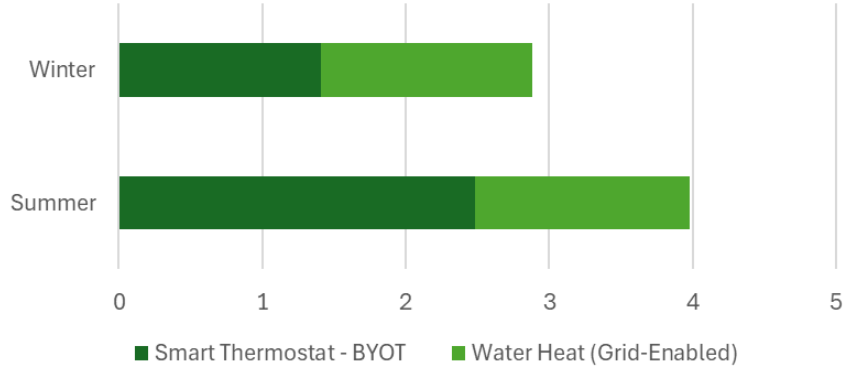
DR Achievable Potential by Measure

Residential		Short-Term (2030)	Medium-Term (2035)	Long-Term (2045)
Smart Thermostat - BYOT	Summer	11.550	20.879	31.757
	Winter	12.920	23.356	35.525
Critical Peak Pricing	Summer	8.985	16.243	24.706
	Winter	7.029	12.708	19.329
Water Heat (Grid-Enabled)	Summer	3.747	6.774	10.303
	Winter	4.782	8.644	13.148
Pool Pump (Switch)	Summer	0.096	0.173	0.264
	Winter	0.423	0.765	1.164
Behavioral DR	Summer	1.703	3.078	4.683
	Winter	1.903	3.441	5.234

Small Commercial		Short-Term (2030)	Medium-Term (2035)	Long-Term (2045)
Smart Thermostat - BYOT	Summer	1.37	2.48	3.77
	Winter	0.77	1.41	2.14
Water Heat (Grid-Enabled)	Summer	0.83	1.50	2.28
	Winter	0.81	1.47	2.24

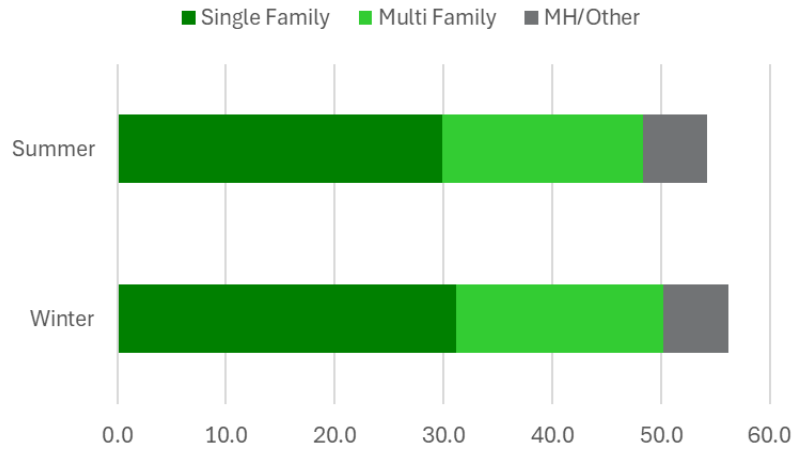
Mid-Term Summer Potential by Measure, Medium Scenario



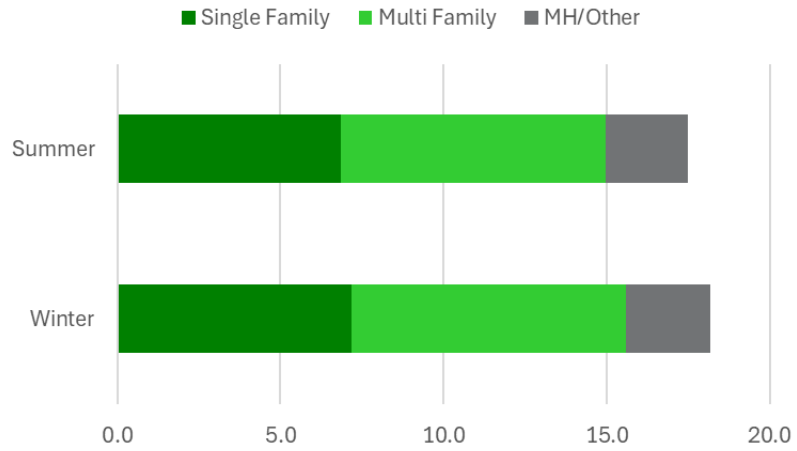


DR Achievable Potential by Segment

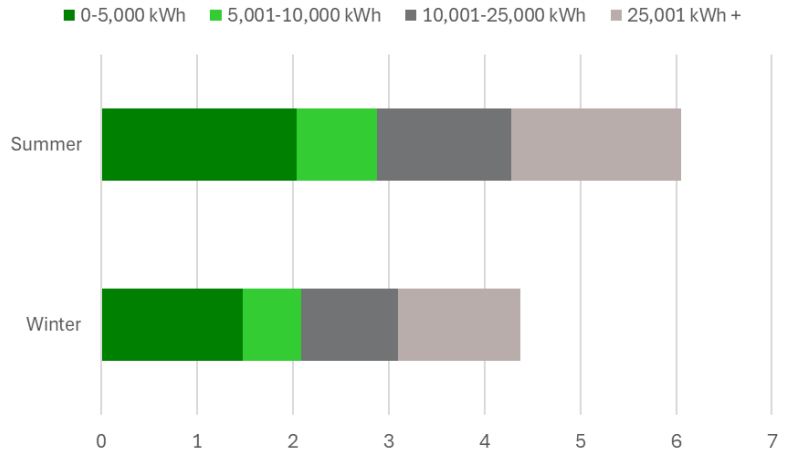
Residential – Full Year



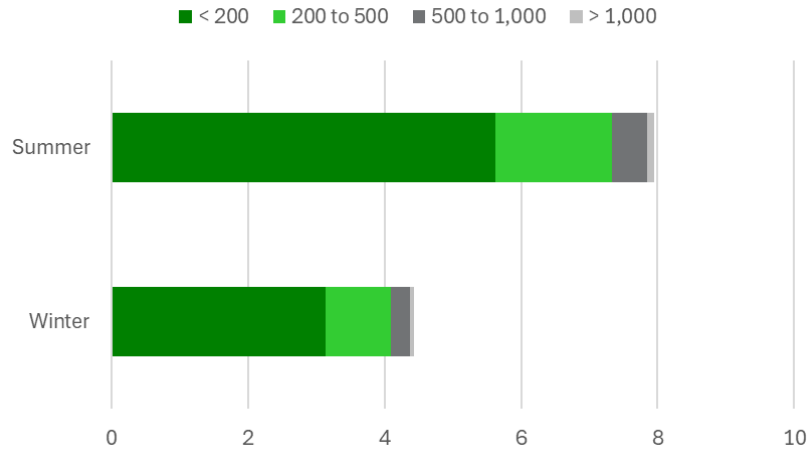
Residential – Seasonal



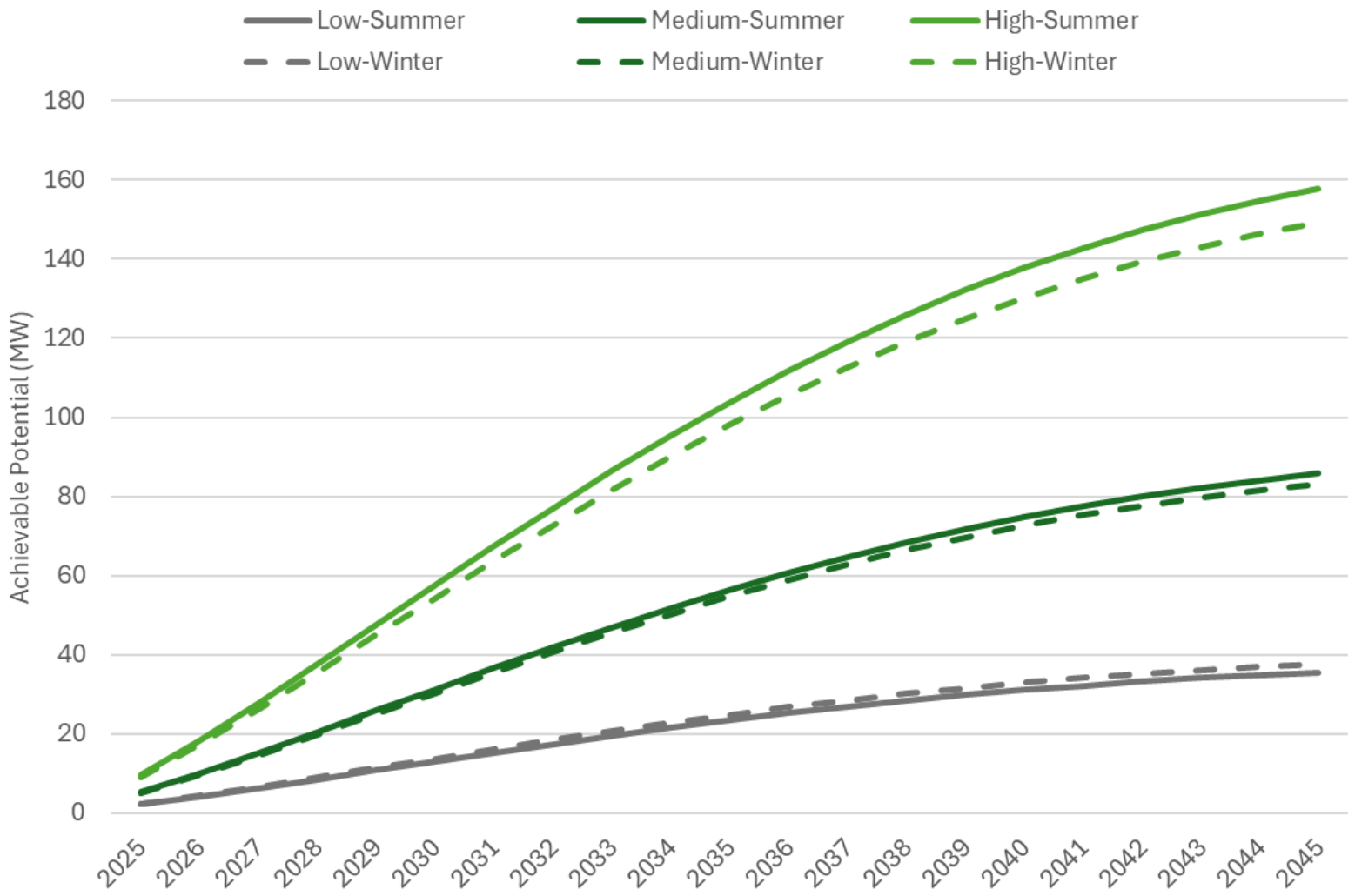
Small Commercial



Large Commercial



DR Sensitivity Case



Questions?

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AP Scenarios – Year 10 Snapshot

santee cooper®

Summary of 10-Year Cumulative AP Results by Scenario *(w. Roll-Off)*

	Residential	Commercial	New Technology EVs	System
2026 Base Load (MWh)	2,171,150	1,962,867	32,174	4,166,191
Low Scenario AP (MWh), *% of first-year base load*	69,868 *3%*	181,094 *9%*	0.15 *0%*	250,962 *6%*
Med Scenario AP (MWh), *% of first-year base load*	85,729 *4%*	218,252 *11%*	14 *0%*	303,996 *7%*
High Scenario AP (MWh), *% of first-year base load*	164,789 *8%*	303,129 *15%*	14 *0%*	467,933 *11%*

Summary of 20-Year Cumulative AP Results by Scenario *(w. Roll-Off)*

	Residential	Commercial	New Technology EVs	System
2026 Base Load (MWh)	2,171,150	1,962,867	32,174	4,166,191
Low Scenario AP (MWh), *% of first-year base load*	69,793 *3%*	135,595 *7%*	0.38 *0%*	205,389 *5%*
Med Scenario AP (MWh), *% of first-year base load*	86,126 *4%*	172,182 *9%*	36 *0.1%*	258,345 *7%*
High Scenario AP (MWh), *% of first-year base load*	177,701 *8%*	258,997 *13%*	36 *0.1%*	436,734 *10%*

Achievable Potential Scenarios

Sum of Annual Savings Over 20 Years by Scenario *(w/o. Roll-Off)*

	Residential	Commercial	New Technology EVs	System
2026 Base Load (MWh)	2,171,150	1,962,867	32,174	4,166,191
Low Scenario (MWh), *% of first-year base load*	152,517 *7%*	337,035 *17%*	0.52 *0%*	489,552 *12%*
Med Scenario (MWh), *% of first-year base load*	185,650 *9%*	405,505 *21%*	50 *0.2%*	591,205 *14%*
High Scenario (MWh), *% of first-year base load*	327,635 *15%*	556,262 *28%*	51 *0.2%*	883,947 *21%*

Res AP by End Use – Year 10