



Quarterly Technology Area Report (Q4 2024)



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Portfolio Information

A summary of the number of project submissions the program has received between October and December 2024 (Q4), and what project stage and technology area each submission represents can be found in Table 1 below. Also illustrated are the program cumulative totals in each category since the program began in May 2022. Please see the program [Technology Priority Maps](#) (TPMs) to learn more about the technology areas. The latest HVAC, Water Heating, and Whole Buildings TPMs were published on September 1, 2024, with the Lighting, Plug Loads and Appliances and Process Loads TPMs published on December 9th and the Portfolio Enhancements TPM published on December 27th. The Lighting TPM has been sunset with its high priority technology subcategories moved to the renamed Lighting, Plug Loads and Appliances TPM. Other subcategories were moved to Process Loads and Whole buildings as appropriate. A new TPM has been added, named Portfolio Enhancements TPM. During Q4, the team received 67 new project submissions.

Table 1: Project Submission Status Summary by Technology Area

Technology Areas	Q4 vs Cumulative (C)	Number of Projects at Project Stage					Projects Deferred*	Project Submissions
		Completed	Reporting	Implementation	Project Planning	Scanning & Screening		
Whole Building	Q4	7	1	0	7	1	1	11
	C	16	2	10	7	1	6	78
HVAC	Q4	7	1	0	7	9	1	24
	C	18	3	22	7	10	8	105
Water Heating	Q4	4	0	1	4	0	5	9
	C	11	5	8	5	0	8	51
Process Loads	Q4	9	0	2	5	0	7	17
	C	15	1	11	6	2	16	87
Lighting, Plug Loads and Appliances	Q4	2	0	0	2	0	2	6
	C	3	1	4	2	1	4	27
Lighting	Q4	0	0	0	0	0	0	0
	C	0	0	2	0	0	3	7
Portfolio Enhancement	Q4	0	0	0	0	0	0	0
	C	0	0	0	0	0	0	0
Total	Q4	29	2	3	25	10	19	67
	C	63	12	57	27	14	45	355

*The “deferred” project classification means these projects will not move forward at this time but will be revisited intermittently to reassess if they meet future program needs and priorities.

Figure 1 gives a breakdown of where this quarter's project submissions came from, classified by submitter type.

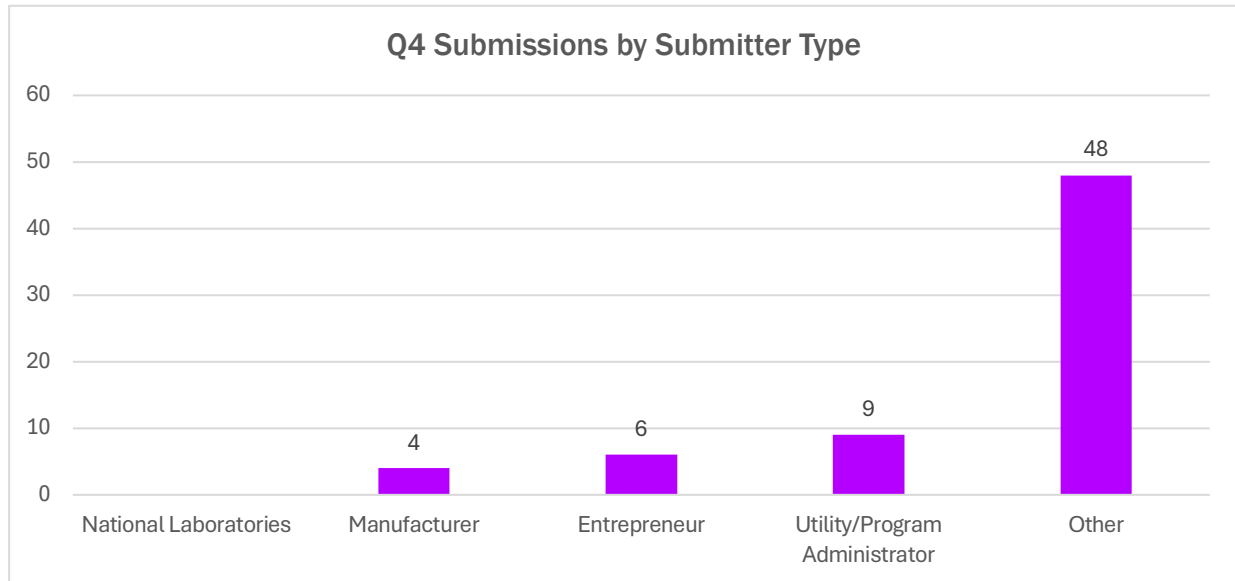


Figure 1: Program participant type

A summary of the number of projects that were selected to move forward, organized by TPM technology area, can be found in

Table 2. Included in this table are the count of projects for this quarter, broken out between technology development research (TDR) and technology support research (TSR) projects.¹

Table 2: Submissions Selected in Q4 by Project Type

Technology Area	Count of Projects by Project Type	
	TDR	TSR
Whole Building	3	4
HVAC	0	7
Water Heating	3	1
Process Loads	0	5
Lighting, Plug Loads & Appliances	0	2
Total	6	19

¹ Project type definitions can be found [here](#).

Figure 2 displays a pipeline of projects that CalNEXT expects to be completed in each year of the program based on projects that have been selected for the program portfolio. This figure includes any projects that have been completed. As the figure shows, the program has completed 28 TSRs and 6 TDRs in in 2024, missing the goal by 2 TDRs and 4 TSRs. The program also needs just 1 additional TDR with a 2025 completion dates to meet 2025’s targets. Looking ahead to 2026, the program has exceeded the goal of 5 TDRs while still falling slightly short of the goal of 26 TSRs. All final project reports from 2024 and before can be accessed [here](#).

Figure 2: Selected project expected completion year (target number reflected as line)

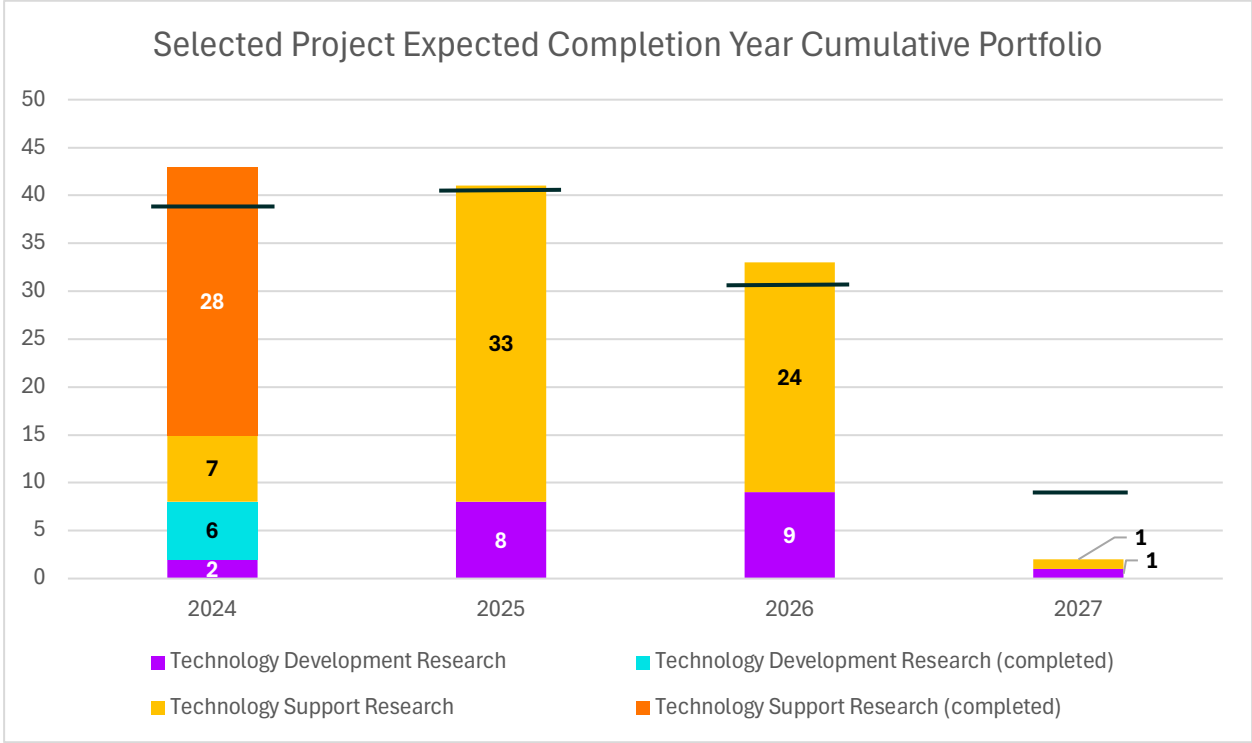


Table 3 illustrates the results of the 2024 committed project goals.

Table 3: Results of 2024 Committed Research Project Portfolio

Research Type	2024 Target	Planned	Actualized	Awaiting Approval*	Percent Actualized
TDR	8	8	8	0	100%
TSR	32	32	32	0	100%
Focused Pilot	3	3	3	0	100%

Research Type	2024 Target	Planned	Actualized	Awaiting Approval*	Percent Actualized
Total	43	43	43	0	100%

*Projects are selected from both program partner and public submission.

Technology Area Information

Table 4 characterizes attributes associated with each of the selected projects from Q4. Attributes include TPM technology area and subcategory, and if the project is expected to have energy efficiency (EE) benefits, disadvantaged communities (DAC) and/or hard-to-reach (HTR) customer benefits, decarbonization (decarb) benefits, and/or load shifting.

Table 4: Q4 Selected Projects by TPM Subcategory and Attributes

TPM	Submission Name	TPM Subcategory	EE Benefit	DAC/HTR Benefit	Decarb Benefit	Load Shifting
Water Heating	California Multifamily Split HPWH Market Study	Unitary Electric Water Heaters	X	X	-	-
	Field Demonstration of Atmospheric Storage Central Heat Pump Water Heater	Commercial Domestic Hot Water System Design	X	X	-	X
	Multifamily CHPWH Fault Detection Diagnostics (FDD) and Load Shift Controls	Commercial Domestic Hot Water System Design	X	X	-	X
	Return-to-primary Central HPWH System Field Demonstration	Commercial DHW System Design	X	X	-	-
Heating Ventilation Air Conditioning (HVAC)	Easy-Install DR heat pump	Micro Heat Pumps	X	X	-	X
	EE BE project success tools	Residential Air-to-Air Heat Pumps	X	X	-	-
	Heat Pump Based Energy Recovery Ventilator	Commercial Air-to-Air Heat Pumps	X	-	-	X
	Laboratory Testing of VCHPs to Develop BEM Performance Maps	Residential Air-to-Air Heat Pumps and Controls	X	-	-	-
	PCM Enhanced Ceilings	Commercial scalable thermal storage	X	X	-	-

TPM	Submission Name	TPM Subcategory	EE Benefit	DAC/HTR Benefit	Decarb Benefit	Load Shifting
	Performance metrics of Micro Heat Pumps Through Laboratory Testing	Micro Heat Pumps	X	X	-	-
	Simplified HVAC Control Retrofits	Commercial Installation, Operation & Maintenance	X	-	-	-
Whole Building	Electrification with Power Efficient Appliances	Integrated Systems	X	-	X	-
	Embodied Carbon One-for-One Material Substitution Market Characterization	Design & Construction	X	-	-	-
	Field Demonstration of Mobile Home Electrification	Design and Construction	X	X	-	-
	Residential multi-function heat pump market study	Integrated Systems	X	-	X	-
	SmartAg Controls: Incentivizing Efficiency & Yields	Horticultural Lighting	X	X	X	X
	VIG-Electrochromic Technology Integration Lab Demo	Integrated Systems	X	-	-	-
	Wastewater Energy Transfer (WET) Heat Recovery Systems Field Evaluation	Integrated Systems	X	X	-	-
Lighting, Plug Loads and Appliances	Market and Technical Evaluation of Combination Washer-Dryer Units for Multifamily Buildings	Decarbonizing Household Appliances	X	X	X	-

TPM	Submission Name	TPM Subcategory	EE Benefit	DAC/HTR Benefit	Decarb Benefit	Load Shifting
	V2X Round-Trip Efficiencies Market Study	Electric Vehicle Supply Equipment (EVSE)	X	-	X	X
Process Loads	Agricultural Sector Adoption of PEI Pumps Market Study	Pumping Systems	X	X	-	-
	Comparative Field Assessment of CO ₂ System Performance vs. HFC Refrigeration in Supermarkets	Refrigeration-Commercial	X	-	X	-
	Datacenter Liquid Cooling Lab Evaluation	Data Centers & Enterprise Computing	X	-	X	-
	Electrification of Greenhouse Heating Systems	Controlled Environment Horticulture (CEH)	X	-	X	-
	Packaged Propane Refrigeration Market Analysis	C&I refrigeration	X	-	X	-

Table 5: Projects Benefiting DAC and HTR Customers

Project Type	Project Name
TDR	<ul style="list-style-type: none"> • Advanced Multifamily EV Load Management System • Aerosol Sealing of Existing Attics and Crawlspace • California Multifamily Split HPWH Market Study • Field Demonstration of Atmospheric Storage Central Heat Pump Water Heater • Hybrid RTU • Market Potential for Heat Pump Assisted Hot Water Systems in Food Service Facilities • Mobile and Manufactured Housing Market Characterization Study • Multifamily CHPWH Fault Detection Diagnostics (FDD) and Load Shift Controls • Residential Multi-Function Heat Pump: Laboratory Testing - UC Davis WCEC • Residential Multi-Function Heat Pumps: Heat Exchanger Improvement - UC Davis • Residential Multi-Function Heat Pumps: Project Search* • Solar Assisted HVAC Market Study
TSR	<ul style="list-style-type: none"> • 120V Induction Stoves with Battery Back-Up • All-Electric Commercial Kitchen Electrical Requirements Study • Agricultural Sector Adoption of PEI Pumps Market Study • Central Heat Pump Water Heating Control Optimization • Comfort Impacts of Partial Coverage ASHPs • Commercial and MF CO2 based Heat Pump Water Heater Field Demonstration • Commercial Kitchen Hot Water System Design Guide • Compressed Air End-Use Air Management System • Cooling and Dehumidification for Indoor Farming • Double Duct Packaged Terminal Heat Pump Field Demonstration • Easy-Install DR heat pump • EE BE project success tools • Electric Infrastructure Upgrades Alternatives Study for Manufactured Housing • Emergency Replacement Heat Pump Water Heater Market Study

Project Type

Project Name

- Enhanced Normalized Metered Energy Consumption Analysis with Rapid Interventions
- Field demonstration of electric clothes dryer controller
- Field Demonstration of Mobile Home Electrification
- Harvesting Mid-size Industrial BRO Savings
- HVAC Capacity Controller
- HVAC Thermal Energy Storage System (TESS)
- Increasing Heat Pump Water Heater Deployment
- Integrated HVAC RTU Remote Monitoring Systems
- Lab Research of Electric Conveyor Ovens
- Low-Income Multifamily Housing Characteristics Study
- Market and Technical Evaluation of Combination Washer-Dryer Units for Multifamily Buildings
- Market Study of Household Electric Infrastructure Upgrade Alternatives for Electrification
- Master Mixing Valve Field Study
- Multifamily Domestic Hot Water Recirculation Survey
- Multifamily In-Unit Heat Pumps
- New CFS Measure Prioritization
- Overcoming Key Barriers to Electrification of Foodservice Hot Water in California
- Packaged Central CO2 Heat Pump Water Heater Multifamily Demonstration
- PCM Enhanced Ceilings
- Performance metrics of Micro Heat Pumps Through Laboratory Testing
- ProGreen R744 Chiller System
- Refrigeration Capacity Load Matching
- Residential Housing Characteristics Study
- Restaurant Field Monitoring
- Return-to-primary Central HPWH System Field Demonstration
- SmartAg Controls: Incentivizing Efficiency & Yields
- Smart Controls for Data-Driven Indoor Agriculture Field Evaluation
- Variable Refrigerant Flow (VRF) Refrigerant Management Market Assessment
- Wastewater Energy Transfer (WET) Heat Recovery Systems Field Evaluation
- Wastewater Treatment SB1383 Compliance Characterization

Table 5 above includes the projects from the program lifetime, broken down between TDR and TSR, that have been identified as benefiting DAC and HTR customers.

The goal of publishing this report is to provide transparency into the CalNEXT portfolio and summarize the program's key focus areas. Future quarterly reports will be updated to show the progress being made from quarter to quarter. Updates to TPMs or the program priorities and future requests for information will be published on the [CalNEXT website](#).