Case Study: Cape Light Compact's Cape and Vineyard Electrification Offering

April 8, 2025

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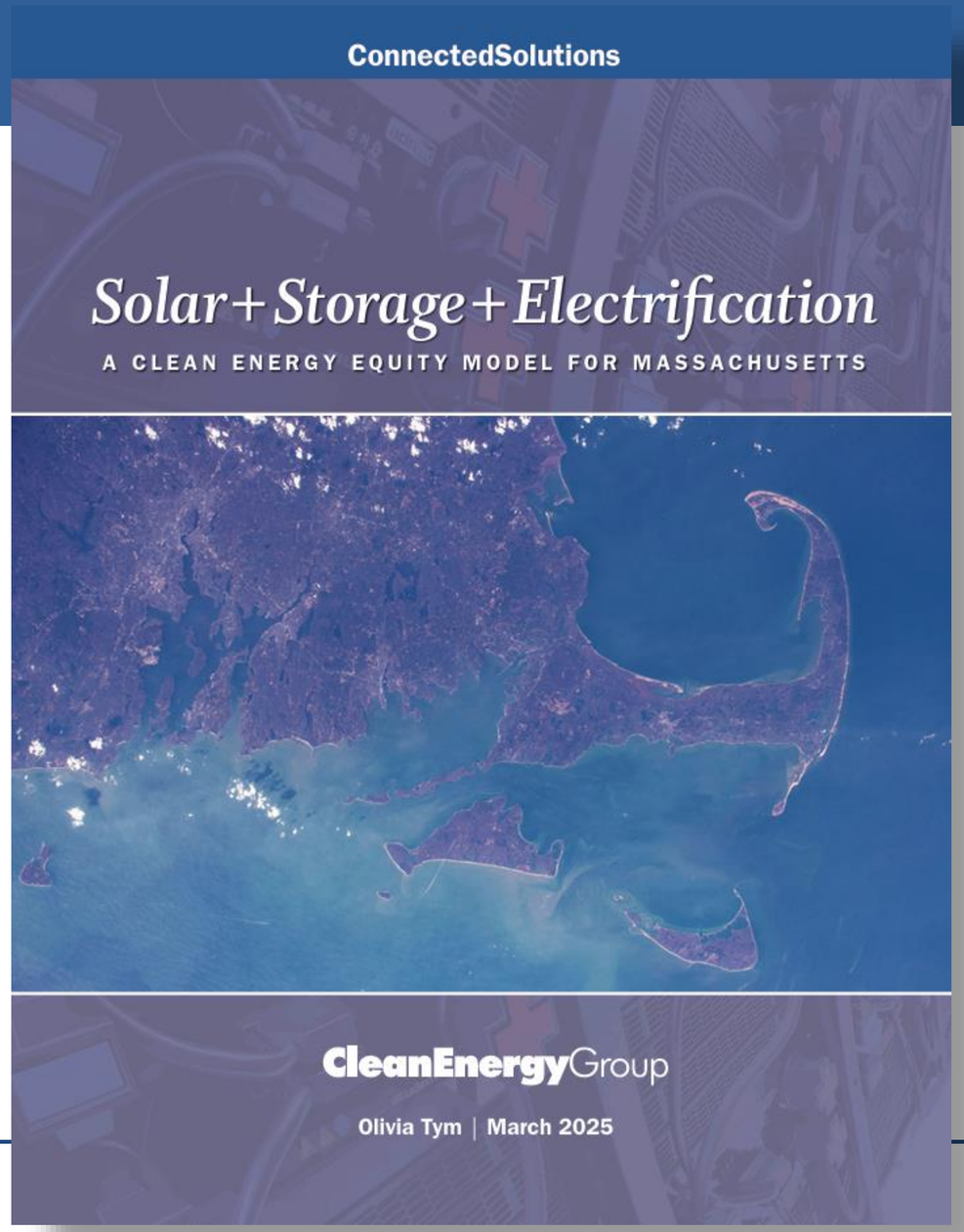
MARCH 2025

Solar+Storage+Electrification: A Clean Energy Equity Model For Massachusetts

Olivia Tym, CEG

Available at: https://www.cleanegroup.org/publication/solar-storage-electrification-cveo-massachusetts/



Webinar Speakers

Case Study: Cape Light Compact's Cape and Vineyard Electrification Offering

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Thank You

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Upcoming Webinars

Energy Resilience for Medically Vulnerable Multifamily Affordable Housing Residents: A Technoeconomic Analysis for Connecticut (4/10)

Load Growth and Electric System Reliability (4/22)

A Climate Resilient Energy Code for Multifamily Affordable Housing (4/29)

Solar+Storage Financing Options for Nonprofits

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Cape Light Compact

Program Overview:
Cape and Vineyard Electrification Offering

Stephen McCloskey & Miranda Skinner

April 8th, 2025

Who is the Cape Light Compact?

The **Cape Light Compact** is a municipal energy services organization operated by the 21 towns on Cape Cod and Martha's Vineyard formed in 1997

Mission: To serve our Cape Cod and Martha's Vineyard 205,000 customers through the delivery of proven energy efficiency programs, effective consumer advocacy, and a renewable competitive electric supply

Energy Efficiency Policy Goals

Cape Light Compact

Decarbonization

Equity

Customer experience

What is the Cape and Vineyard Electrification Offering (CVEO)?

CVEO is a strategic electrification and energy optimization turnkey offering that combines home weatherization with the following technologies:

- Cold Climate Heat Pumps
- Solar PV
- Battery Storage (if applicable)
- Heat Pump Hot Water Heaters (if applicable)
- Electric Stoves (if applicable)

Goal: To fully decarbonize 100 properties on Cape Cod and Martha's Vineyard for low and moderate-income residents who heat with oil, propane, electric resistance, or had a heat pump previously installed during the 22-24 Three-Year Plan.

Status: CVEO was approved by the Massachusetts Department of Public Utilities in January of 2023. The final installation for a program participant will be in April 2025.

Why was the Cape and Vineyard Electrification Offering Proposed?

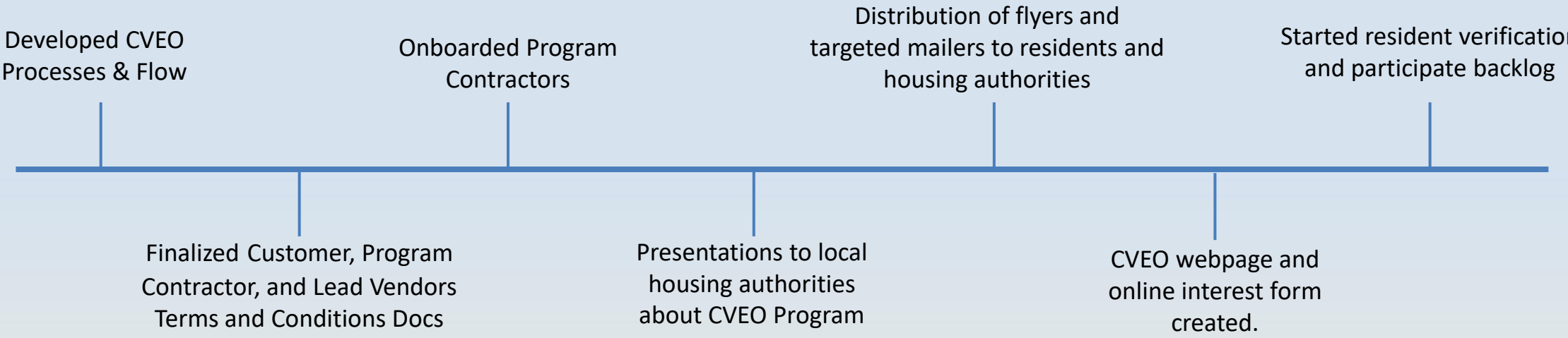
- Massachusetts Green Communities Act (2008)
  - Updated in 2018 via the Act to Advance Clean Energy
    - Expanded the permissible scope of energy efficiency plans to include strategic electrification, energy storage, and other active demand management technologies that result in customers switching to renewable energy sources or other clean energy technologies.
- Snapshot of Cape Cod and Martha's Vineyard Solar Installations (2016-2018)
  - Only 8% of Cape Cod or Martha's Vineyard solar installs were in low-income census block groups
  - Only 2% of installations were for homes where residents earned 80% or less that state median income
- Cape Light Compact saw this as opportunity to serve this income demographic through the creation of the Cape and Vineyard Electrification Offering (CVEO)

CVEO Program Overview Outline

	Income Level (SMI)		Customers			HP Incentive	Solar PV Incentive	Storage Incentive
			2023	2024	Total			
Deed Restricted	Low-Income	below 60%	15	35	50	100% (Statewide)	100%	100%
	Affordable	61-80%	9	21	30	100%	100%	100%
Non-Deed Restricted	Moderate- Income	61-80%	6	14	20	80% (max customer copay of $5,000, financed w/ Heat Loan)	$15,000 incentive. Finance balance w/ Heat Loan	Finance w/ Heat Loan
	Total Participants		30	70	**100**			

Getting CVEO 3.0 Up and Running

Jan-June 2023 Timeline



CVEO Implemented through Lead Vendor Model

- Conduct initial site assessment to determine feasibility
- Acts as point of contact for residents participating in CVEO
- Coordinates with heat pump and solar/battery subcontractors to scope the job and reviews technical and cost elements of program technologies.
- Submits project proposal to Cape Light Compact for approval
- Coordinates installation schedule on behalf of program participant and among contractors
- Collect all relevant data and information needed for reporting and evaluation

CVEO Flow

Participant Intake

Initial Site Assessment

Conceptual Solar Assessment

LV Heat Load Calculation and Design

Heat Pump Contractor Site Visit

Weatherization (If Applicable)

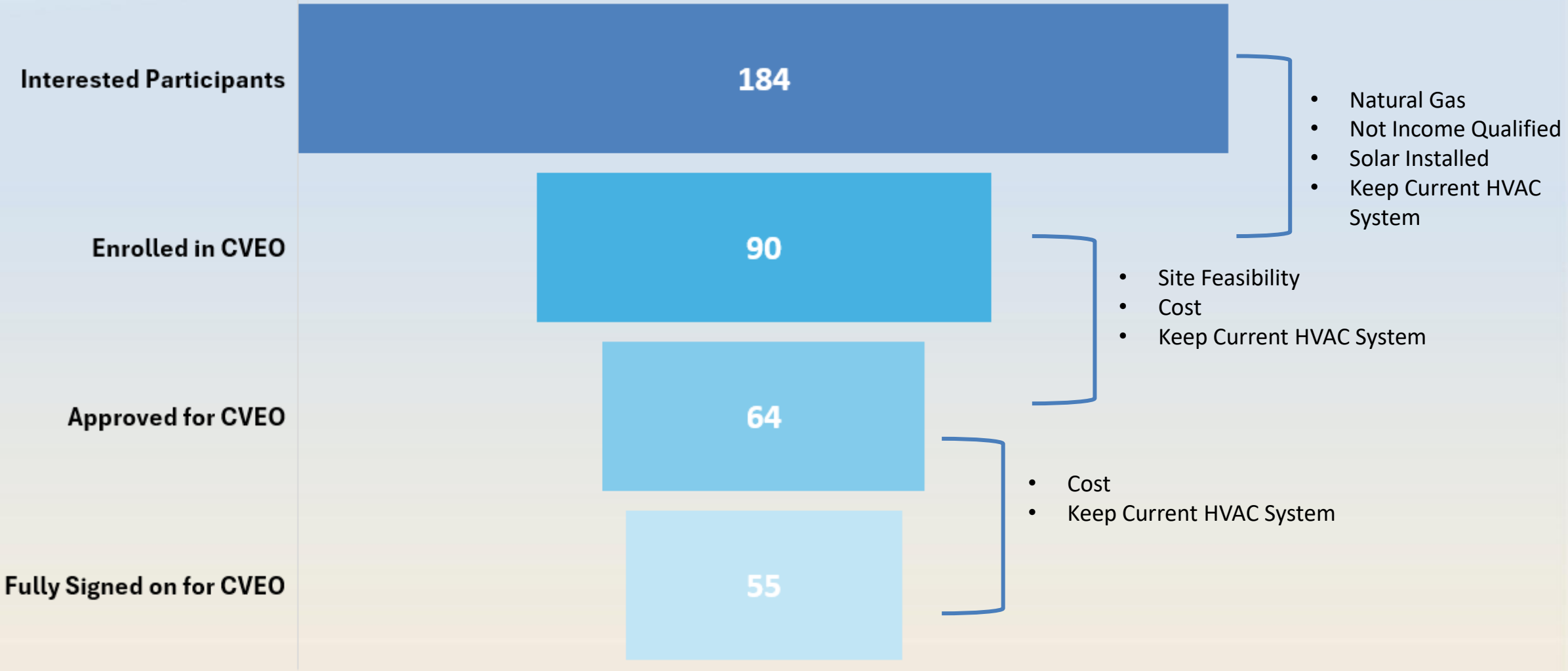
Electric Panel Upgrade

Solar Contractor Site Visit

Heat Pump Install

Solar PV/Battery Install

Customer Outreach & Engagement Funnel



CVEO Participant Overview

Income Category	Total Participants	Cape Cod	Martha's Vineyard	Owner	Renter
Income Eligible	39	29	10	25	14
Moderate/ Affordable	16	5	11	14	2
Total	55	34	21	39	16

CVEO Customer Insights

Customer Decision Making

Costs Considerations

- CVEO participants that were required to finance a portion of the CVEO Program Measures were less likely to move forward due to cost considerations.
  - 13 residents dropped from program after receiving their initial site assessment and learning what their copay for solar would be.

Timing of Prior HVAC Install + HVAC Removal Requirements

- To participate in CVEO, a participant was required to remove or fully displace the full removal or displace their current fossil fuel or electric baseboard heating system.
  - 7 residents at various points in the customer funnel expressed that they did not want to remove their current HVAC systems.
  - Some of these residents expressed that this was due to recently installing high-efficiency propane heating systems and/or on-demand hot water heating systems recently.

CVEO Program Insights

Program Considerations

Not all properties that enter the program are “CVEO ready”

- 34 participants in CVEO had at least one of the following barriers that needed to be cleared for participation:
  - Pre-weatherization barrier
  - Pre-electrification barrier
  - Solar barrier (Roof Replacement)

Program Timeline & Expectations

- Multiple touchpoints required by lead vendor and program contractors over an extended period (3-6 months)
  - On average a participant should expect 19-28 days of “on-site” activity for:
    - Site Assessment and Pre-Installation Walk Through
    - Installation of Program Technologies
    - Commissioning of Program Technologies
    - Inspections
- Project timeline is dependent on contractor availability

CVEO in Action

Cape Light Compact

CVEO in Action

CVEO in Action

Cape Light Compact

Background on the CVEO Evaluation

Cape Light Compact

Evaluation is being performed by a third-party contractor

Scoping of the evaluation started in August 2023

Budget of $300,000

Final report will be submitted to the MA DPU by August 1, 2025

Evaluation Structure

The evaluation is comprised of two parts

- Process evaluation
  - Program processes
  - Customer experiences
- Impact evaluation
  - Non-energy benefits
  - Bill impacts (bill analysis and telemetry data)

Research Questions – Program Processes

What was the intended program delivery process – what are the roles, who are the program actors, what are their interactions, over what time frame?

What actually happened? How was the program delivered?

What were the unanticipated challenges / barriers to program delivery?

How might these challenges / barriers be addressed?

What does the procurement of equipment and services and installation look like and are there any potential concerns with scalability of specific equipment or processes?

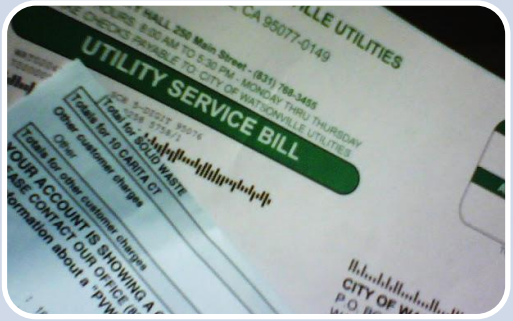
Research Questions – Participant Experience and Non-Energy Benefits

What were the primary motivations / barriers to participation?

What has been the experience with the installed technologies?

Research Questions – Telemetry and Billing Analysis

What is the change in energy consumption before and after participation in the offering?



How have participant energy bills been impacted?

How much excess solar PV generation is exported to the distribution system?

What is the savings for the package of installed measures?

Evaluation Status

As of now we have fielded the participant enrollment survey, program management interviews, and installer and appliance retailer interviews

We are currently fielding the participant experience survey and analyzing the data for the bill impacts and non-energy benefits

Evaluation Results – Participant Enrollment Survey

Majority of respondents had a positive experience in the enrollment process of CVEO

- High satisfaction with interactions with various players (CLC, RISE, installers)
- Only dissatisfaction expressed by some was the length of the process
- Additional information respondents would have liked to receive before the program include a defined timetable of the process and more explicit information on requirement to remove fossil fuel heating system

Solar panels and heat pumps were the most popular of the CVEO technologies

- Majority of respondents stated this was due to wanting to be more environmentally friendly and save on energy/ utility bills