

Cape & Vineyard Electrification Offering

Energy Efficiency Advisory Council

July 14, 2021



**Cape Light
Compact**

Working Together Toward A Smarter Energy Future

Cape & Vineyard Electrification Offering (CVEO)



- Cape Light Compact (CLC) is seeking passage of a resolution in support of CVEO from the EEAC
- CVEO advances the 2018 amendments to the Green Communities Act, and the revised proposal addresses concerns raised by stakeholders and the DPU
- Utilizing energy efficiency funds and leveraging outside funds, CVEO cost-effectively reduces participating customers' overall energy bills

CVEO Overview



- Deploys three technologies as a package:
 - Cold climate heat pumps
 - Solar photovoltaic (PV) systems
 - Battery energy storage systems (BESS)
- Focuses on low-income ($\leq 60\%$ SMI) and moderate-income (61-80% SMI) customer groups; limited to 250 customers
- All participants will be required to have energy assessment and install recommended measures prior to CVEO enrollment

Policy Background



- Designed with 2018 GCA Amendments in mind
 - Heat pumps: a plan may include “... strategic electrification, such as measures that are designed to result in cost-effective reductions in greenhouse gas emissions through the use of expanded electricity consumption while minimizing ratepayer costs.” G.L. 25, § 21, (b)(2)(iv)(A).
 - Batteries: a plan may include “...efficiency and load management programs including energy storage and other active demand management technologies.” G.L. 25, § 21, (b)(2)(iv)(A).
 - Solar PV: a plan may include “...programs that result in customers switching to renewable energy sources or other clean energy technologies.” G.L. 25, § 21, (b)(2)(iv)(J).
- Municipal Aggregators have unique authority

Background on Plan



- Compact initially proposed CVEO as part of 2019-2021 energy efficiency plan
 - 700 total customers, tiered services by income level
- DPU did not approve when initially proposed but stated it “merits close consideration.” Requested additional consideration of stakeholder concerns and required EEAC approval of redesign prior to resubmittal to DPU.
 - CLC has worked with stakeholders to develop a revised proposal

CVEO Objectives



- Serve **250** total non-gas heated participants, tiered services by income: Low-income (up to 60%), moderate income (61-80%)
 - Enhanced incentives for all three measures
- Convert oil, propane, electric resistance heat to cold climate heat pumps
- Install PV systems to support electrification of heating system and reduce GHG emissions
- Install battery storage for demand response & resiliency
- Addresses the issue of upfront cost barrier

CVEO Participant Incentives



Income Level (SMI)		Customers			Heat Pumps	Solar PV + Storage
		2022	2023	Total		
Low-Income	<=60%	100	50	150	100% of cost covered (EE funds)	100% of cost covered (EE Funds and non-EE funds)
Moderate Income	61-80%	66	34	100	100% of cost covered (EE funds)	75+% of cost covered (EE funds and non-EE funds) \$5,000 customer contribution cap
Total Participants		166	84	<u>250</u>		

Changes from Original Proposal



- Reduced size
- Eliminated enhanced incentives for >80% SMI
- Better leverages existing incentives/programs
 - Innovative third-party ownership (TPO) model for solar PV + battery systems allows monetization of tax credits and other incentive programs to reduce impact of EES on ratepayers
 - Federal ITC, depreciation, SMART, ConnectedSolutions, Clean Peak Standard, APS
 - Compact issued a Request for Information to solar developers to inform new design, and worked closely with stakeholders
- Changes result in lower overall cost, reduced bill impacts

Focus on Equity



- Low- and moderate-income customers are being left behind in terms of:
 - Electrification
 - Difficult to switch customers from oil and propane due to high upfront cost of heat pumps
 - Solar
 - Generally cannot take advantage of tax credits, high upfront cost
 - Only 8% of CC/MV solar installations are in LI census block groups
 - 2% of CC/MV MassCEC solar loans were to homes where residents earned 80% or less of SMI.
 - Reduces impact to electric bill from converting to heat pumps
 - Battery storage
 - Low- and moderate-income customers cannot pay for storage; statewide pay-for-performance program is not adequate for storage adoption in this customer group
- LI customers tend to have high energy burdens (% of income spent on energy)

TPO Key Design Considerations



- **PPA:** Compact will issue RFP for a “pre-paid” TPO PV + BESS power purchase agreement (PPA) and select qualified bidder
- **TPO:** Tax-equity TPO will own system for up to 10 years. Will be responsible for system performance and maintenance during TPO ownership period.
 - Vendor and participants will sign Compact’s contract
- **Participant cost:**
 - LI participant will have \$0 PPA
 - MI participants may have a non-zero PPA: responsible for 25% of system up to \$5,000
- **After 10 years:** At end of TPO ownership period, systems revert to customer at no additional cost

Participants' Perspective



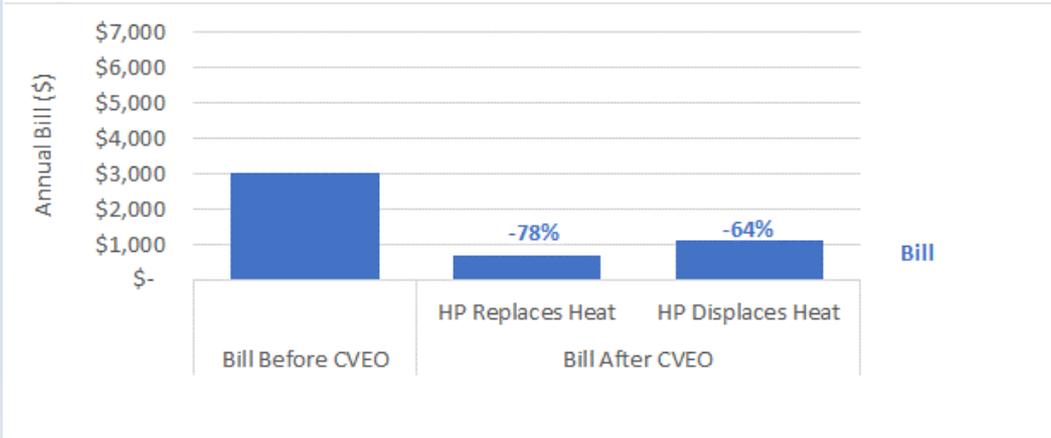
- Low-Income: All three technologies installed at no cost
- Moderate-Income:
 - HPs installed at no cost
 - PV+BESS payment for 25% of system cost, \$5,000 cap
 - Likely option to spread payment over term of PPA
- Both
 - Reduced energy bills
 - Customer owns HPs, TPO owns PV+BESS until end of PPA term
 - PV+BESS maintenance at \$0 cost over PPA term
 - CLC will issue RFP for extended maintenance beyond PPA at customer's option and expense
 - No HP maintenance cost for 5-10 years
 - CLC will procure 5-10 year maintenance contract for CVEO participants

Customer Energy Cost Impact

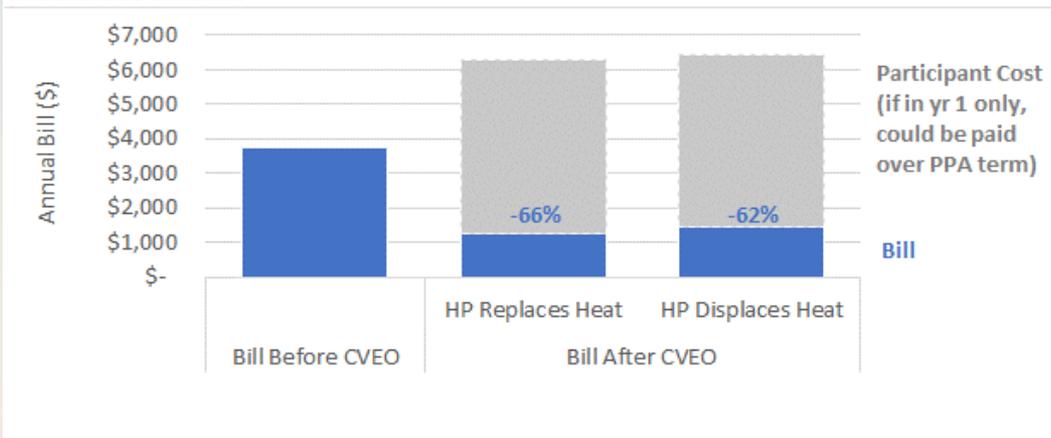


Customer Uses Oil Heat Before CVEO

Low Income



Moderate Income

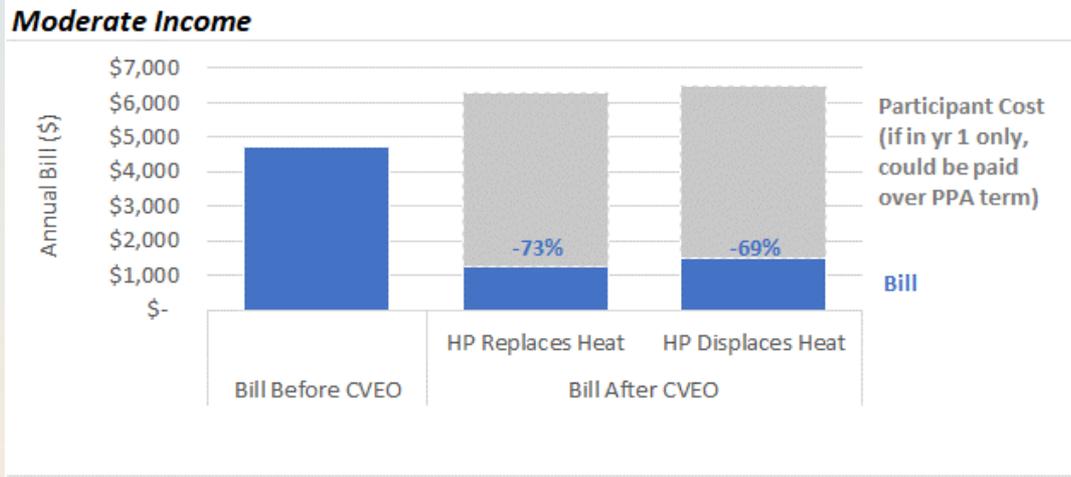
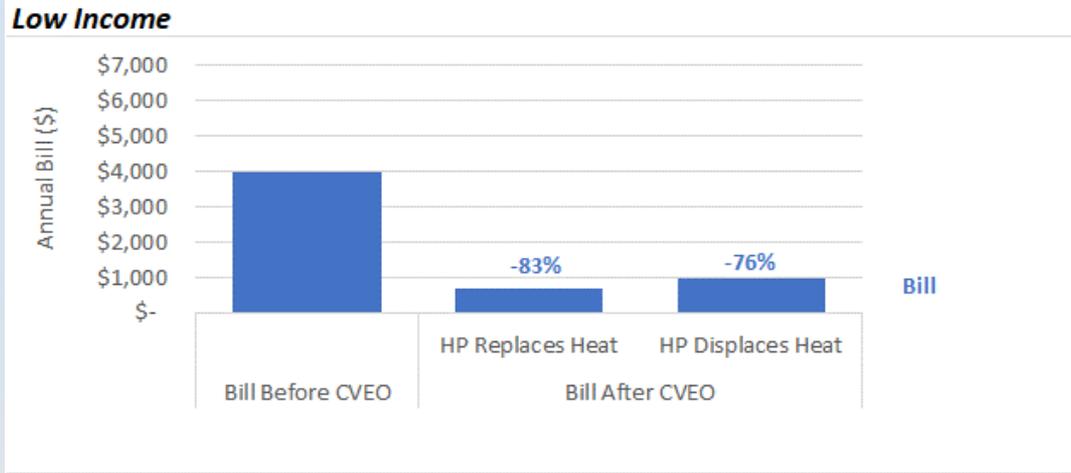


Package of measures is more beneficial to participant than installing any of the three alone

Customer Energy Cost Impact



Customer Uses Propane Heat Before CVEO



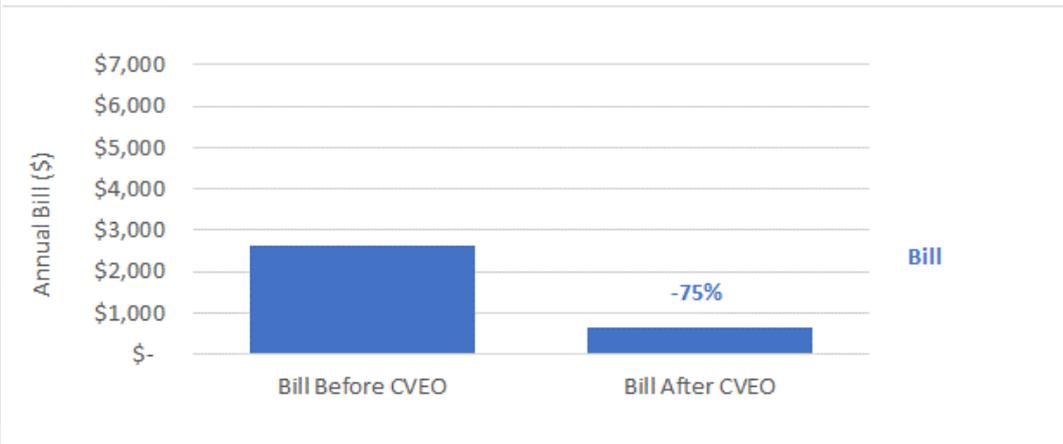
Package of measures is more beneficial to participant than installing any of the three alone

Customer Energy Cost Impact

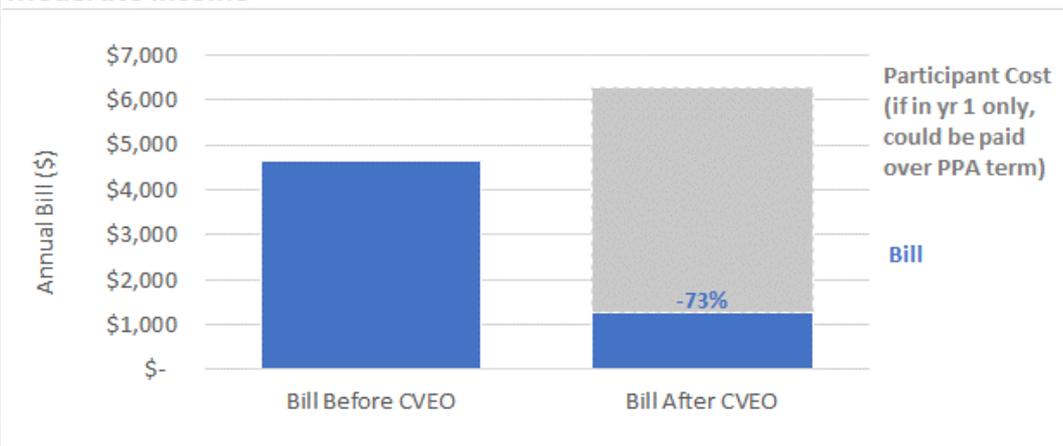


Customer Uses Electric Baseboard Heat Before CVEO

Low Income



Moderate Income



Package of measures is more beneficial to participant than installing any of the three alone

Revised Budget



	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Total</u>
Heat Pumps	\$3.4M	\$2.0M	\$0	\$5.4M
PV + Storage	\$3.7M	\$2.4M	\$0.5M	\$6.7M
Total	\$7.1M	\$4.4M	\$0.5M	\$12.0M

The Compact estimates CVEO will leverage over \$8M in non-energy efficiency funds.

In April 2020, the EEAC voted in support of a CVEO budget of \$10.4M for 2020-2021.

Bill Impacts



Residential (R-1)

Years	EERF		Energy Conservation		Avg. Monthly Usage (kWh)		Total Cost (per month)
2021	\$0.02579	+	\$0.00250	x	516	=	\$14.60
2022	\$0.03879	+		x		=	\$21.31
2023	\$0.03926	+		x		=	\$21.55
2024	\$0.04000	+		x		=	\$21.93
2022-2024	\$0.03935	+		x		=	\$21.59

Low Income (R-2)

Years	EERF		Energy Conservation		Avg. Monthly Usage (kWh)		Total Cost (per month)
2021	\$0.00148	+	\$0.00250	x	488	=	\$1.94
2022	\$0.00396	+		x		=	\$3.15
2023	\$0.00418	+		x		=	\$3.26
2024	\$0.00333	+		x		=	\$2.85
2022-2024	\$0.00382	+		x		=	\$3.09

Savings and Cost-Effectiveness



	2022	2023	2024	2022-2024
Savings				
Participants	166	84		250
Annual MWh	983	355	(39)	1,299
Lifetime MWh	28,108	12,138	(39)	40,207
Annual MMBTU	16,963	8,135	(354)	24,744
Lifetime MMBTU	351,891	174,683	(354)	526,221
Summer kW	1,786	2,315	2,150	6,251
Winter kW	(138)	(84)	-	(221)
Annual CO2 Metric Tons	897	467	(6)	1,358
Cost-Effectiveness				
Benefits (\$M)	20.2	10.9	0.7	31.8
TRC Costs (\$M)	7.7	4.4	0.5	12.6
Net Benefits (\$M)	12.5	6.5	0.2	19.2
Benefit-Cost Ratio	2.6	2.5	1.4	2.5
CLC Budget (\$M)	7.1	4.5	0.5	12.0

CVEO measures only. In 2024, CVEO customer continue participating in ConnectedSolutions.

Next Steps



- CLC awaits DPU order in DPU 20-40
- CLC requests Energy Efficiency Advisory Council's support for CVEO in its July Resolution on the April Draft of the 2022-2024 Energy Efficiency Plan
- CLC expects to include CVEO in its October Plan filing to the DPU