



# ***Annual Report for FY2021***

## ***of the Efficiency Maine Trust***

Energy, Utilities & Technology Committee

Maine State Legislature

1.13.2022

# FY2021 Highlights

- Supported projects that will avoid more than **\$315 million** wasted energy (lifetime)
- Leveraged more than **\$92 million** of incremental private investment
- Passed milestone of promoting more than **88,000** high-performance heat pump installations over the past 9 years
- Supported a record heat pump water heater (HPWH) installations in a single year – **10,783** units
- Supported weatherization projects in more than **1,800** homes
- Reduced new peak summer demand by more than **19.6 MW**
- Avoided estimated **71,666 short tons/year** of greenhouse gas (GHG) emissions

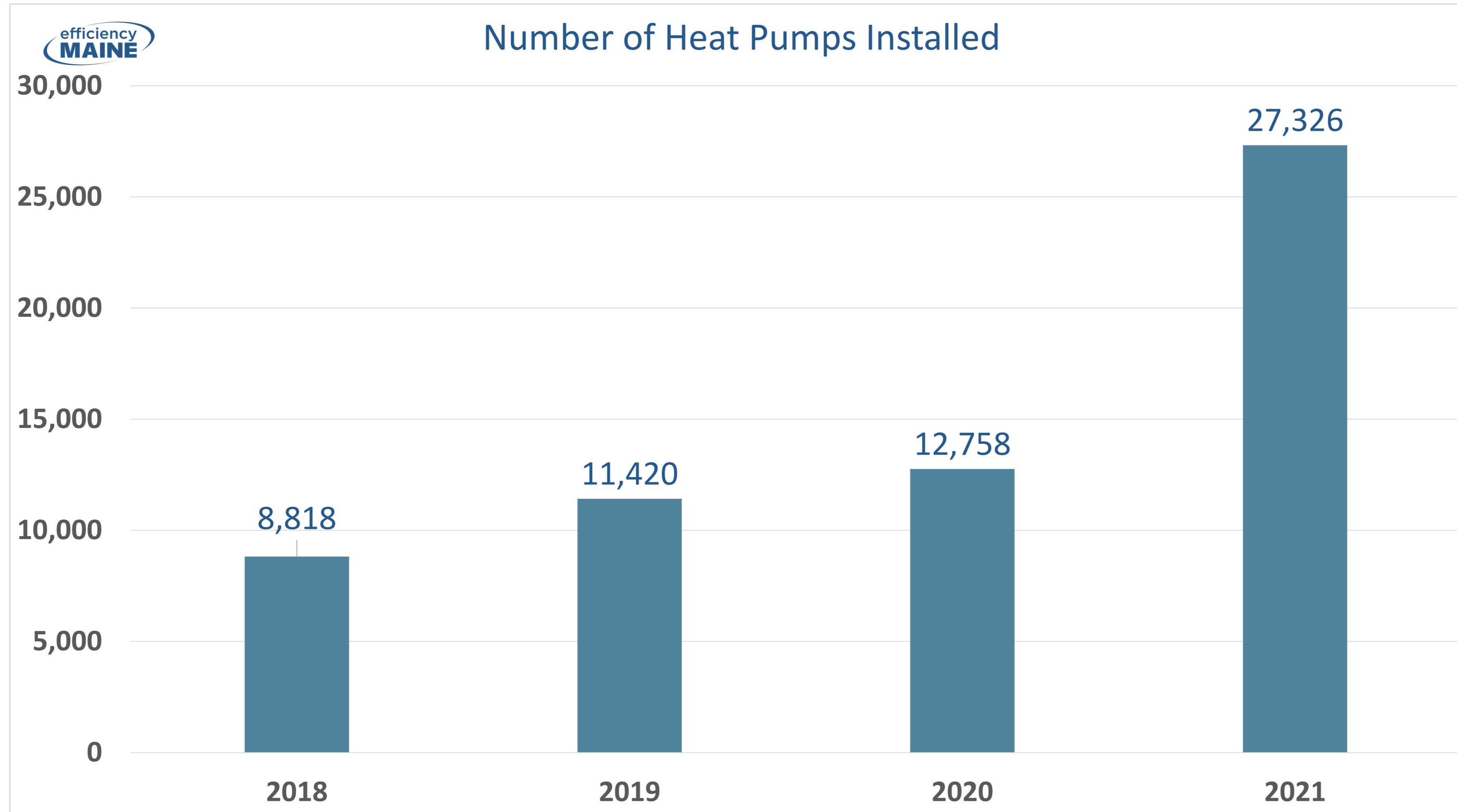
# Electric Program Expenditures

Program	Incentive	Delivery	Total
Commercial and Industrial Custom Program – Electric	\$1,677,345	\$530,258	\$2,207,603
Commercial and Industrial Prescriptive Program – Electric	\$8,184,158	\$1,079,654	\$9,263,812
Small Business Initiative - Electric	\$1,441,938	\$335,921	\$1,777,859
Distributor Initiatives – Electric	\$6,225,013	\$1,220,938	\$7,445,951
Retail Initiatives – Electric	\$6,090,886	\$1,253,437	\$7,344,323
Home Energy Savings Program – Electric	\$13,166,500	\$2,315,118	\$15,481,618
Low-Income Initiatives – Electric	\$2,558,910	\$710,446	\$3,269,356
Strategic Initiatives – Electric	\$0	\$1,753,703	\$1,753,703
Administration – Electric	\$0	\$1,987,837	\$1,987,837
<b>Total</b>	<b>\$39,344,750</b>	<b>\$11,187,311</b>	<b>\$50,532,061</b>

# Thermal Program Expenditures

Program	Incentive	Delivery	Total
Commercial and Industrial Custom Program – Natural Gas	\$240,239	\$52,182	\$292,421
Commercial and Industrial Custom Program – Unregulated Fuels	\$157,101	\$227,036	\$384,137
Commercial and Industrial Prescriptive Program – Natural Gas	\$166,774	\$13,202	\$179,975
Commercial and Industrial Prescriptive Program – Unregulated Fuels	\$394,017	\$49,114	\$443,131
Small Business Initiative – Unregulated Fuels	\$854,400	\$157,450	\$1,011,850
Distributor Initiatives – Natural Gas	\$114,761	\$10,238	\$124,999
Distributor Initiatives – Unregulated Fuels	\$738,400	\$158,299	\$896,699
Home Energy Savings Program – Unregulated Fuels	\$2,768,882	\$434,066	\$3,202,948
Low-Income Initiatives – Unregulated Fuels	\$2,774,318	\$581,141	\$3,355,459
Renewable Energy Demonstration Grants Program	\$0	\$0	\$0
Electric Vehicle Initiatives	\$2,525,679	\$176,008	\$2,701,687
Strategic Initiatives – Thermal	\$0	\$490,140	\$490,140
Administration – Thermal	\$0	\$1,372,153	\$1,372,153
<b>Total</b>	<b>\$10,734,571</b>	<b>\$3,721,029</b>	<b>\$14,455,600</b>

# Scaling Heat Pumps in Maine

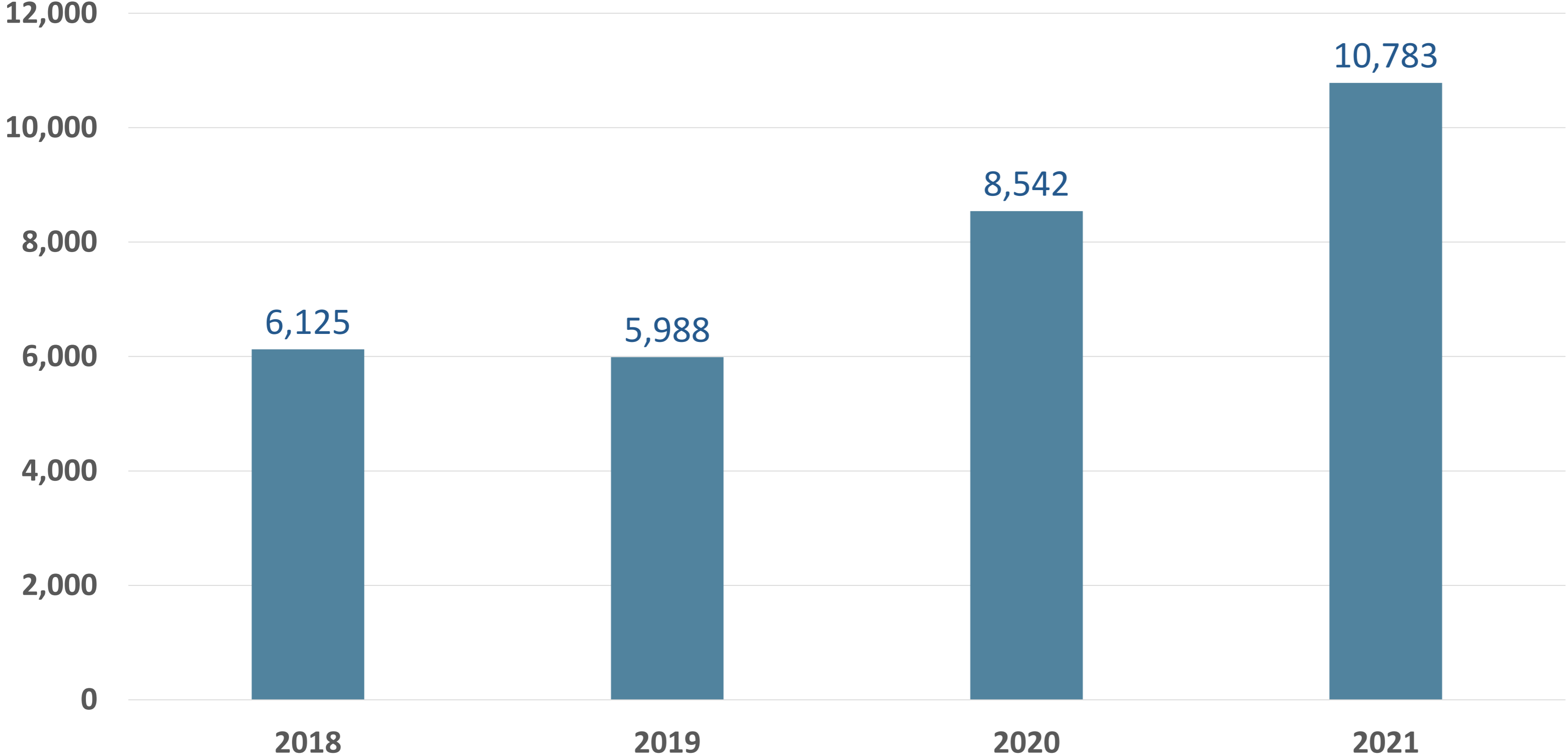


One (1) unit is equivalent to an efficient single-zone, mini-split heat pump that would typically displace 25.1 million BTUs (179 gal.) of heating oil per year. Larger heat pump systems are counted as more than one unit based on the heating BTU of the systems actually installed.

# Scaling Heat Pump Water Heaters in Maine

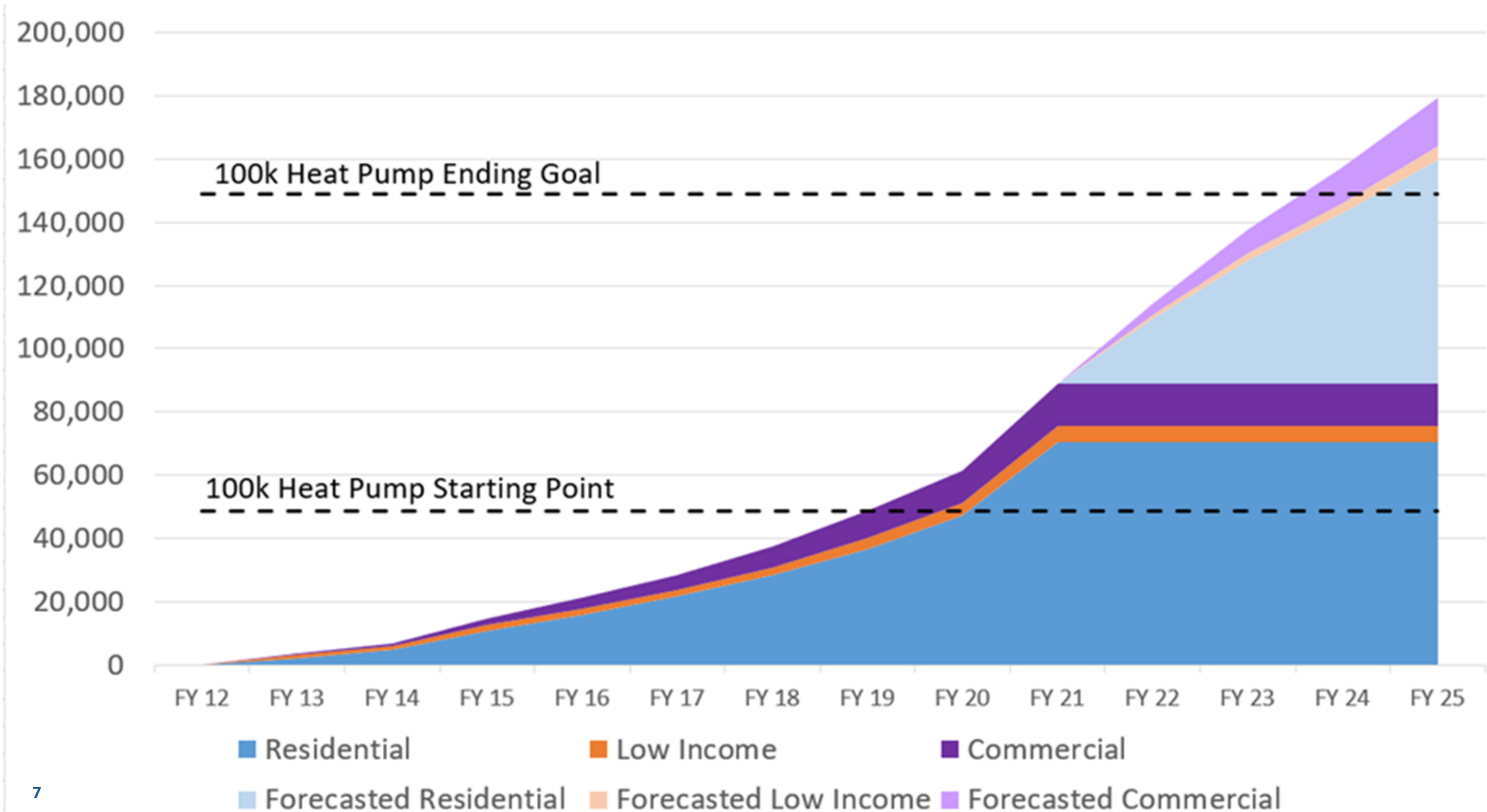


Total HPWH Annual Rebates



# Market Transformation for Heat Pumps in Maine

Actual through June 2021 & Forecast to June 2025



# C&I Custom Program

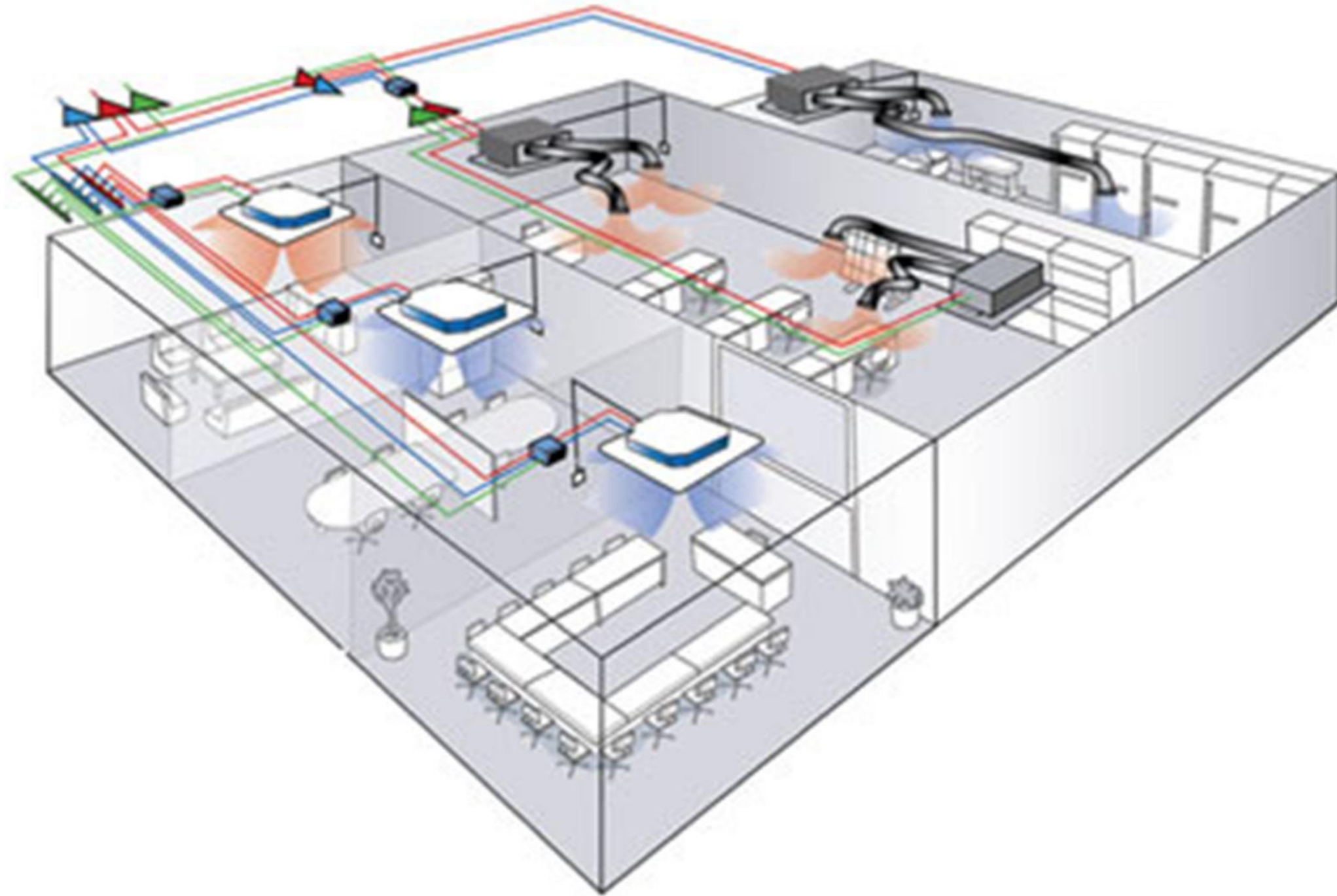
- **Annual Savings:** 7 million kWh; 15,500 MMBtu
- **Cost Effectiveness:** 2.29 (electric); 1.59 (natural gas); 1.90 (unregulated fuels)
- **Program Highlights:**
  - Awarded incentives to 28 new customers and 12 past program participants
  - Observed considerable program interest from cannabis cultivation facilities; cannabis projects constituted 22 of 40 awards made and accounted for 36% of incentive funds awarded.
  - Completed one scoping audit and one technical assistance (TA) study, representing a continued decline from previous years' activity



# C&I Prescriptive Program

- **Annual Savings:** 40 million kWh; 33,670 MMBtu
- **Cost Effectiveness:** 2.65 (electric); 8.91 (natural gas); 5.43 (unregulated fuels)
- **Program Highlights:**
  - Completed 3 targeted Funding Opportunity Notices (FONs) (initiated in FY2020)
    - School Lighting
    - Parking and Pole Lighting Retrofits
    - Packaged Terminal Heat Pump (PHTP) Retrofits in lodging sector
  - Launched 2 new FONs
    - Small Municipalities (lighting, heat pumps) – *collaboration with The Nature Conservancy*
    - Hospitality Sector (lighting, HVAC, refrigeration)
  - Added incentives for efficient refrigeration equipment for commercial kitchens, vertical PHTPs, and energy recover ventilators.

# Expanding heat pump systems into commercial buildings



- Variable refrigerant flow (**VRF**) systems
  - use heat pump technology to efficiently heat and cool building spaces
  - can simultaneously send heat and air conditioning to different rooms in the same building
- Should be considered for:
  - offices
  - hospitals
  - schools
  - long-term care facilities
  - hospitality venues, or
  - other large spaces with many rooms.

# Small Business Initiative

- **Annual Savings:** 2.2 million kWh, 11,264 MMBtu
- **Cost Effectiveness:** 1.85 (electric); 1.24 (unregulated fuels)
- **Program Highlights:**
  - Launched the program in the areas of Bucksport, Belfast, Belgrade Lakes and Lewiston
  - Completed projects that were developed in FY2020 for the areas of Calais, Dover-Foxcroft, Millinocket, and Brewer
  - Employed utility data to identify and prioritize eligible small businesses for targeted outreach (phone calls, in-person sales calls, and business-reply postcards)
  - 305 participants for lighting, 235 participants for heat pumps
  - Launched new heat pump retrofit incentive offering, along with financing option (incentivized 554 heat pumps)

# Distributor Initiatives

- **Annual Savings:** 22.5 million kWh; 17,054 MMBtu
- **Cost Effectiveness:** 2.95 (electric); 2.19 (natural gas); 4.38 (unregulated fuels)
- **Program Highlights:**
  - Processed 7,247 instant discounts for HPWHs (record high)
  - Provided discounts for 8,534 electronically commutated motor (ECM) circulator pumps (record high)
  - Discontinued incentives for efficient oil boilers and furnaces mid-year in response to fully investing the budget allocated for these systems and to new climate-focused policy priorities
  - Launched limited-time pilot for smart thermostats for natural gas customers in Bangor Natural Gas and Unitil territories

# Retail Initiatives

- **Annual Savings:** 39.1 million kWh
- **Cost Effectiveness:** 3.24 (electric)
- **Program Highlights:**
  - Processed 2,925 HPWH mail-in rebates (record high)
  - Piloted instant rebate for HPWHs at Home Depot (smartphone barcode)
  - Discounted more than 1.4 million LED bulbs

# Home Energy Savings Program

- **Annual Savings:** 53.5 million kWh; 35,006 MMBtu
- **Cost Effectiveness:** 1.85 (electric); 1.37 (unregulated fuels)
- **Program Highlights:**
  - Incentivized over 23,000 heat pumps (123% increase over FY2020)
  - Experienced relatively low demand for weatherization projects (8% decrease compared to FY2020)
  - Saw an increase in demand for financing
  - Rolled out “program liaison service,” assigning a dedicated program delivery team member to top-performing RRVs
  - Piloted online rebate processing with subset of top-performing RRVs

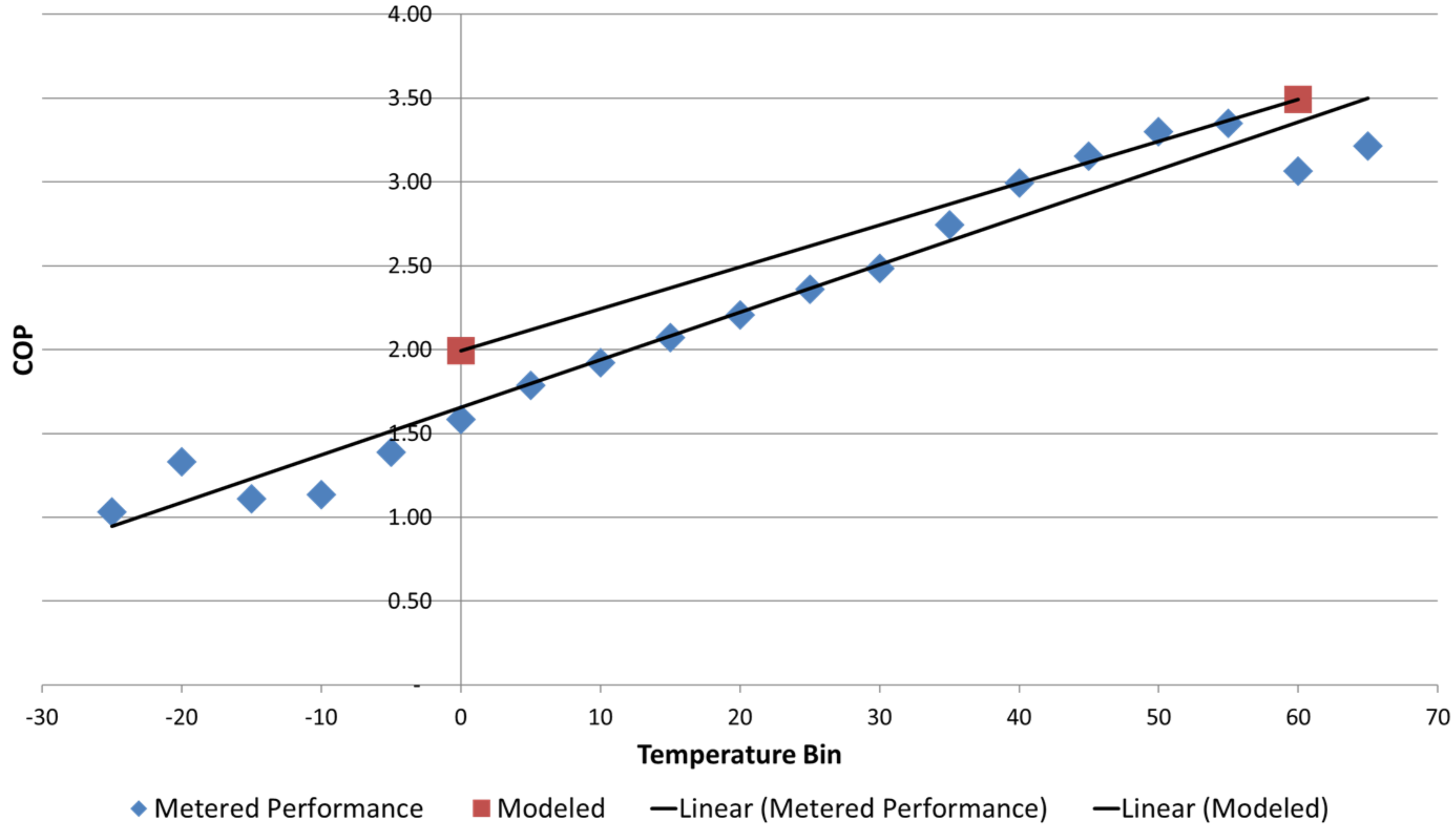
# Inspections

- Inspect 10-15% of installed measures
- In FY2021, inspected:
  - 2,591 market-rate heat pump installs
  - 224 LMI heat pumps and heat pump water heaters installs
- Virtual Inspections
  - In response to COVID-19 pandemic, using Stream video communication services
  - Inspector texts link to customer
  - Customer launches app (no download) to livestream video and still photos of the installation



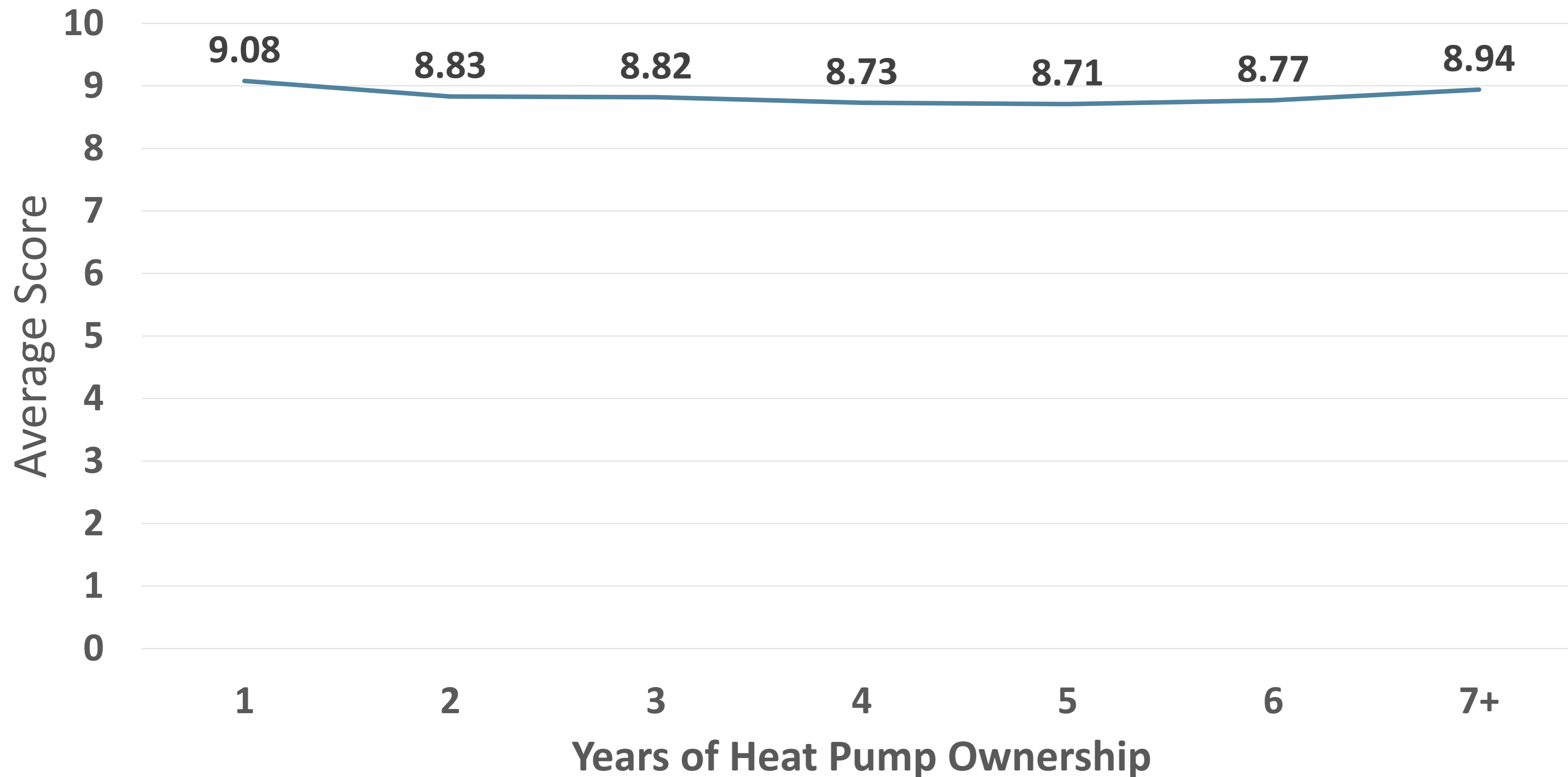
# Evaluation: Modern, High-Efficiency Heat Pumps Perform Well in Cold Weather

## Heat Pump Performance Versus Temperature





# Average Heat Pump Satisfaction (10 is best) by Length of Ownership



# Low Income Initiatives

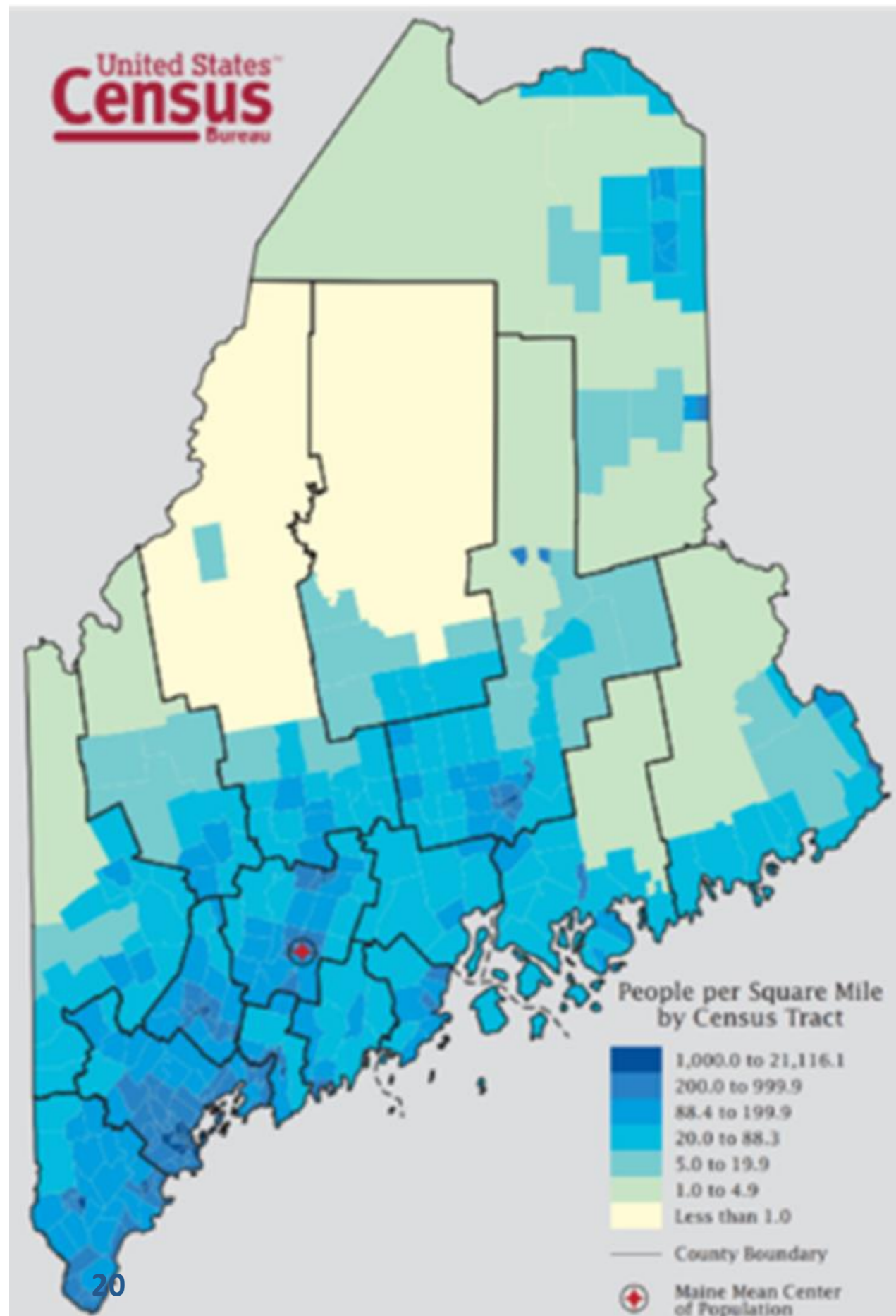
- **Annual Savings:** 10.5 million kWh; 30,630 MMBtu
- **Cost Effectiveness:** 3.99 (electric); 1.37 (unregulated fuels)
- **Initiative Highlights:**
  - Considerable uptick in market-based heat pump initiative for LMI households (1,213 heat pumps installed in FY2021 vs. 312 in FY2020)
  - Installed 557 HPWHs in low-income homes with electric resistance water heaters (vs. 781 in FY2020)
  - Launched new incentives for tankless coil replacements in the spring
  - Launched pilot direct installation weatherization initiative
  - Launched Affordable Housing Pilot, providing incentives for developers to upgrade designs to meet Passive House standards

# Low Income Initiatives

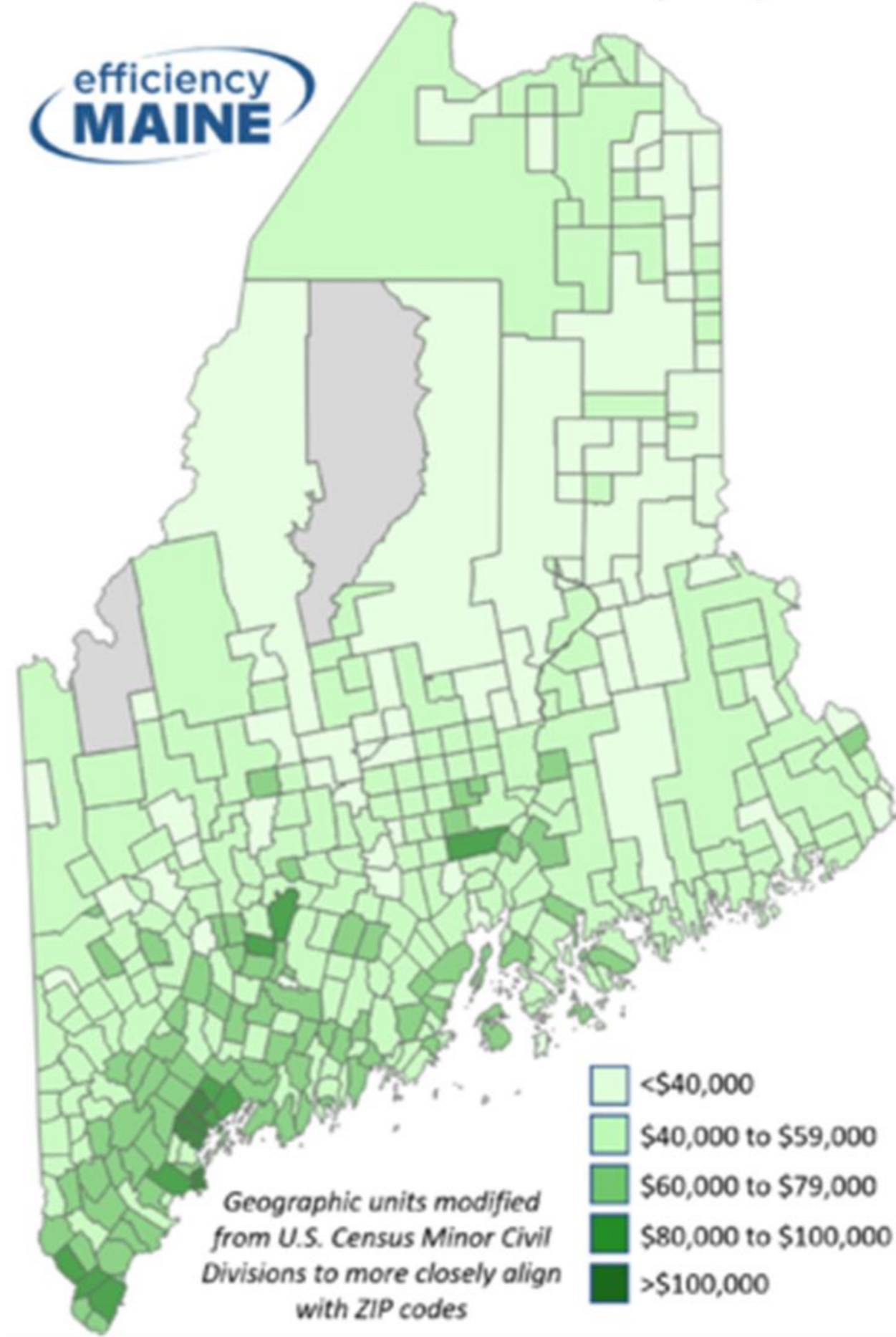
- **Annual Savings:** 10.5 million kWh; 30,630 MMBtu
- **Cost Effectiveness:** 3.99 (electric); 1.37 (unregulated fuels)
- **Initiative Highlights:**
  - 185 homes upgraded with improved building envelope insulation and air sealing;
  - 1,194 high-performance, cold-climate heat pumps installed;
  - 1,039 households with a heat pump water heater installed;
  - 77,203 LED bulbs delivered;
  - 20,139 faucet aerators delivered;
  - 6,774 low-flow showerheads delivered;
  - Marketing materials mailed directly to income-eligible households:
    - 29,200 households for the heat pump water heater promotion;
    - 208,797 invitations for LED, low-flow devices, and other LI Initiatives;
  - \$29,172,853 in reduced energy bills over the lifetime of the measures installed;
  - \$5,333,228 expended by the Trust for administration and incentives in the LI Initiatives

# Equity Issues -- Distribution of Heat Pump Rebates (Residential) Excels in Rural and Northern Maine

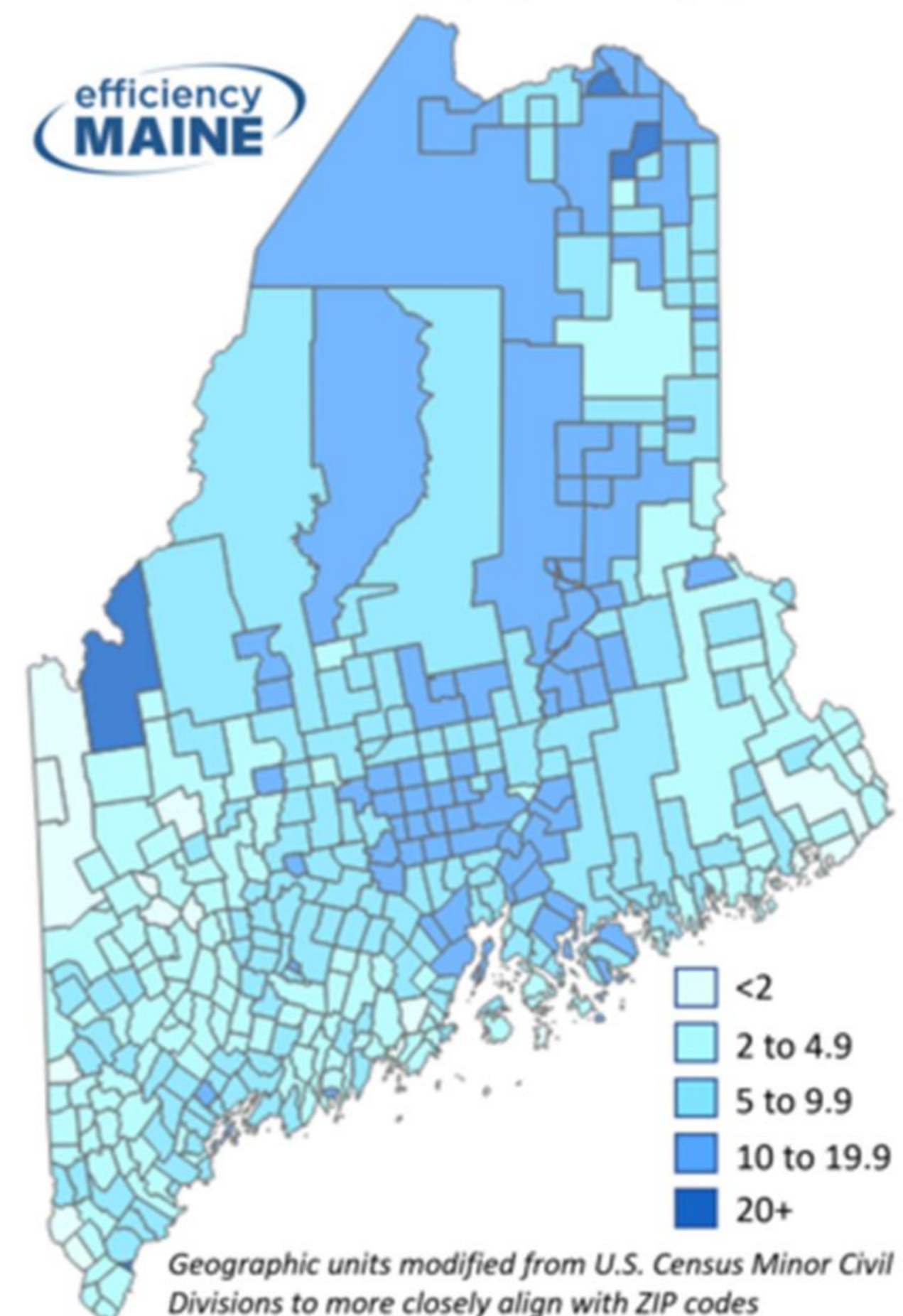
Population Density by Census Tract



Median Household Income (2018)



Number of Heat Pumps per 100 population



# Electric Vehicle Initiatives

- **Annual Savings:** -3.1 million kWh; 62,876 MMBtu (1 million MMBTY lifetime)
- **Cost Effectiveness:** 1.01
- **Initiative Highlights:**
  - Completed Phase I of the state's effort to establish Level 3 and Level 2 chargers at 7 targeted locations along priority corridors
  - Awarded funds to install 86 public Level 2 charger plugs across 23 sites and 14 public Level 3 chargers across 7 sites
  - Incentivized 1,127 vehicles (512 battery EVs and 615 plug-in hybrid EVs)
  - For low-income customers – increased rebates, expanded to used EVs
  - Launched promotional incentives for governmental entities, tribal governments, and select non-profits (for EVs and Level 2 chargers)

# Building Out Maine's EV Charger Network

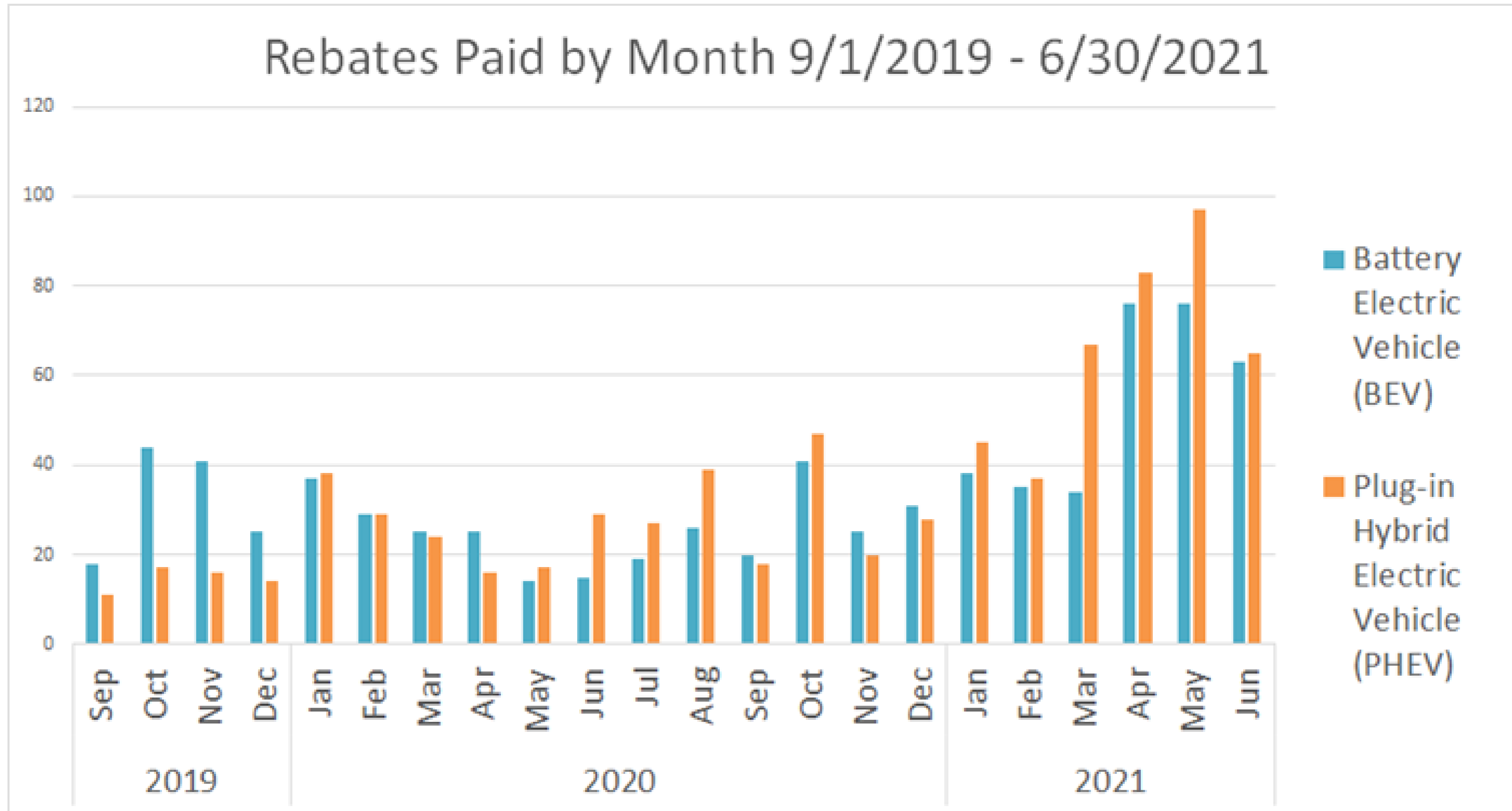
Since 2018, EMT's EV Charger Program has delivered:

- DC Fast Chargers
  - 14 plugs installed @ 7 sites (6 more plugs to be added in 2022)
  - 14 plugs awarded @ 7 sites (under construction)
- Level 2 Chargers
  - 206 plugs installed at more than 50 locations including business, apartments, municipalities, state government buildings
- Total public chargers available in Maine now
  - 500+ Level 2 plugs
  - 135 DCFC (high speed) plugs

Map shows ALL sites of public EV chargers, including privately funded stations (not funded by EMT program)



# EV Rebates for Vehicles under \$50k MSRP



# Evaluation, Measurement & Verification

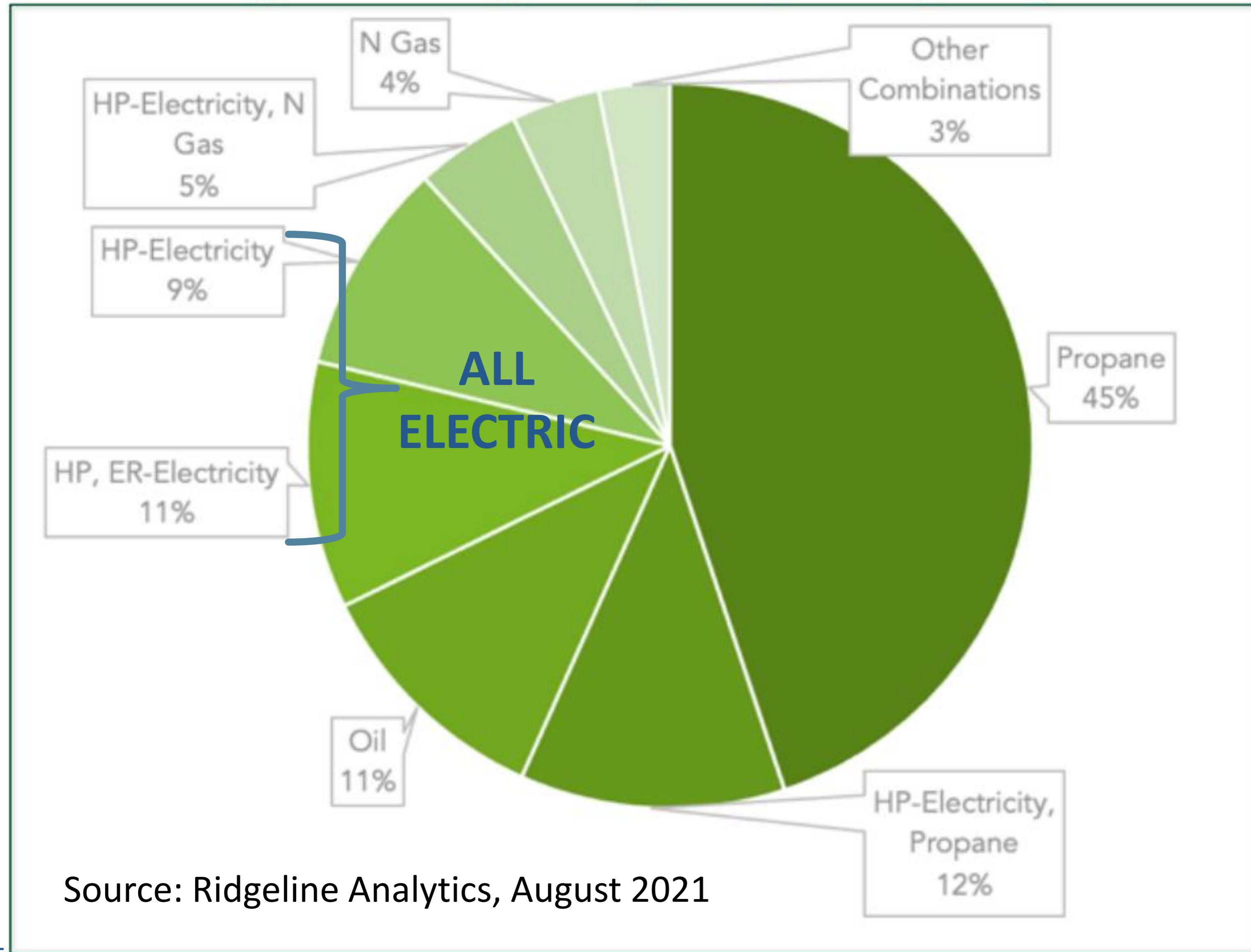
- **FY2021 Activity:**

- Triennial Plan Studies and Proceedings
  - Baseline Assessment of Residential New Construction
  - Baseline Assessment of HVAC Equipment in Businesses
  - Update of 2018 Lighting Opportunity Projections
  - Custom, Refrigeration and Compressed Air Potential Assessment
  - Non-Transmission Alternative Assessment
  - Demand Management Program Assessment
  - Storage Demand Response Study
  - Statewide Marginal Avoided Costs for the Electricity T&D
- Technical Reference Manual (TRM) Updates
- FCM M&V Compliance Review
- Customer Surveys and Program Evaluations



# Baseline Assessment of Residential New Construction

Figure 5. Primary Heating Fuel by Count (n=127)



- Developers and consumers are finding it cheaper to go all electric when building new homes
- New homes built in Maine in the past three years:
  - 20% all electric
  - 37% have at least 1 heat pump

# Innovation

- **FY2021 Activity:**

- Completed the Aggregated Demand Energy Resource (DER) Load Management Pilot
- Monitored progress on the Level 2 Electric Vehicle (EV) Smart Charging Study
- Monitored progress on the Commercial Battery Storage Load Management Pilot
- Launched the Cold Storage Facility Load Management Pilot
- Launched the Isle au Haut Thermal Energy Storage Load Management Pilot
- Launched the Commercial Split-System Heat Pump Water Heater Demonstration Pilot.
- Launched the Heat Pump Optimization with Integrated Thermostats Pilot
- Awarded a contract for the Whole Home Heat Pump Solutions Pilot

# Other Initiatives

- **Prescribed Initiatives:**

- Non-Wires Alternatives
- Agricultural Fair Assistance Program
- Energy Storage

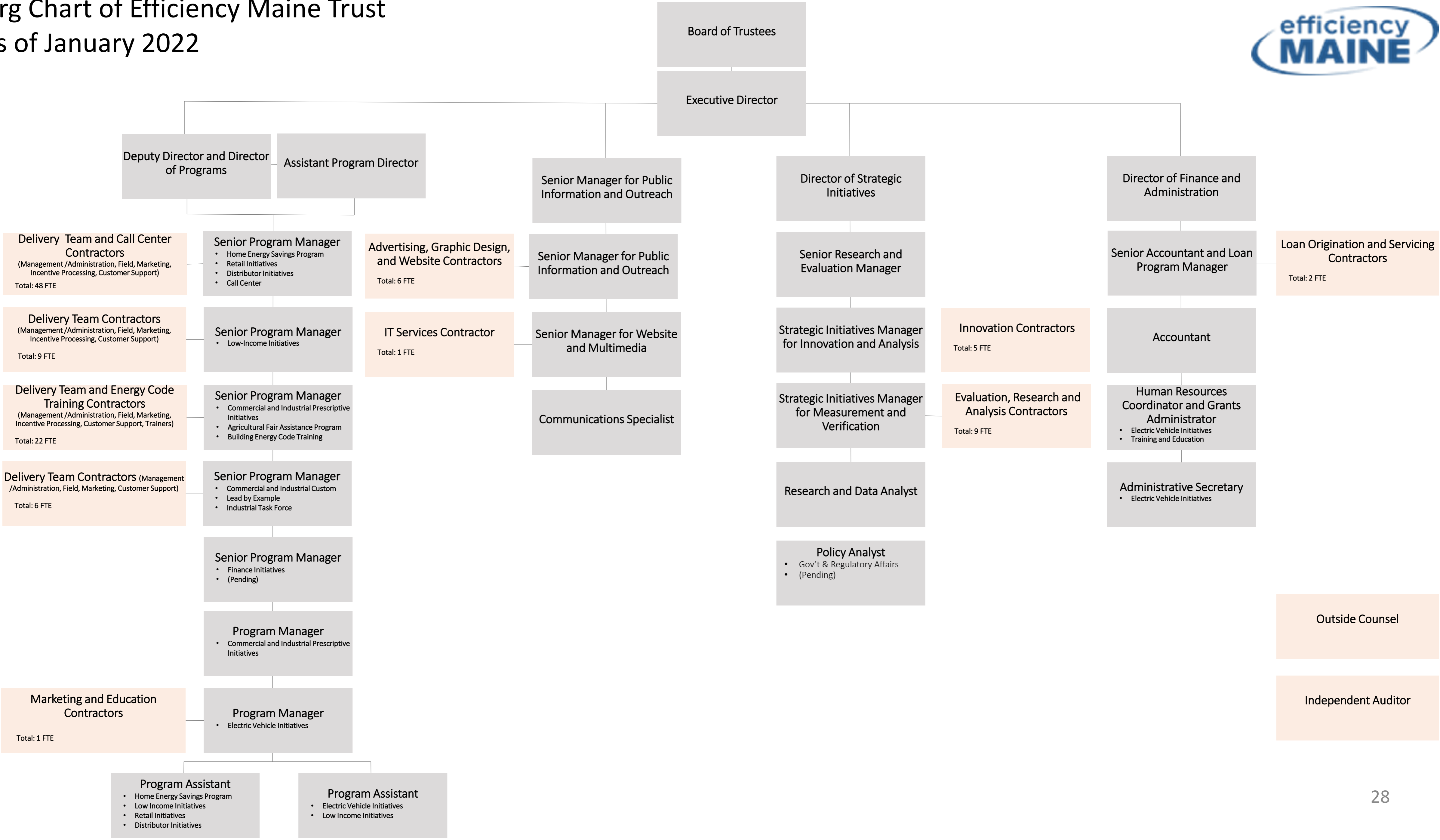
- **Regional and National Initiatives:**

- ISO-New England
- Regional Greenhouse Gas Initiative (RGGI)

- **Participation in State Activities:**

- Legislature
- Governor's Energy Office and Governor's Office of Policy innovation and the Future
- MaineHousing WAP & LIHEAP
- Public Utilities Commission
- Department of Environmental Protection
- Maine Climate Council
- Lead by Example Initiative
- Arrearage Management Program
- Workforce Development
- Building Energy Codes (MUBEC)

# Org Chart of Efficiency Maine Trust As of January 2022





# Thank you.

Michael D. Stoddard  
Executive Director