



TRIENNIAL PLAN IV OPPORTUNITY ASSESSMENT

DRAFT August 10, 2018

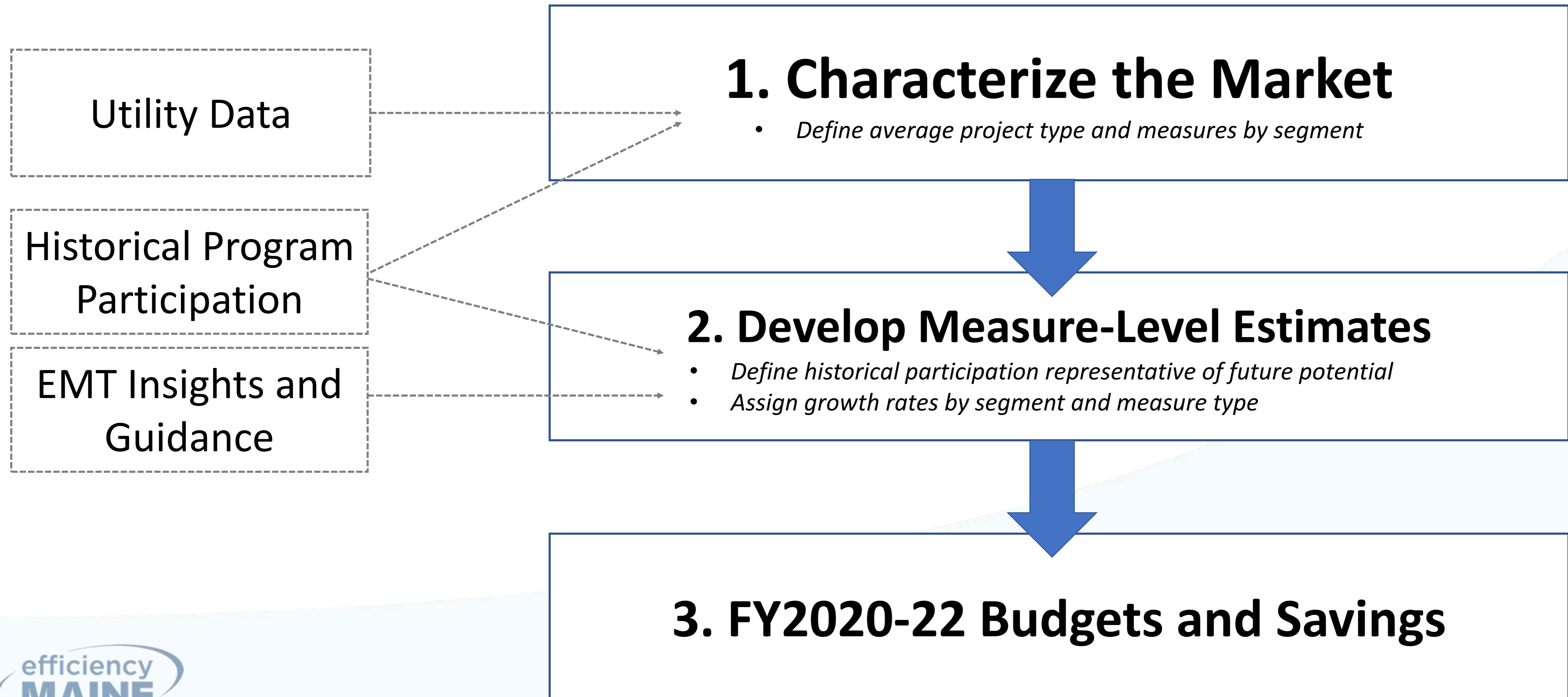




C&I Custom Program

Methodology Overview

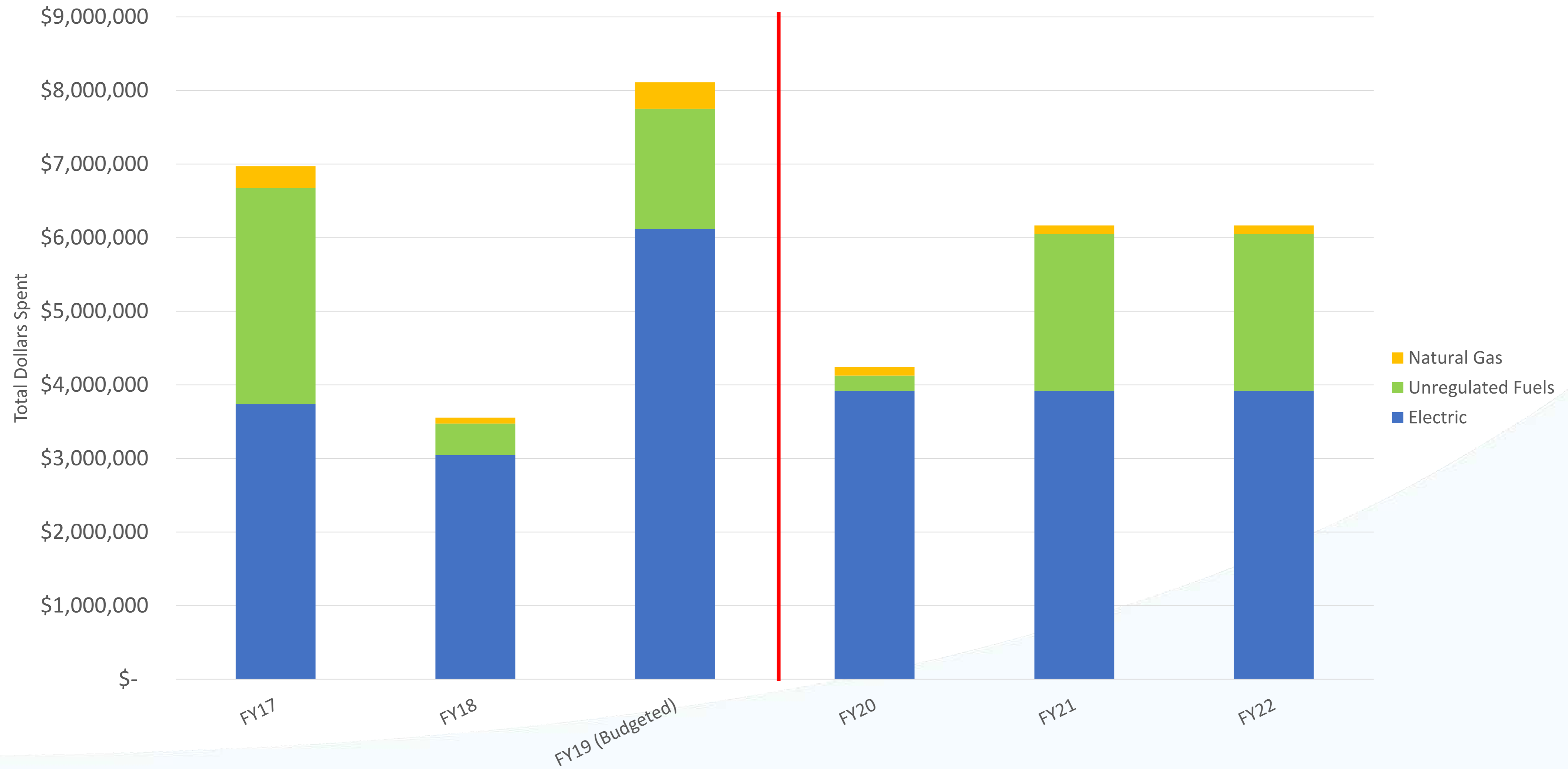
Applied Energy Group (AEG) Custom, Refrigeration and Compressed Air Potential Study



C&I Custom Program Opportunity Drivers

- Activity in the C&I Custom Program has diminished in recent years, due to several **key drivers**:
 - Paper industry participation in the program is declining as is the overall size of that market
 - Large lighting projects have transitioned to the C&I Prescriptive Program (represented large portion of the program as recently as FY16)
 - Inclusion of operation and maintenance (O&M) as a cost screens out small combined heat and power (CHP) Projects
 - Regional Greenhouse Gas Initiative (RGGI) fund disbursements to “Affected Customers” have reduced the participation of large customers in unregulated fuels programs

Custom Program Budget Overview





C&I Prescriptive Program

C&I Prescriptive Measure Categories

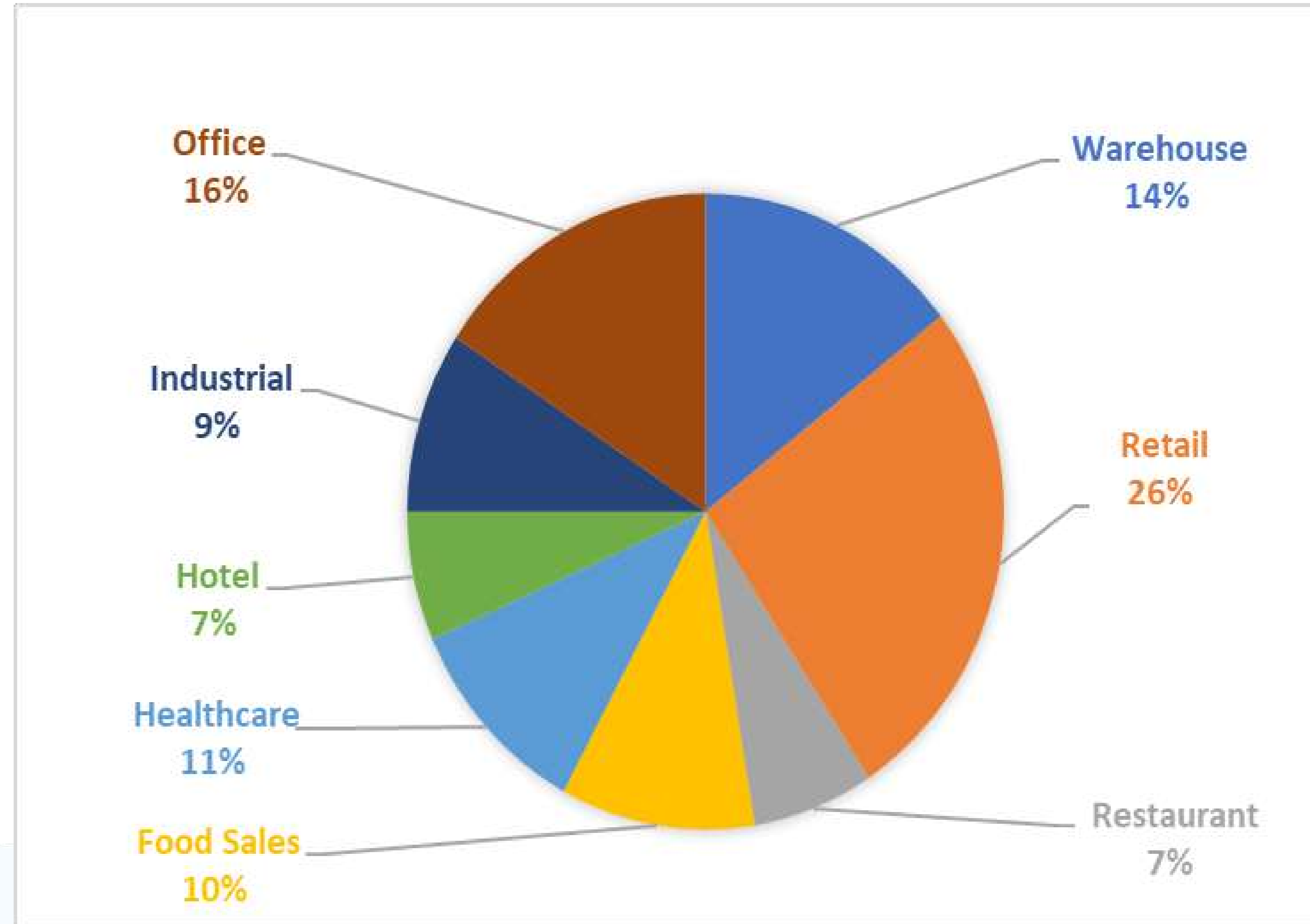
- Lighting
 - Cadmus State of Commercial and Industrial (C&I) Lighting in Maine Study
- Refrigeration & Compressed Air
 - AEG Custom, Refrigeration, and Compressed Air Potential study (participant and non-participant analysis)
- Ductless Heat Pumps (DHPs)
- Large HVAC
- Agriculture
- DIY (Spray Valves)

C&I Lighting Study: Sample Design and Study Recruitment

- Designed study by focusing on eight facility types that comprise about 232 million square feet:
 - Office
 - Retail
 - Hotel
 - Restaurant
 - Food Sales
 - Healthcare
 - Warehouse
 - Industrial
- The study allocated the number site visits per facility type, and then selected sites within these facility types.

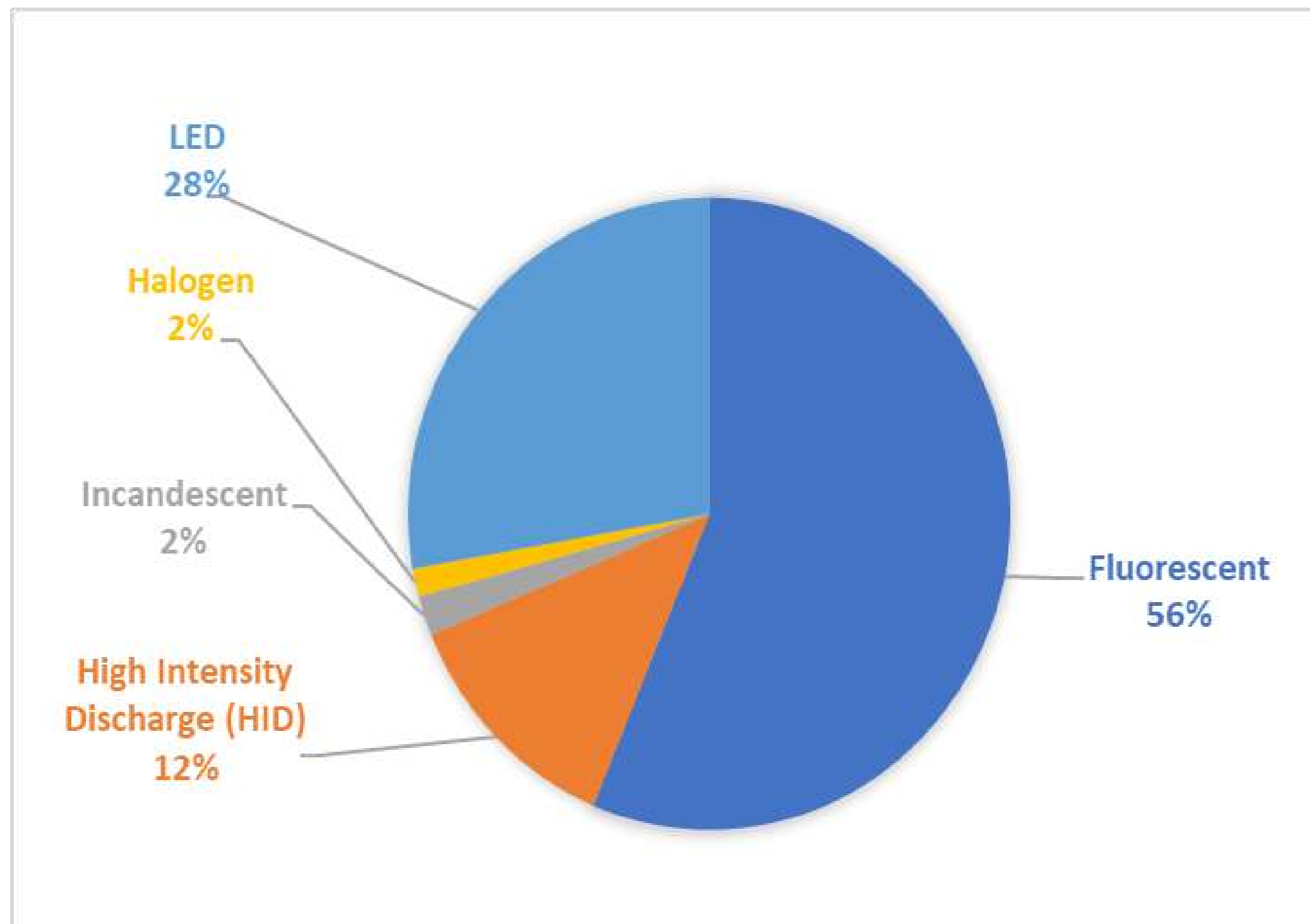
C&I Lighting Study: Site Visits by Facility Type

- Visited 76 facilities
- Directly audited 5.4 million square feet of floor space
- Data gathered:
 - space area
 - lamp wattage
 - ballast data where possible
 - lamp counts

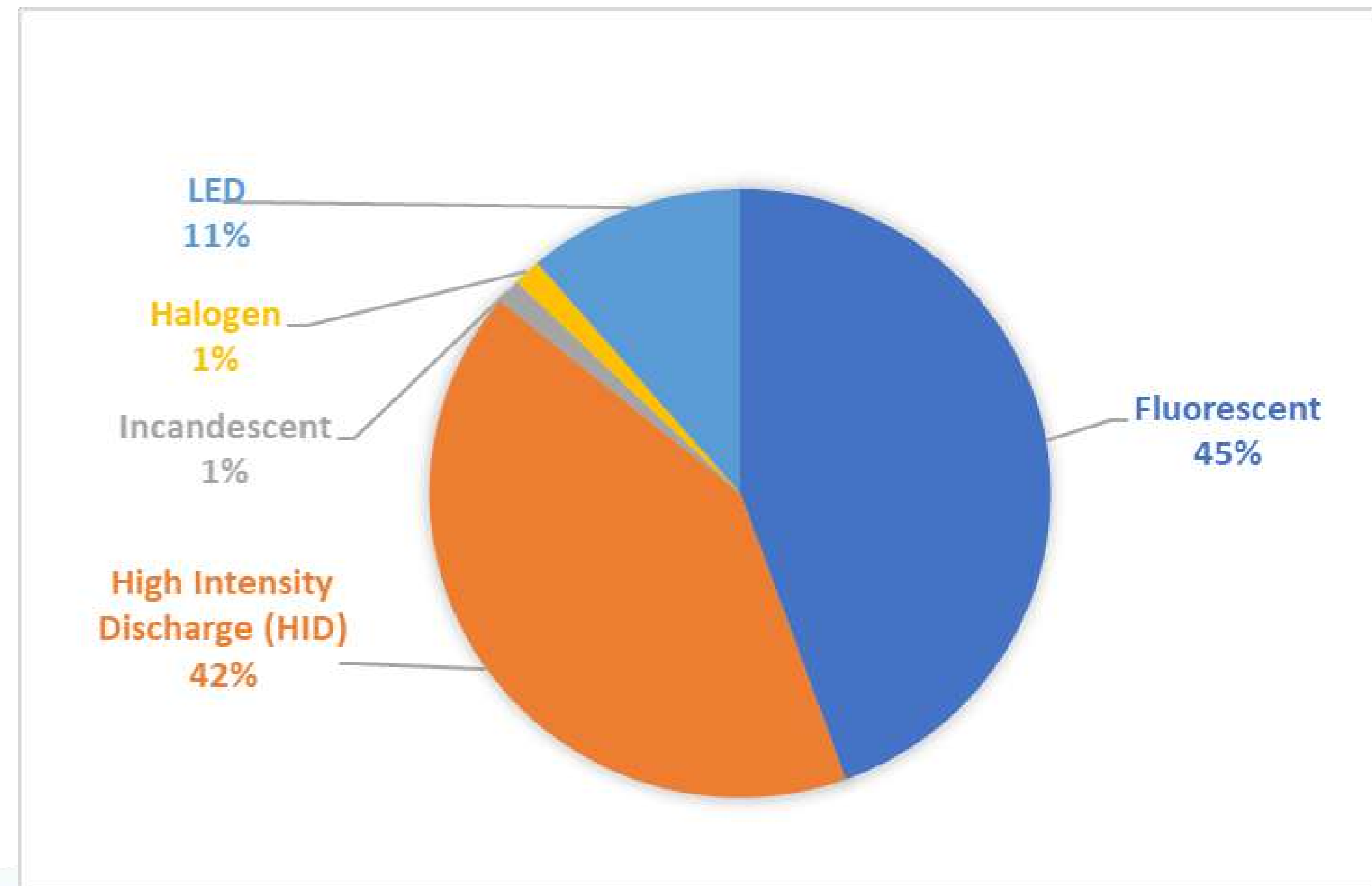


C&I Lighting Study: Installed Lighting Technology

By Fixture Count



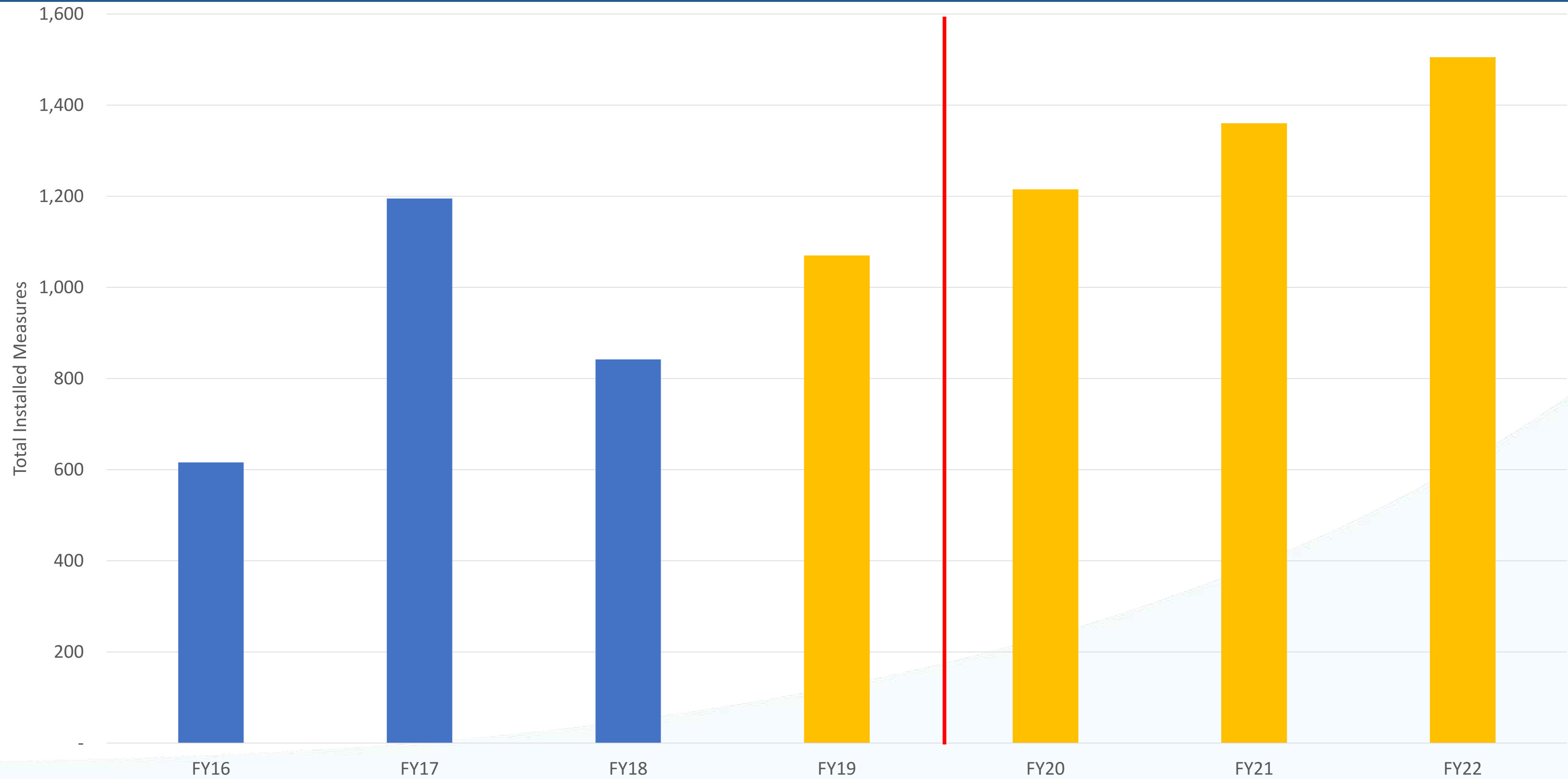
By Wattage



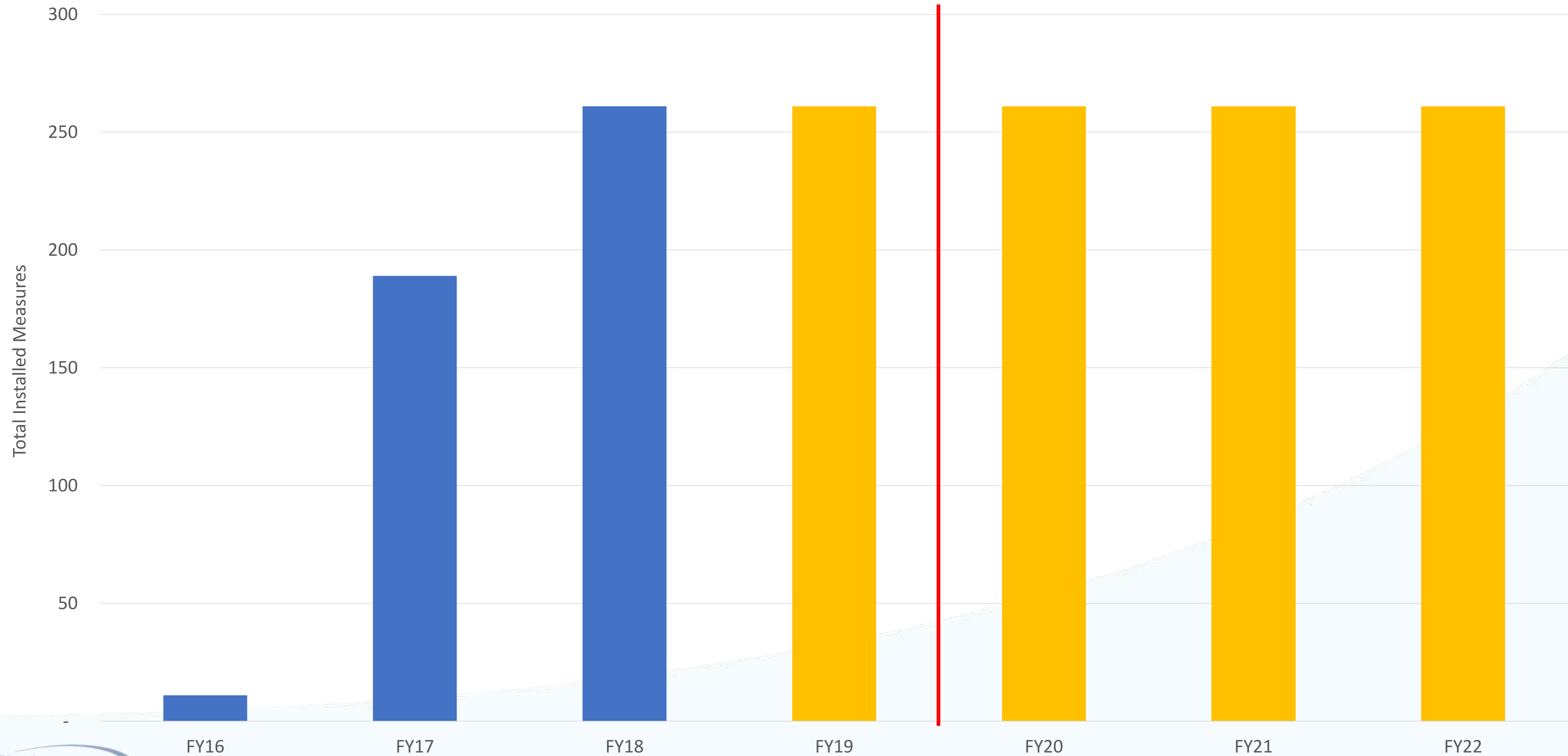
Budget Basis for Retrofit Lighting

- Statewide potential cost-effective savings: 372,727,587 kWh/y
- Target 10% of potential savings/y (10-year conversion): 37,273,000 kWh/y/y
- Historical program participation: 60% incentive level can achieve ~40,000,000 kWh/y
- Statewide potential can be procured at \$0.44/kWh (total installed cost)
- Program incentive budget at 60%: \$9.84 M/y
- Program delivery: \$1.42 M/y
- Total program budget: \$11.27 M/y

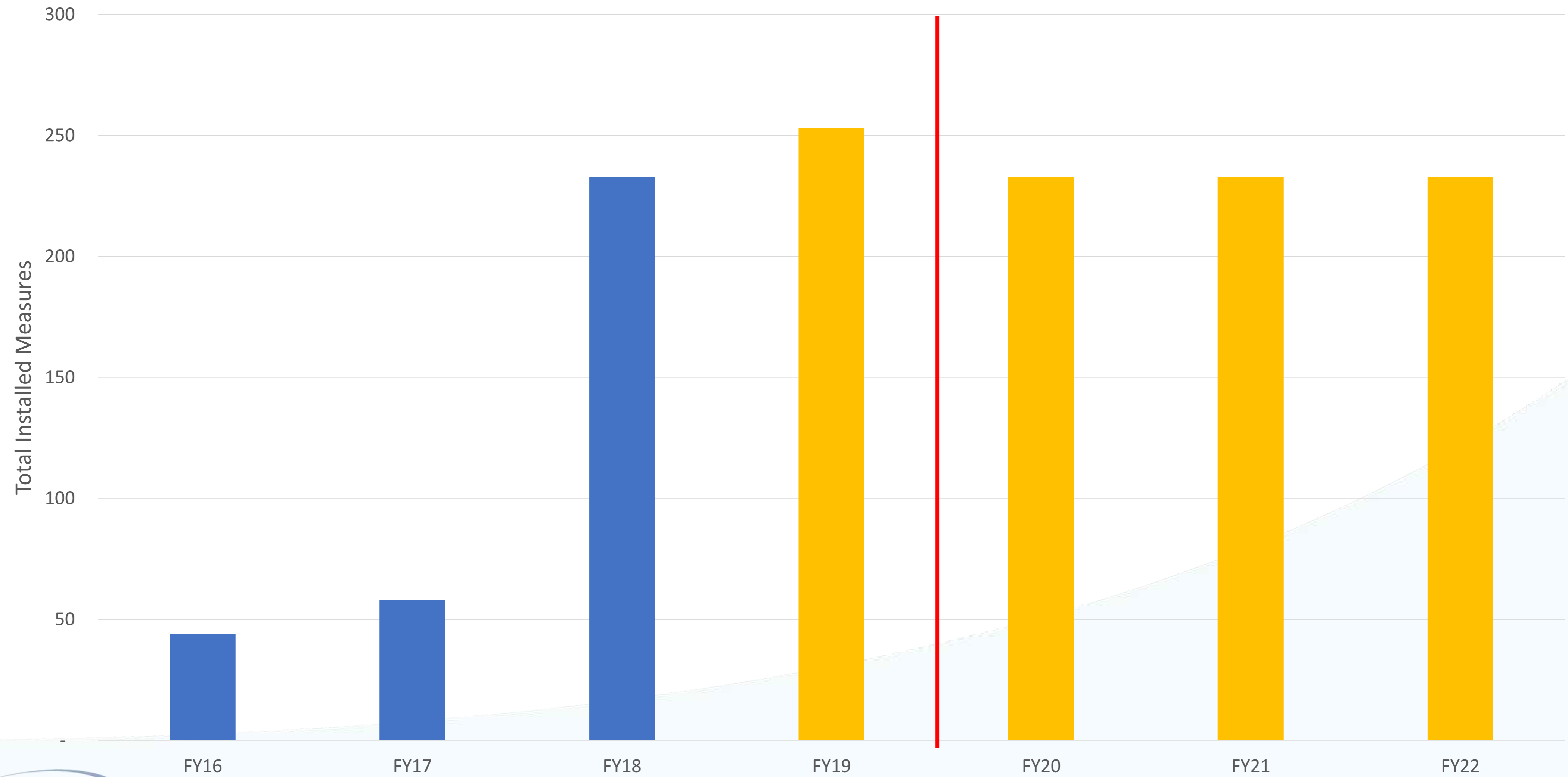
Commercial DHP Installations (# of Outdoor Units)



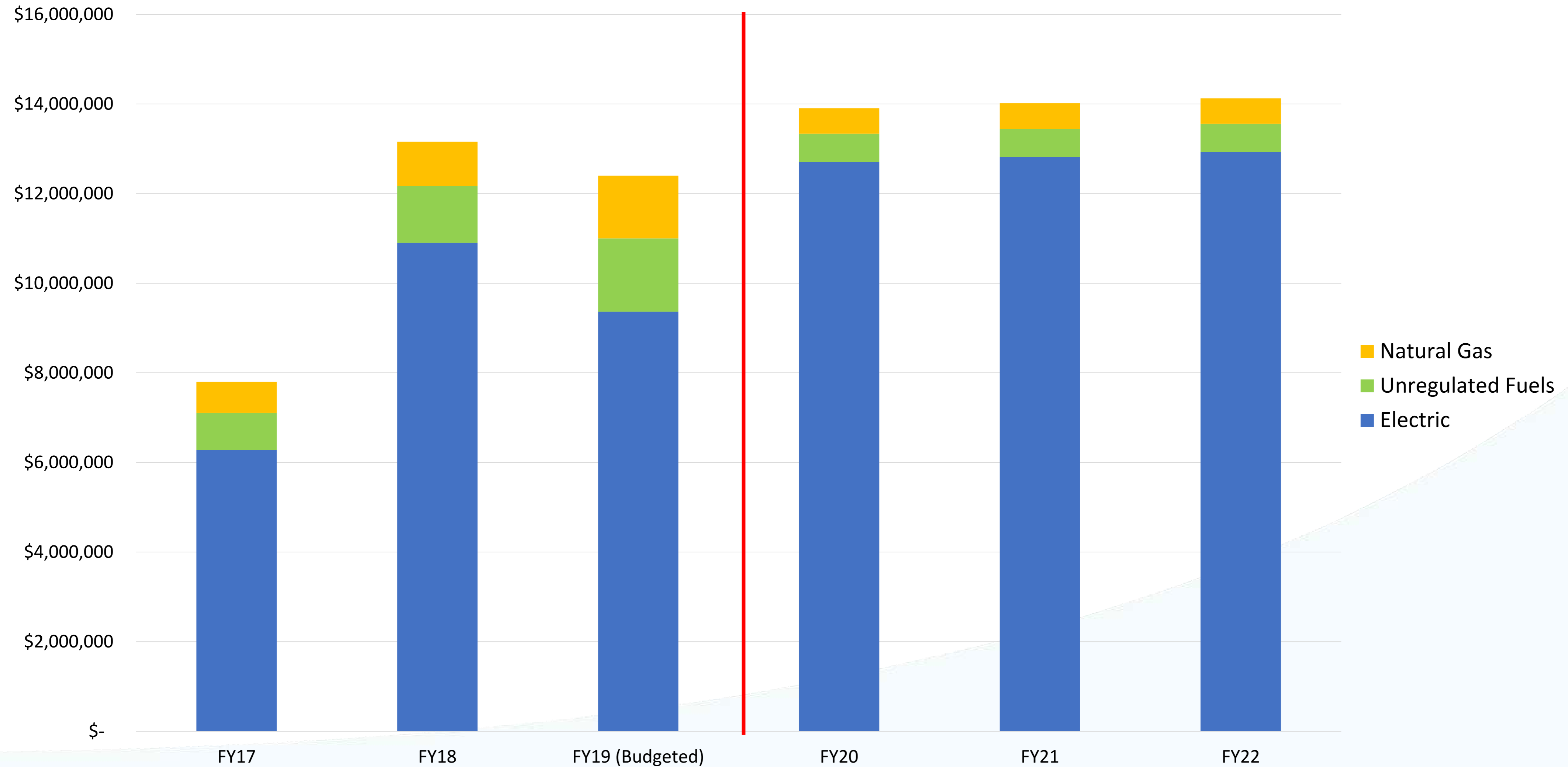
Other Electric Measures



Natural Gas Measures



C&I Prescriptive Budget Overview



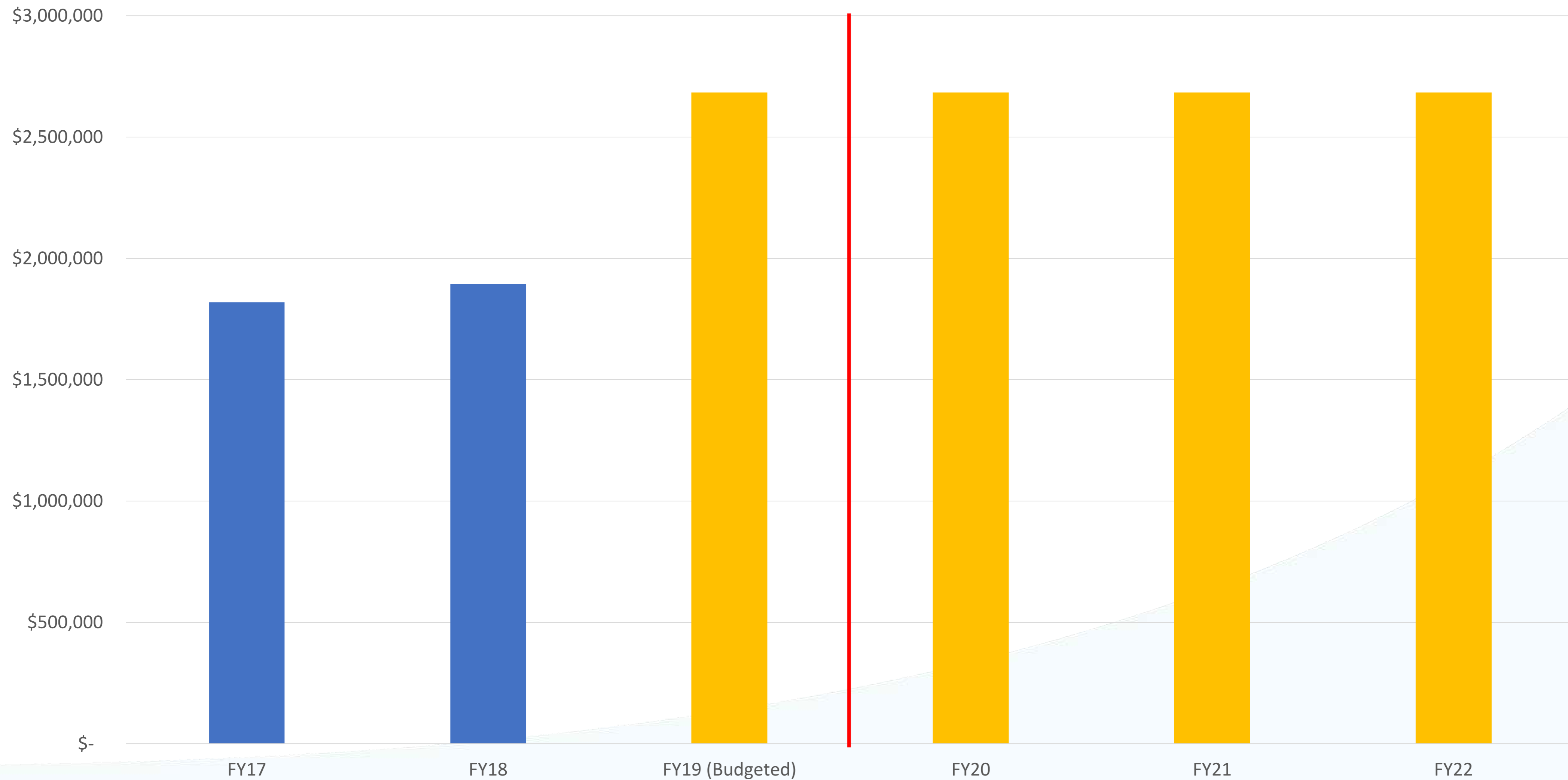


Small Business Initiative

Small Business Initiative

- Measures:
 - Focus on retrofit lighting
- Opportunity analysis:
 - Cadmus State of Commercial and Industrial (C&I) Lighting in Maine Study

Small Business Initiative Budget Overview





Low-Income Initiatives

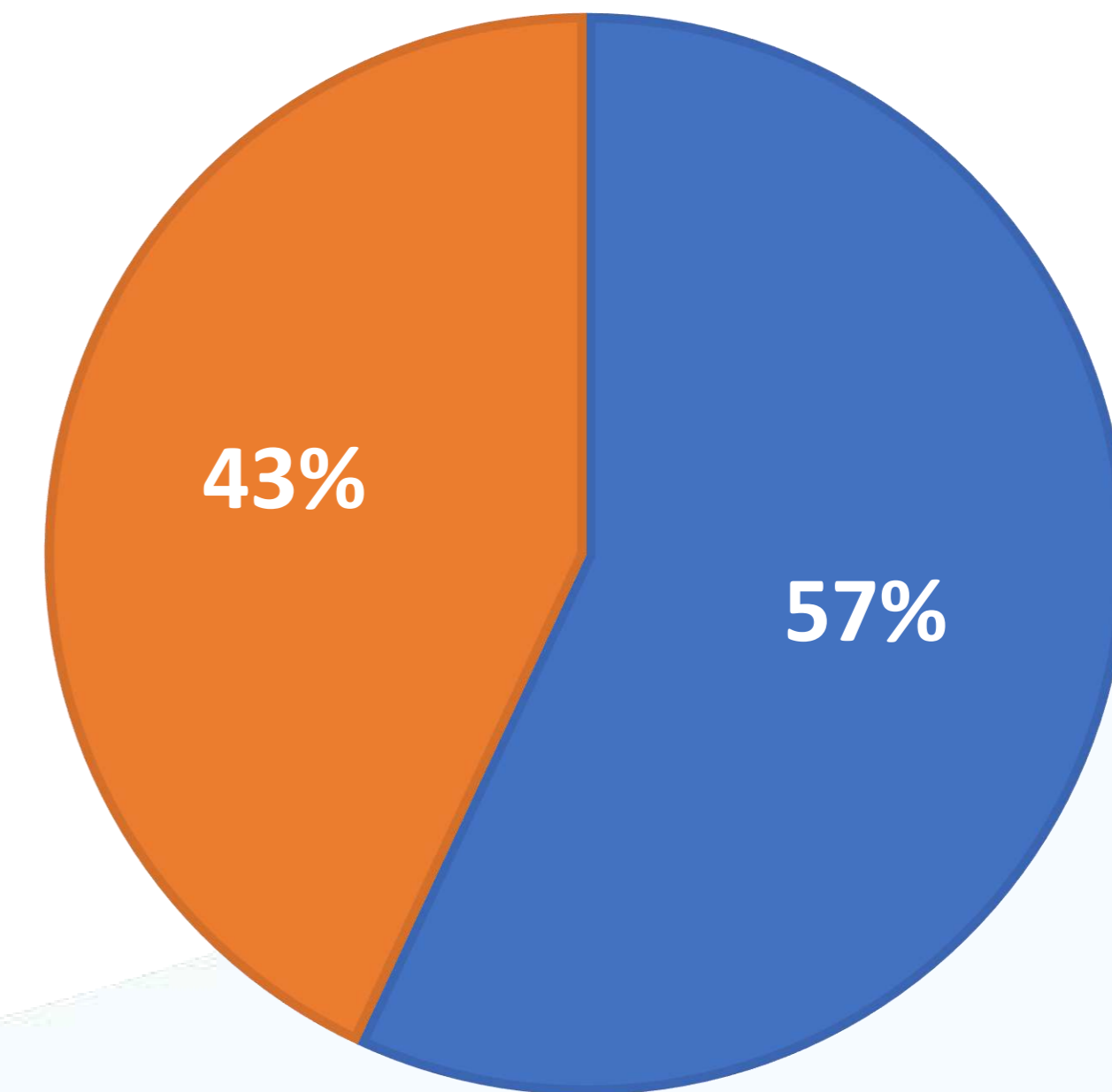
Low-Income Initiatives Overview

- **Market-based initiatives:**
 - Target emergency heat pump water heater (HPWH) replacements through Retail Initiatives and Distributor Initiatives
 - Continue providing enhanced home weatherization, heating system, and DHP incentives through the Affordable Heat Initiative (prioritize FY20 allocation of available RGGI funds to maintain FY19 success)
- **Direct-install initiatives:**
 - Target Arrearage Management Program (AMP) participants in good standing
 - Target natural gas projects (10% natural gas budget allocation)
- **Direct-mail initiative** for small energy-saving devices
- **Opportunity Studies:**
 - Office of the Public Advocate 2018 Maine Low-Income Household Energy Efficiency Baseline Study
 - 2019 Low Income Electric Heating and Cooling Analysis (Convergence Data Analytics – CDA)

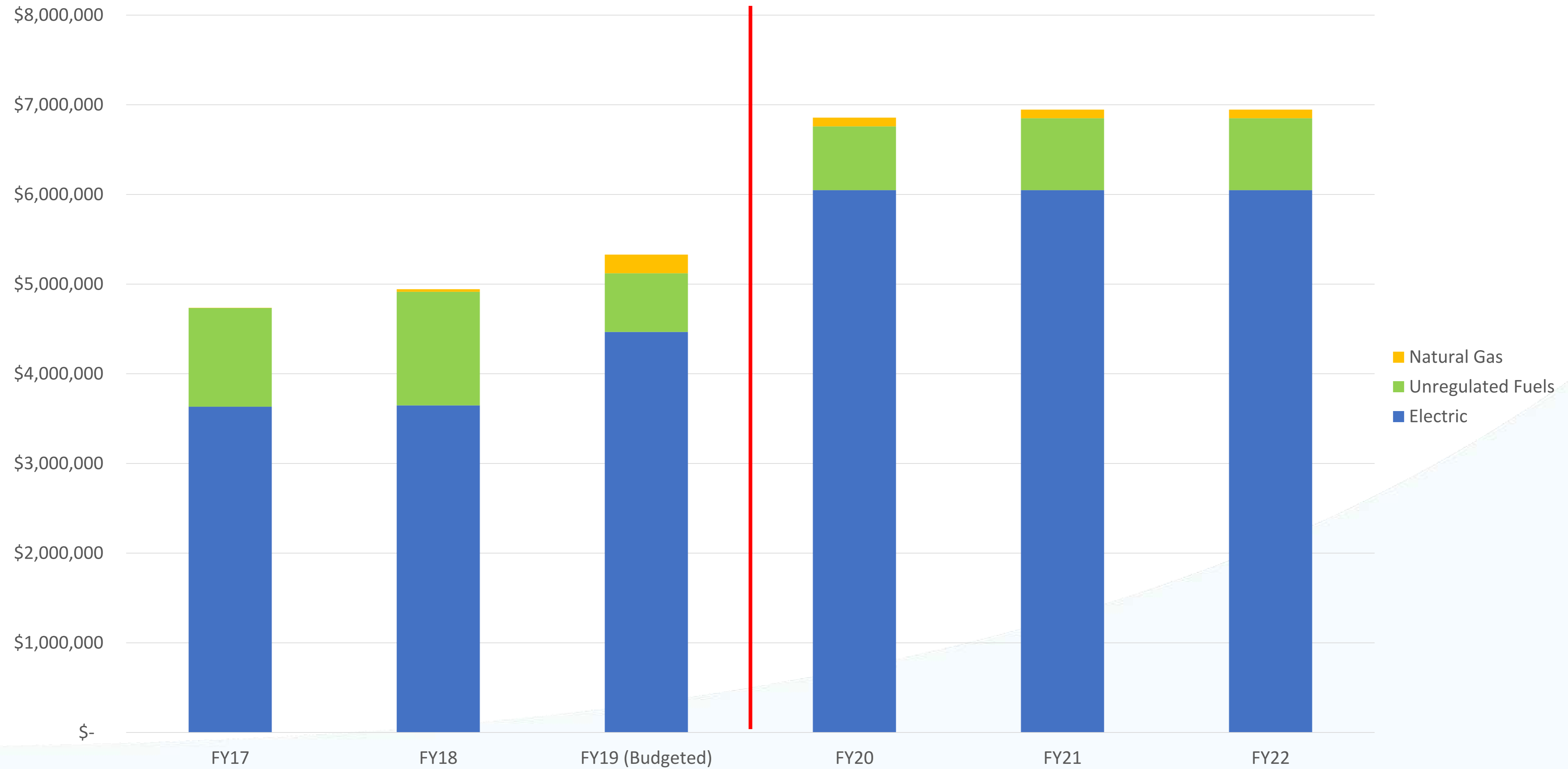
Electric Resistance Water Heaters

- Total electric resistance water heaters in Maine: **137,777**
 - **(550,109 * 25%)**
- Total electric resistance water heaters in low-income households: **84,000**
 - **(175,000 * 48%)**
- Expected useful life of Tanks = **10 Years**
- Annual Burn outs:
 - **8,400** (Low Income)
 - **5,377** (Non-Low Income)
- Applicability
 - **72%** (Low Income)
 - **85%** (Non-Low Income)
- Convertible Burnout
 - **6,048** (Low Income)
 - **4,571** (Non-Low Income)

■ Low Income
■ Non-Low Income



Low Income Budget

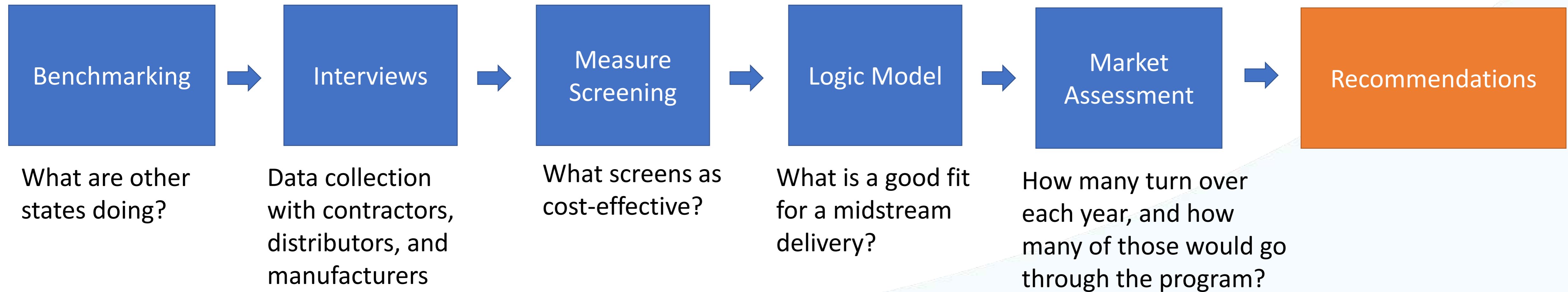




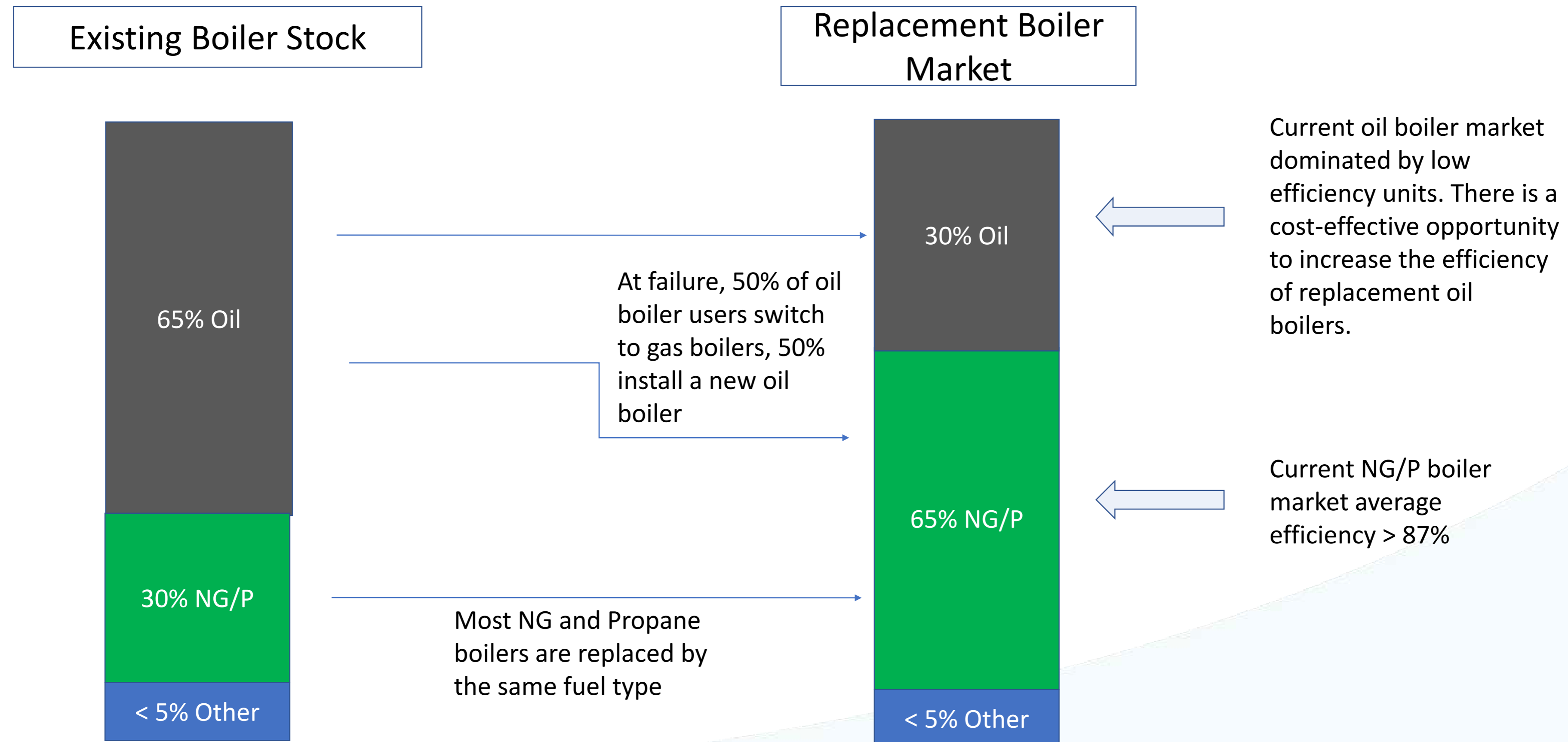
Distributor Initiatives

Distributor Initiatives: Opportunity Methodology

- Midstream HVAC Potential Study (Michael's Energy)
 - Built on a similar study done last year on C&I HVAC measures
 - Looked at current residential HVAC measures and new measures



Distributor Initiatives: Residential Boiler Market



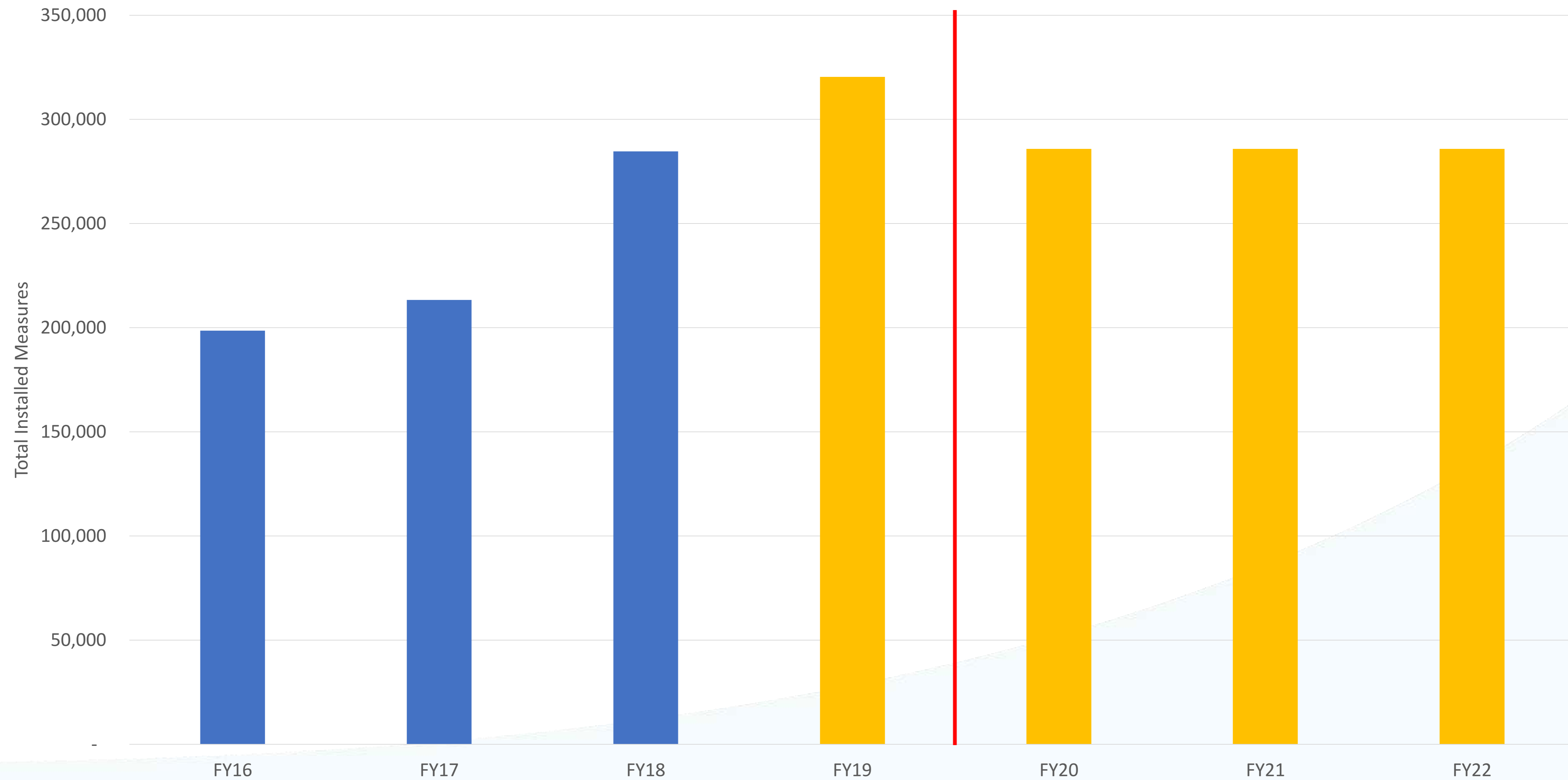
Smart Pump Opportunity

- Smart pumps = high-efficiency circulator pumps with integrated VFDs, sold with new boilers (lost opportunity)
- Efficiency Vermont runs a successful smart pump program that captures approximately 50% of the replacement market
- The Maine market currently has very low penetration (~10%) of this technology
- Aggressive incentives would be needed to jump-start the market in Maine
- With appropriate incentive levels, Efficiency Maine could capture ~80% of the market (23,000/year)

Heat Pump Water Heaters

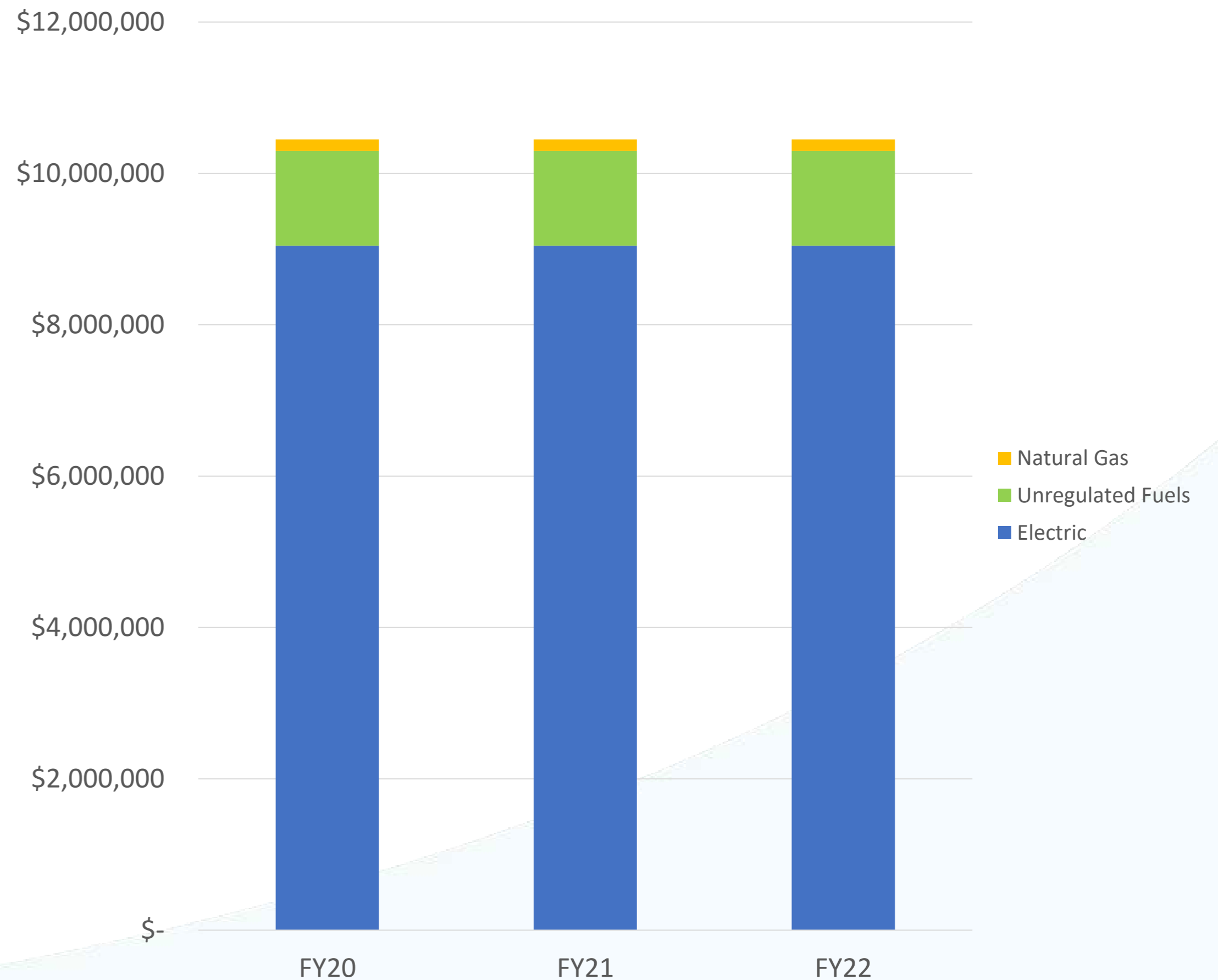
- Builds on the successful current HPWH distributor measure
- Employs incentives designed to minimize free-ridership and maximize cost-effective savings
- Estimate that 6,500 HPWHs (65%) will go through the Distributor Initiatives channel annually

Distributor Lighting Installed Measures



Distributor Initiatives Budget Overview

- Historical Program Design
 - Began with DSIL (Distributor Screw-In LEDs) in FY17
 - Added furnaces and boilers in FY18
 - Added Linear Lamp Replacement LEDs and Mogul LEDs in FY18
 - Introduced HPWHs in FY18
- Catching on with distributors and contractors
- Captures larger share of opportunities for new construction or replace-on-burnout
- Plan shifts furnaces/boilers, water heaters, DSIL and certain other lights to this channel (nets them out of CIP and Retail Initiatives)





Retail Initiatives

Retail Initiatives Measures

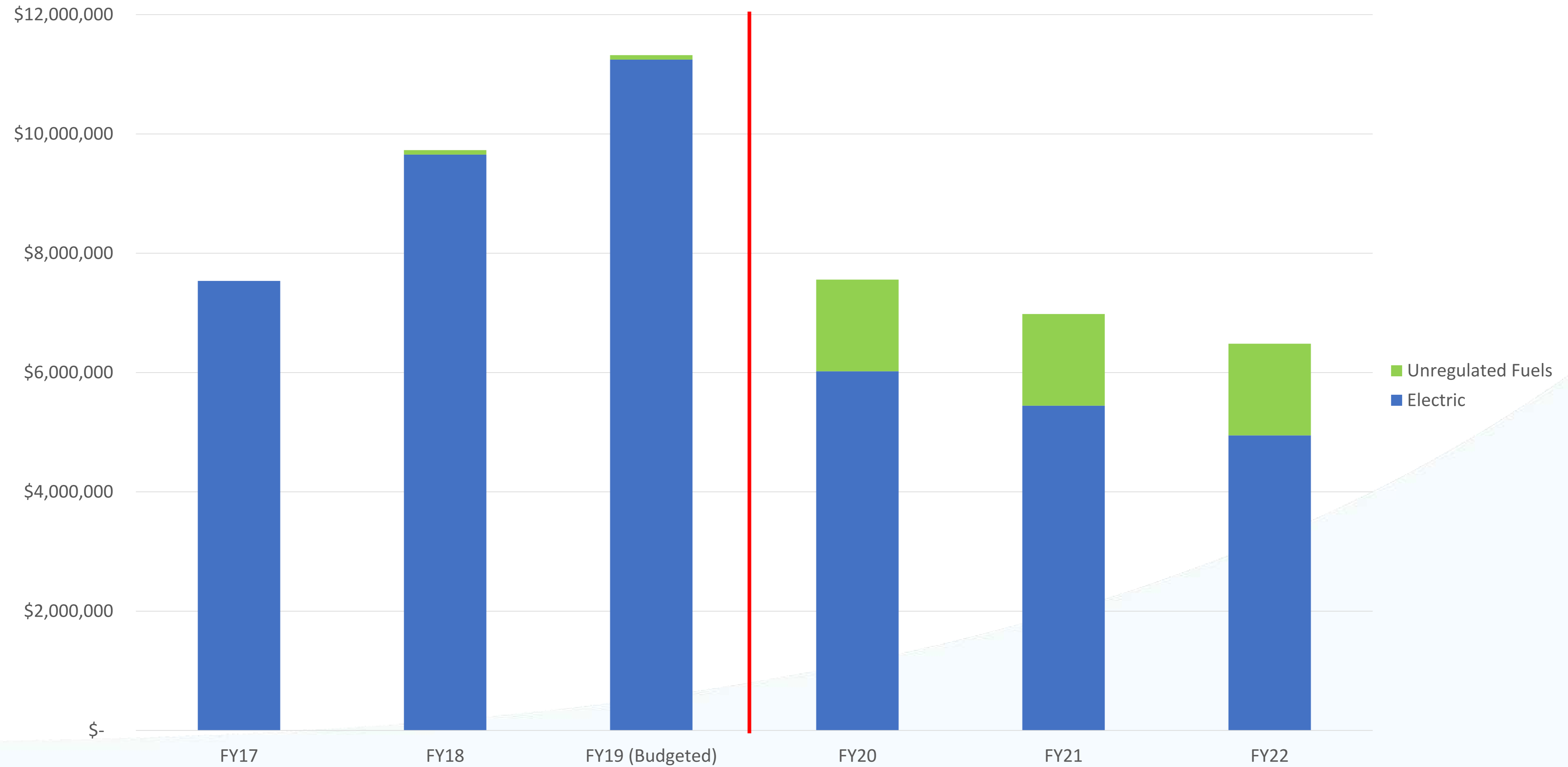
- Appliances: clothes washers, HPWHs, and room air purifiers
- Wood and pellet stoves (transferred from the Home Energy Savings Program)
- LED lighting

Retail Initiatives: LED Opportunity

- 2015 NMR Retail Lighting Evaluation found an average of 69 light sockets in Maine residences
- 48% of those sockets convertible to high-efficiency LEDs
- Extrapolated to 18.5M convertible sockets statewide in 2015
- 2015-2017 Efficiency Maine incentivized 6.5M residential light bulbs, leaving 12M convertible sockets
- Inefficient bulbs last 2.7 years, resulting in 4.4M burnouts in FY18
- EMT incentivized 1.67M residential bulbs in FY18 – 38% of the predicted annual burnout
- Assuming a fixed adoption rate of 38% and taking the declining convertible sockets into account, annual residential incentivized bulb counts were projected for FY2020, FY2021 and FY2022
- Bulb counts adjusted for non-residential sales through retail initiative and residential sales through distributors

Year	Retail Bulbs
2020	1,130,033
2021	973,490
2022	838,633

Retail Initiative Budget Overview



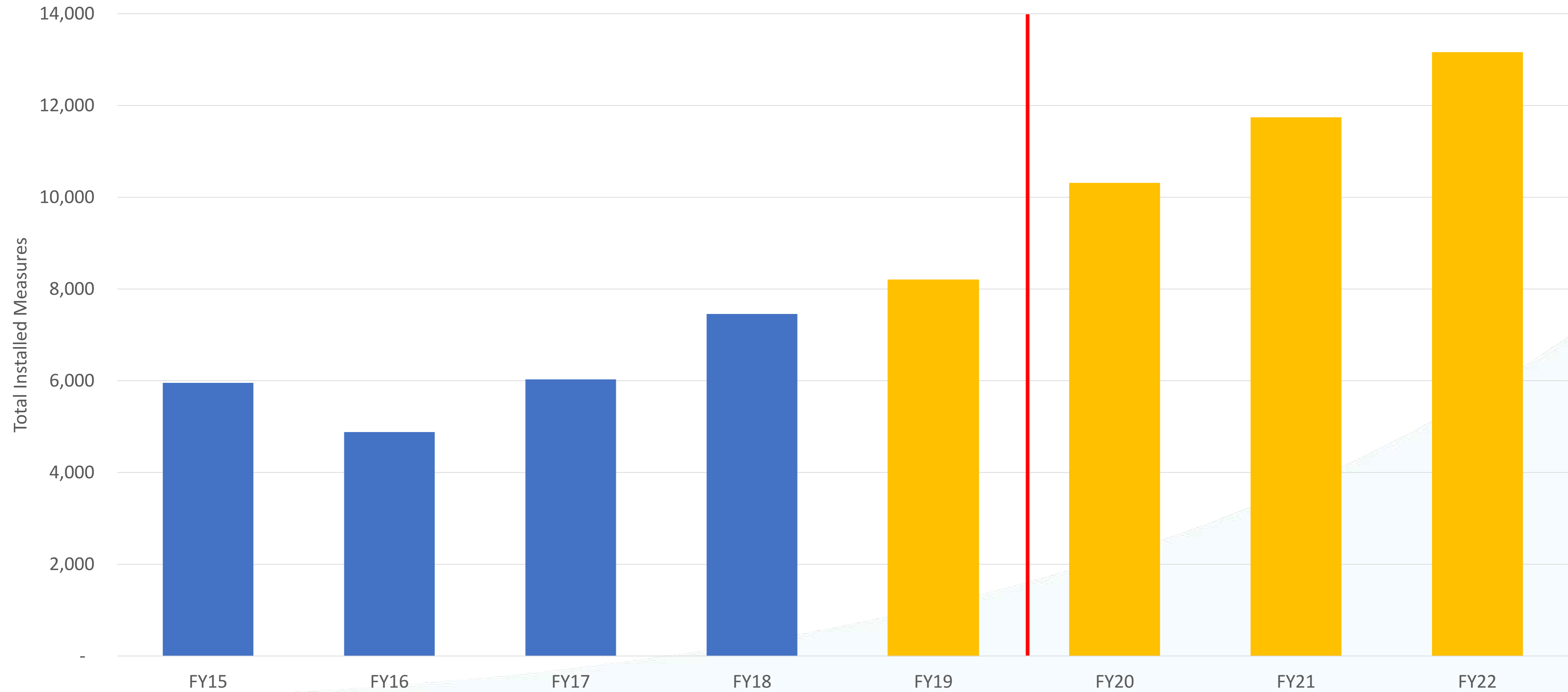


Home Energy Savings Program

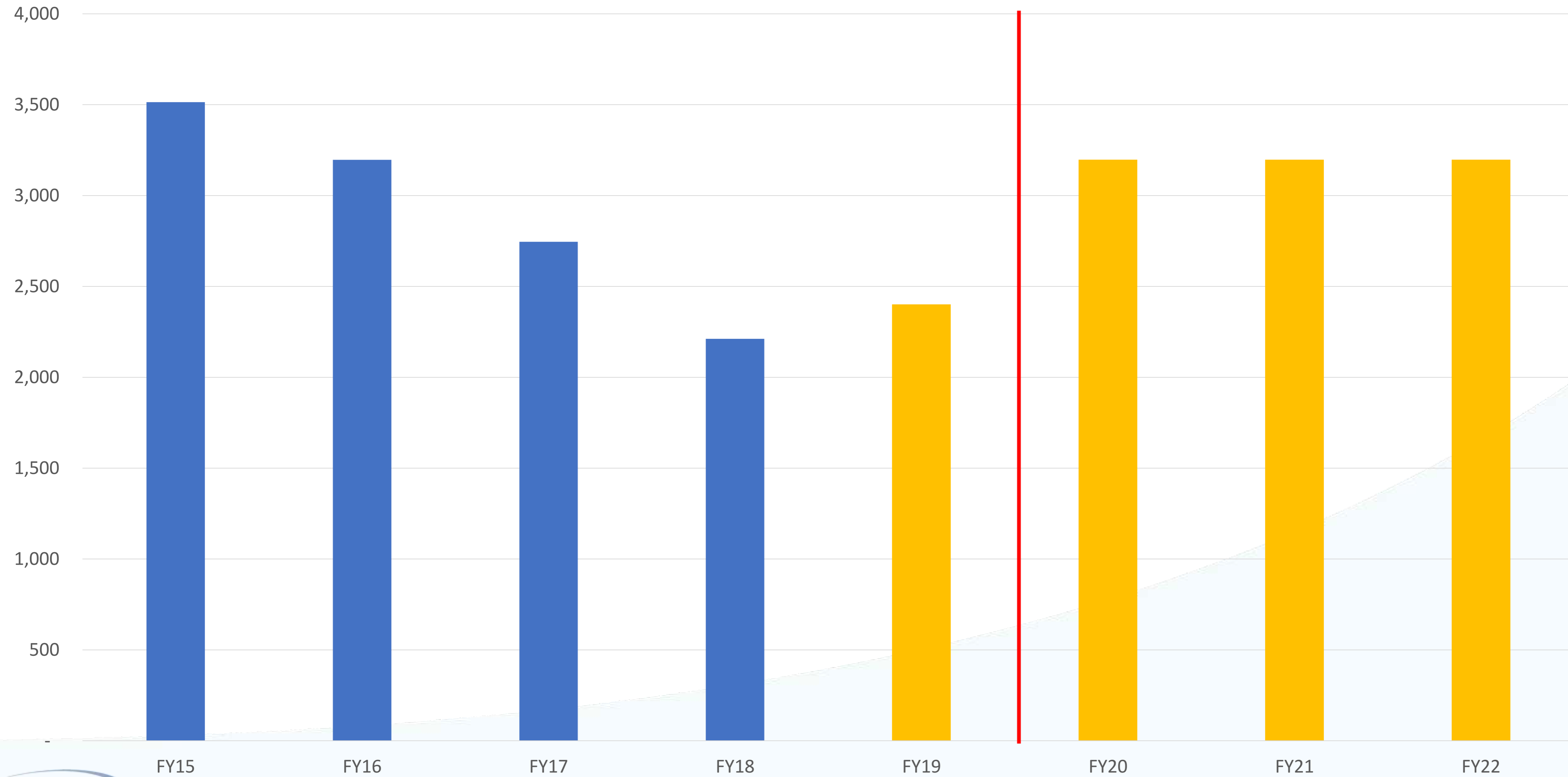
HESP Opportunity

- Weatherization
 - Modest increase reflecting higher oil prices and FY19 incentive levels
- Ultra-Low GHG Heating Systems
 - Status quo
- Ductless Heat Pumps (DHPs)
 - Modest growth based on past program performance
 - Constrained by growth in contractor capacity
 - Expanding education and training programs to improve realization rates
- Furnaces and Boilers moving to Distributor Initiatives
- Wood / pellet stoves moving to Retail Initiatives

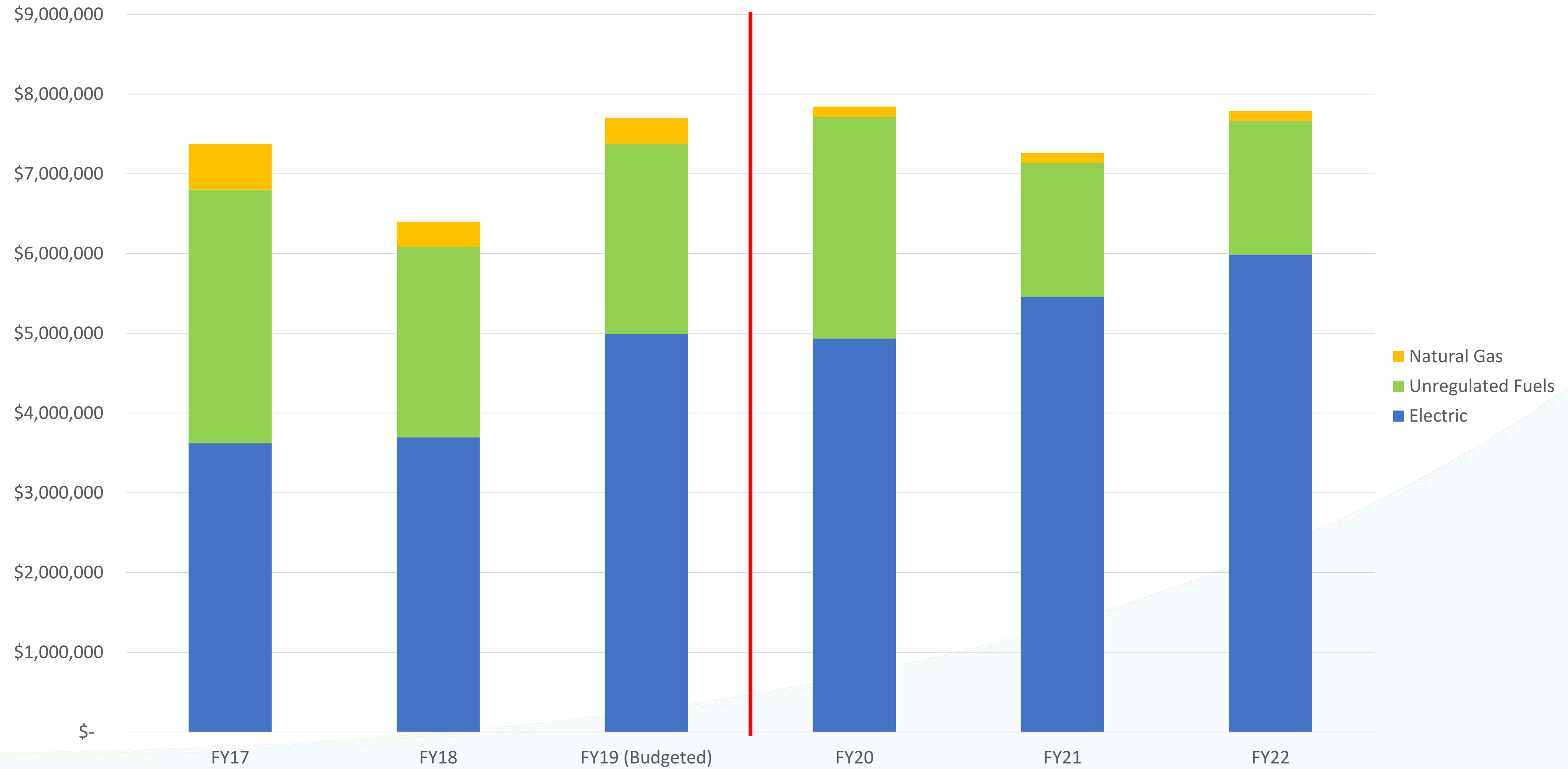
Total Residential DHP Heads



Weatherization Measures Unregulated Fuels



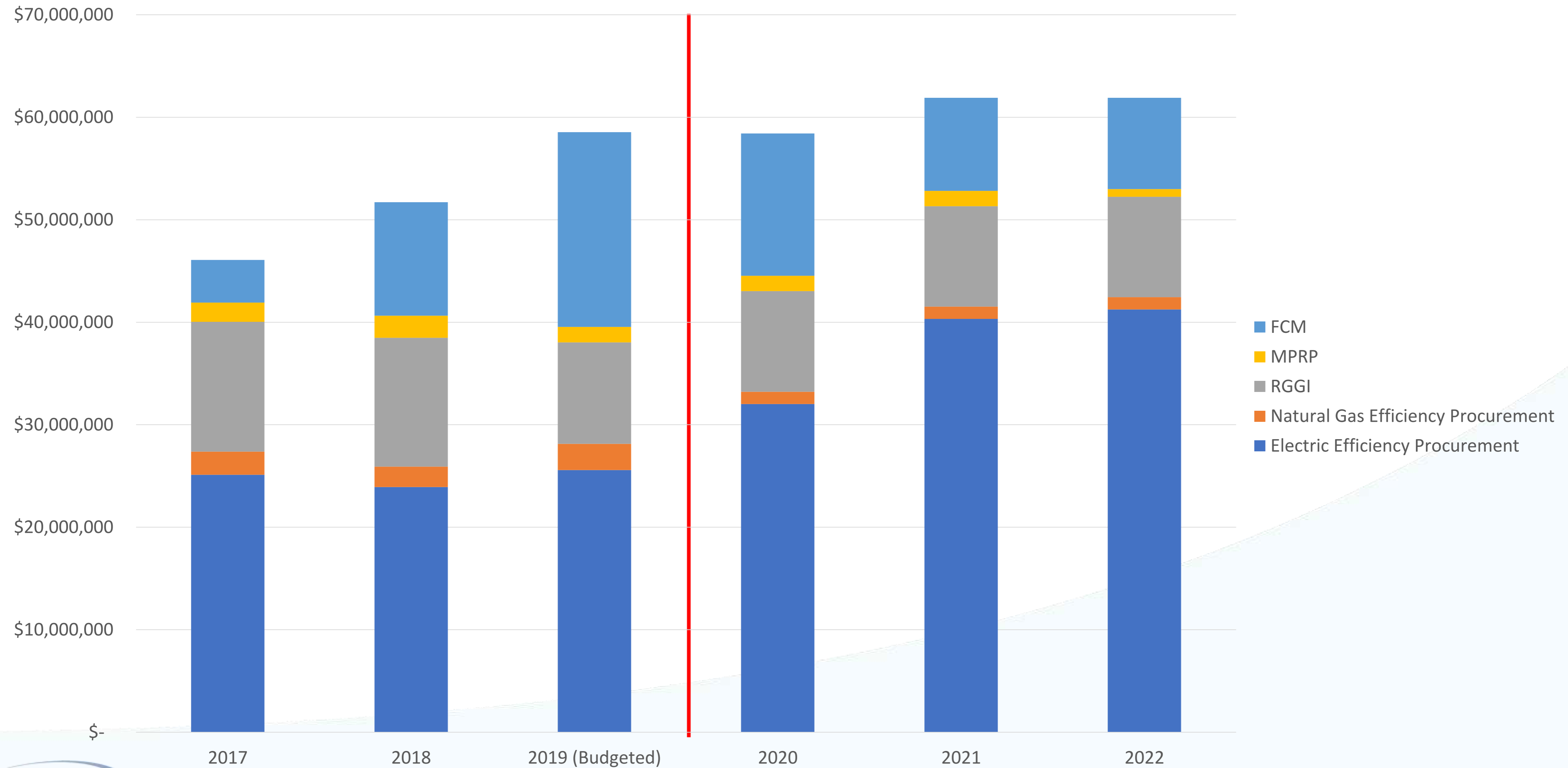
HESP Budget Overview



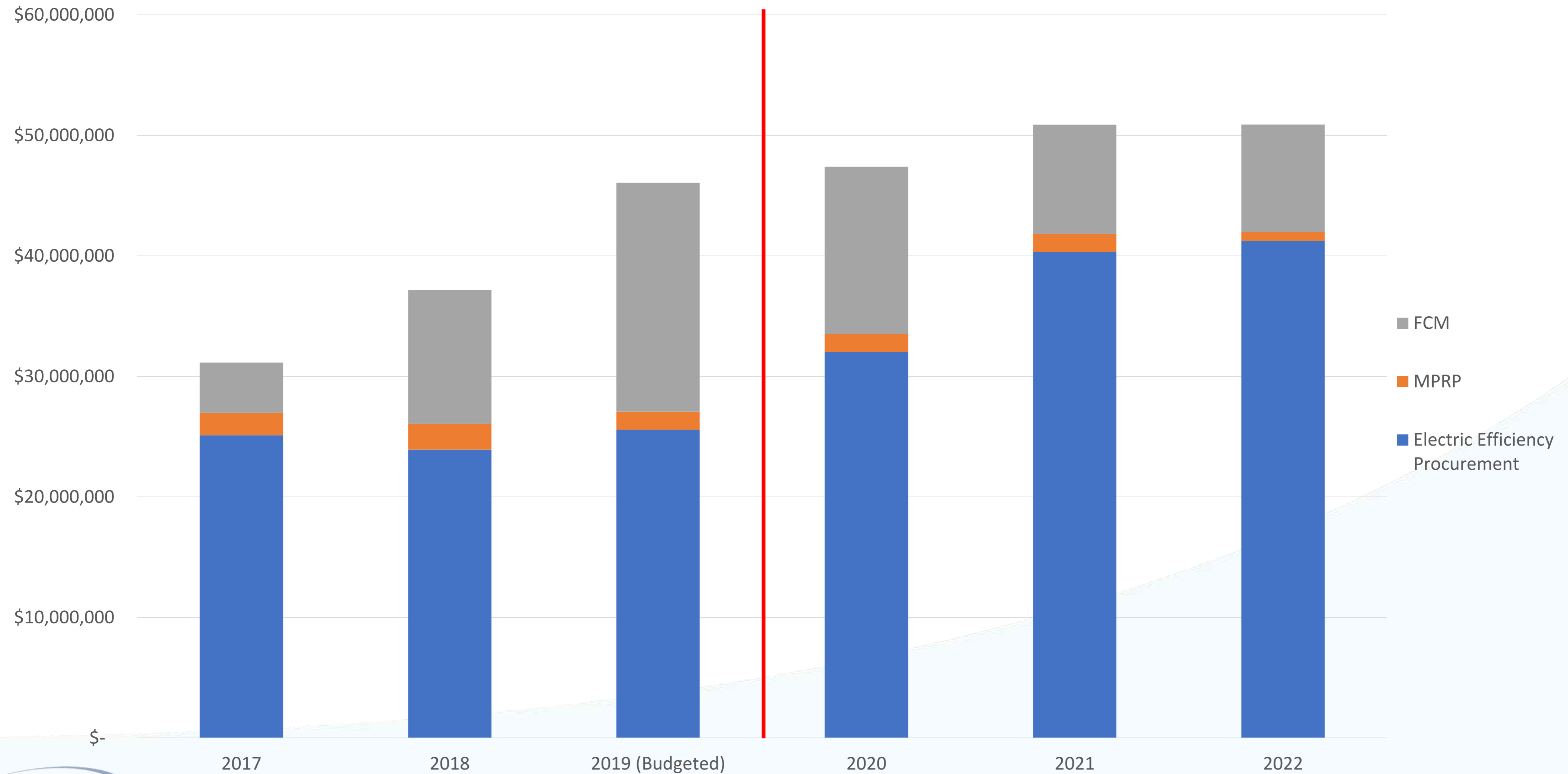


Budget Overview

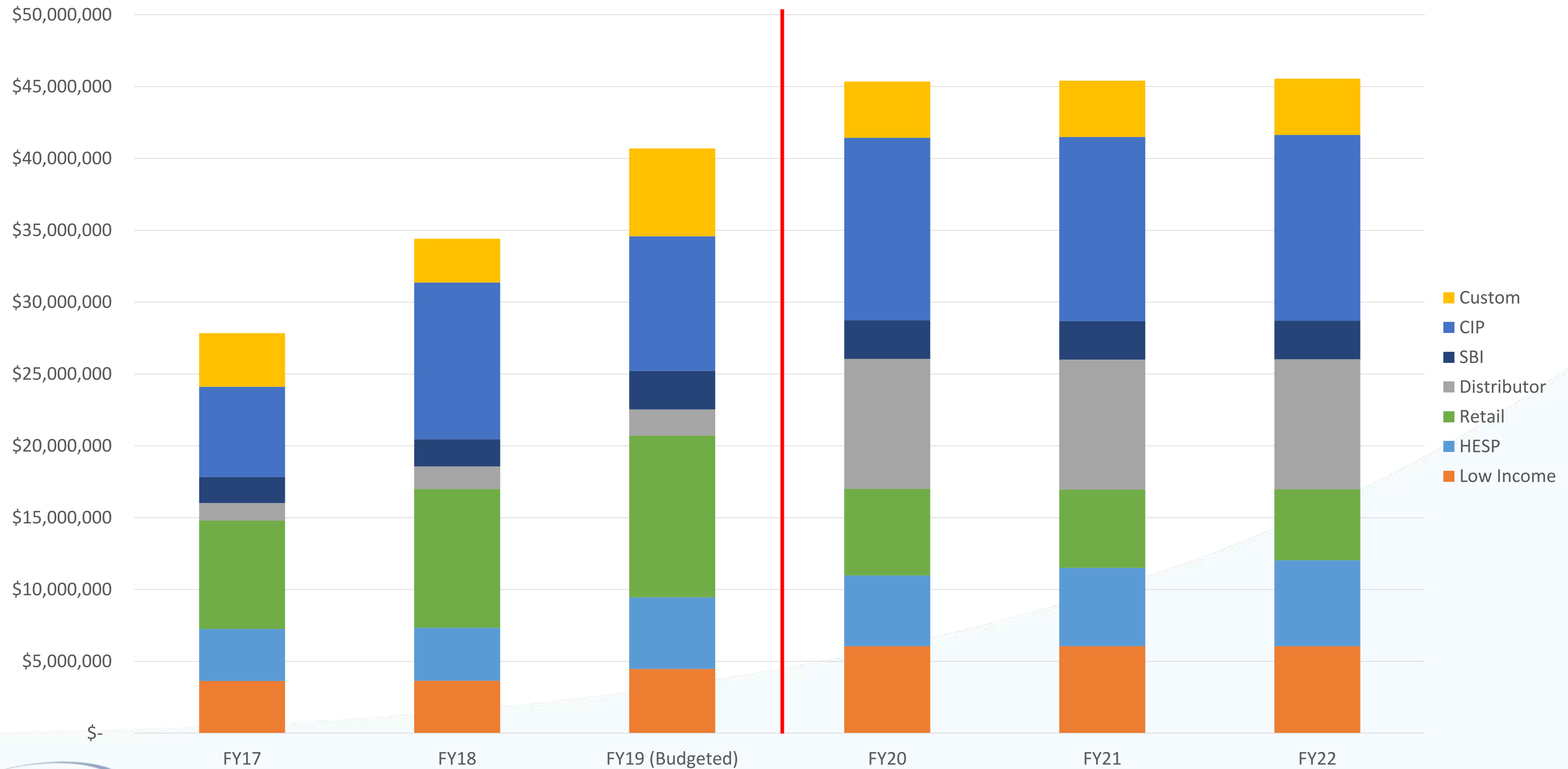
Triennial Plan IV Budget Overview



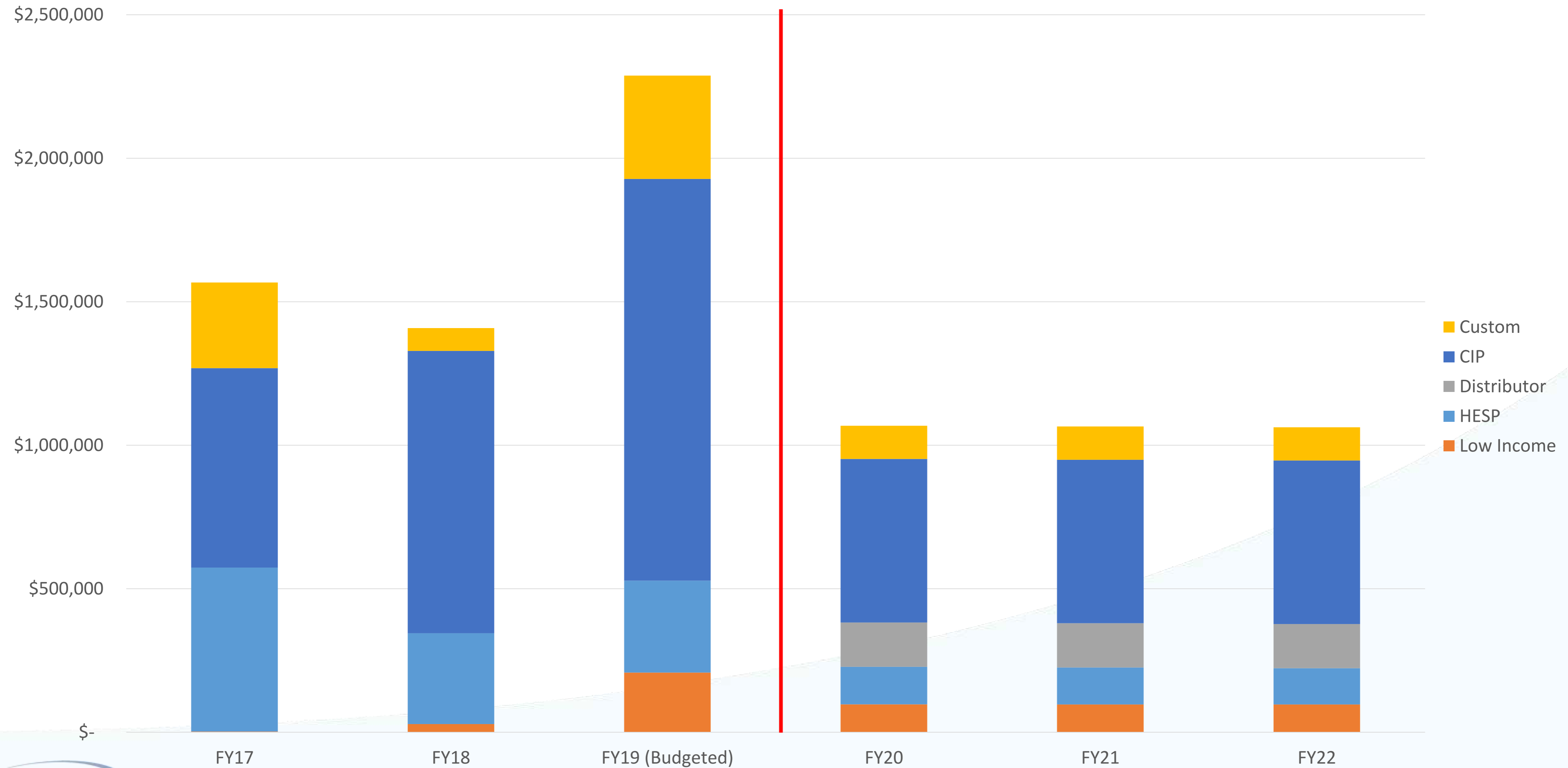
Electric Budget: Expenditures by Fund



Electric Budget: Expenditures by Program



Natural Gas Budget: Expenditures by Program



RGGI Budget: Expenditures by Program

