

# **HVAC Energy Efficiency in California**

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# Challenging Steps Forward: Require Much Closer Partnering

## Integration

- Customer-centric
- Integrated Demand-Side Management (IDSM)
  - Energy Efficiency
  - Peak Demand Control
  - Dynamic Pricing
- Closer utility joint-effort
- Marketing, education & outreach (Engage360.com)
- SmartMeter, SmartGrid
- Whole House/Building

## Tighter Plans, Scrutiny

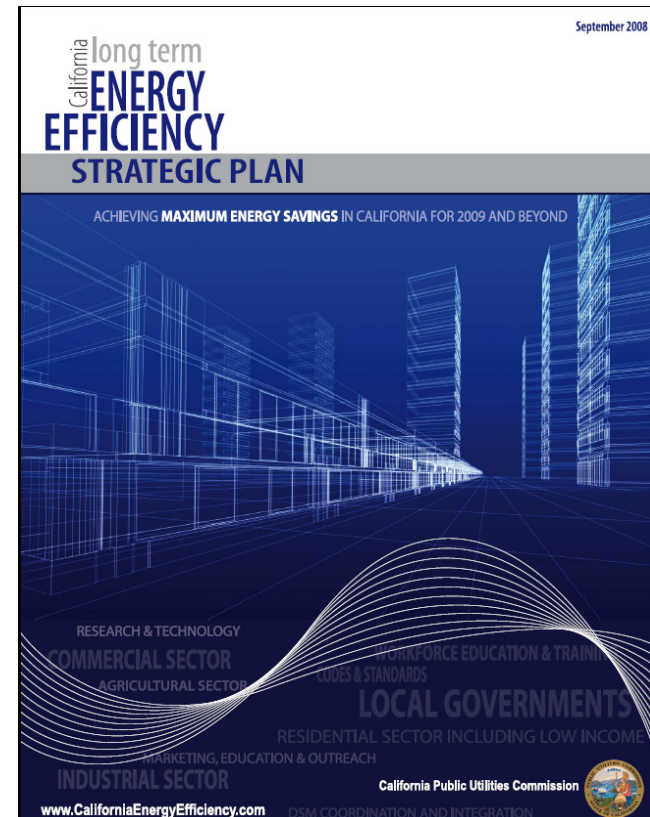
- CA EE Strategic Plan
  - Short-, medium-, long-term
  - Beyond utility programs
- CA Action Plans
- Evaluation, measurement & verification
- Energy savings claims
- Cost-effectiveness targets
- Administrative cost limits
- Gated IDSM Product Development Process

# Great Results Expected





- **Increased customer satisfaction**
- **Closer connection to customers**
- **Better fit with market**
- **New opportunities**
- **Cost-efficiency**
- **Holistic solutions**
- **Better ROI for ratepayer \$**
- **Easier for customers and partners to navigate program offerings**
- **Energy savings beyond low-hanging fruit**
- **More efficient, effective IDSM sales efforts**

# Strategic Plan

*The residential and small commercial HVAC industry will be transformed to ensure that technology, equipment, installation, and maintenance are of the highest quality to promote energy efficiency and peak load reduction in California's climate*



# Strategic Planning Goals - HVAC

Goal	Goal Results
1. Consistent and effective compliance, enforcement and verification of HVAC-related building and appliance standards.	 HVAC-related permits are obtained for 50 percent of installations by 2015 and 90+ percent by 2020.
2. Quality installation and maintenance becomes the industry and market norm.	 By 2020, 100 percent of systems are installed to quality standards and optimally maintained throughout their useful life.
3. Whole building design and construction practices fully integrate building performance objectives to reduce cooling and heating loads.	 Integrated design and construction practices are standard practice by 2020.
4. New climate-appropriate HVAC technologies (equipment and controls, including system diagnostics) are developed with accelerated market penetration.	 At least 15 percent of equipment shipments are optimized for California's climate by 2015 and 70 percent by 2020.

# Overall Program Challenges

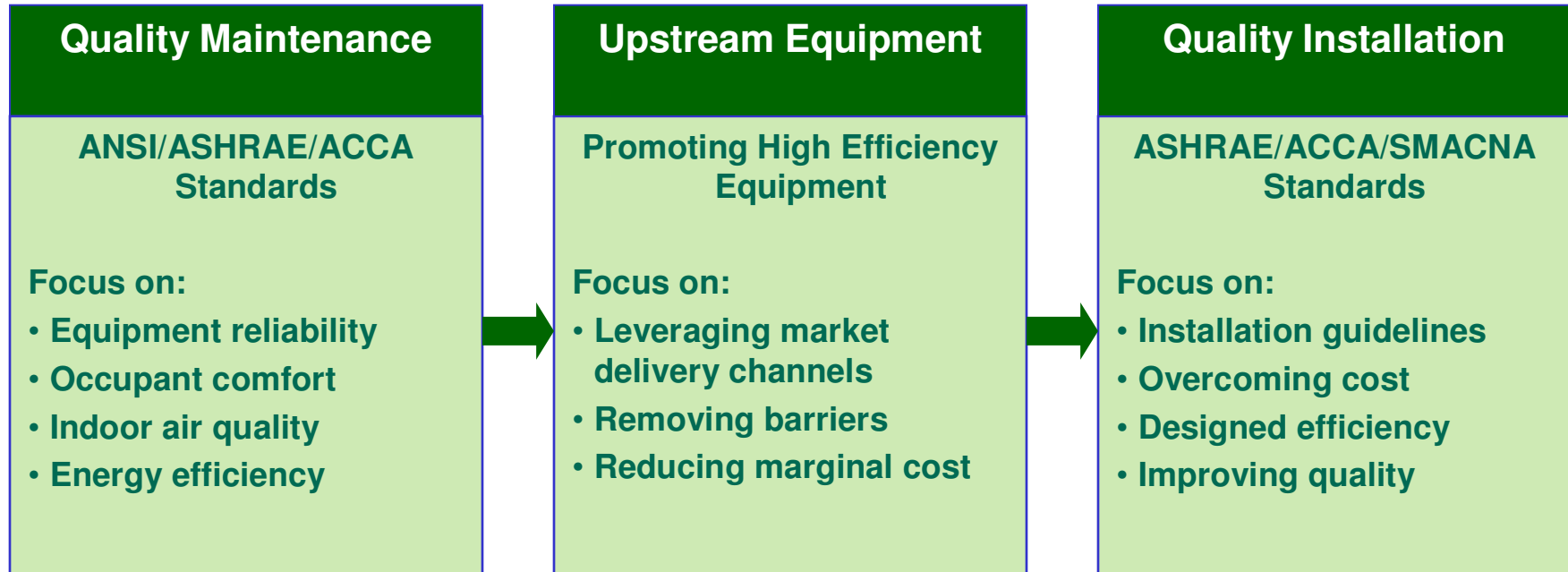
- Codes
  - Increase in minimum standard efficiencies reduce the available savings that can be claimed by program
- Usage
  - Mild climate = low operating hours which further reduces the available savings
- Measures
  - Maintenance measures offered in 2006-2009 have not proven to deliver the anticipated savings
  - Mass market approaches to “tune-ups” have a negative impact on the overall savings
- Equipment
  - The peak efficiency of multi-stage equipment and R-410a is lower at higher ambient temperatures
- Peak vs. Efficiency
  - HVAC is a peak reduction measure, but cost effectiveness is driven by efficiency

# California HVAC Program Strategy

*Comprehensive statewide set of downstream, midstream, and upstream strategies designed to ensure that:*

- HVAC *technology, equipment, installation, and maintenance are of the highest quality*;
- *Quality installation and maintenance practices are easily recognized* and requested by customers;
- The *HVAC value chain is educated* and understands their involvement with energy efficiency and peak load reduction; and
- The above changes lead to *sustained profitability for HVAC trade allies* as the business model for installing and maintaining heating and cooling systems changes from a commodity-based to a value-added service business

# Comprehensive Solutions



The focus is on equipping customers with the right decision making tools when purchasing, installing and maintaining their equipment.

Stakeholders encouraged to engage directly and via Western HVAC Performance Alliance collaboration

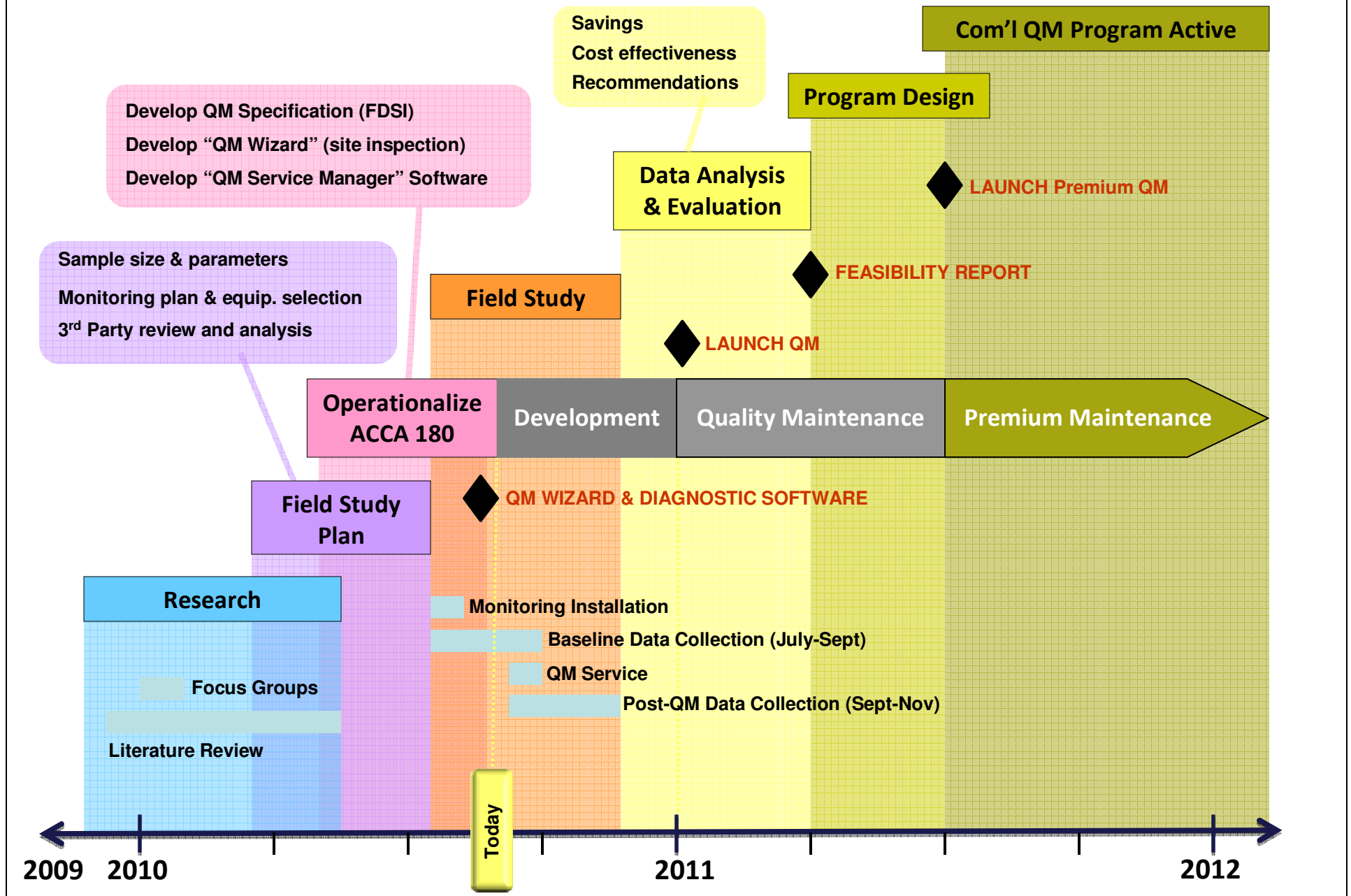
# Appendix

# Quality Maintenance

*A comprehensive, continuously improving O&M activity that captures savings and provides a high ROI to the end-user thus driving the market transformation of the HVAC industry*

- Provide a sustainable tiered performance approach to assess a RTU's efficiency and capacity
- Focus on the impacts of maintenance on occupant thermal comfort, indoor air quality and energy efficiency
- Help the customer overcome the higher cost of operating degraded performance equipment
- Help the contractor overcome the higher cost of performing procedures
- Ensure equipment performance (EER/SEER) is realized

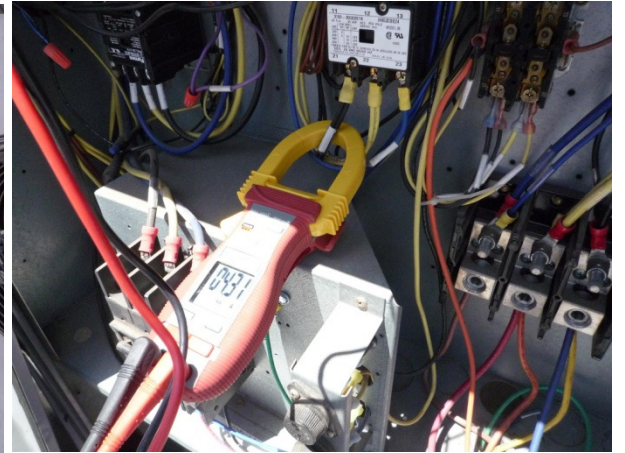
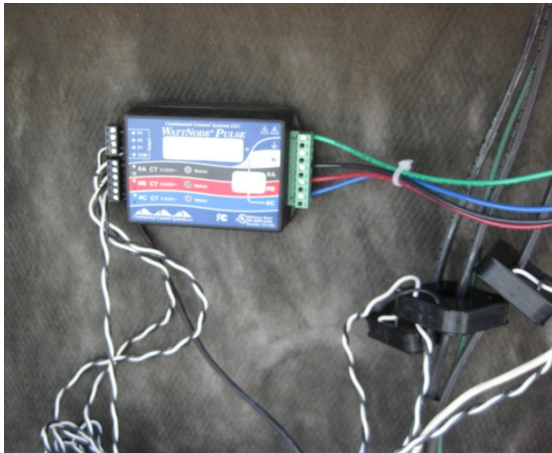
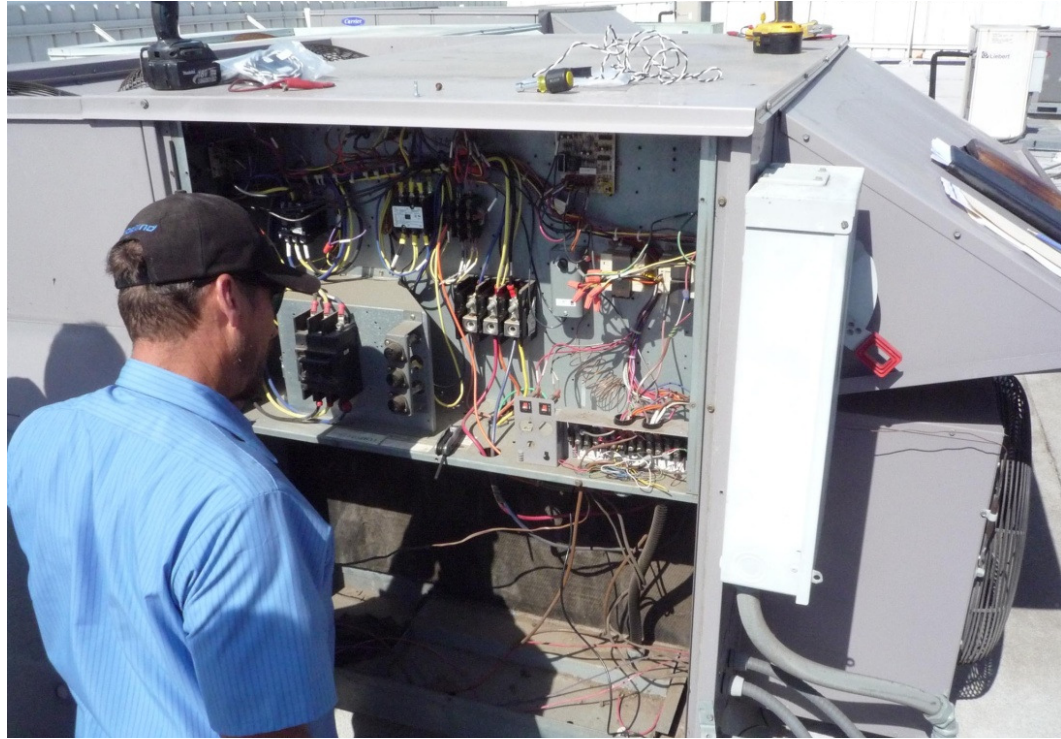
# HVAC QM Program Development



# QM Program Successes

- Comprehensive Field Study Plan completed (7/16)
  - Goals & key tasks
  - Sample set criteria
  - Monitoring parameters and measurement requirements
  - Data analysis approach
  - Monitoring equipment installation guidelines
- 18 Sites engaged (7/23)
  - 6 Retail, 6 Office, 6 Restaurant
- Monitoring equipment installed (7/30)
- QM Software Training
  - Dry run completed (8/17&18)
  - Tech Training (9/13&14)

# Monitoring Installation



# Upstream Equipment

***Financial incentives to manufacturers and distributors who stock and sell qualifying high efficiency HVAC equipment.***

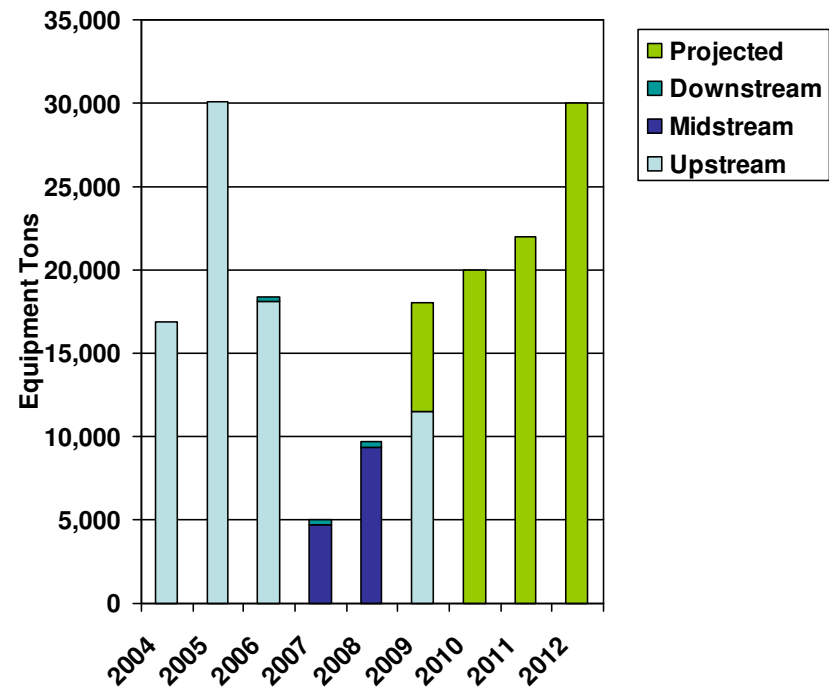
- Increasing marginal value to SCE customers by inducing incentives at the first stage of distribution to reduce marginal costing thereby changing the total cost of high efficiency equipment
- Educating and promoting contractor communications to customers on the benefits of high efficiency equipment
- Leveraging the market place by creating a demand for the purchase of bulk quantity of high efficiency units
- Removing the barriers associated with availability, competitive bids, quantity, stock planning and space requirement
- Online rebate processing that reduces paper waste and administrative handling cost

# Program Challenges

- Customer expectations
- Tracking equipment installations
- Ensuring that quality installations occur

# Program Successes

- Achieve more results working through upstream channels
- Capture results from emergency replacement
- Use distribution chain margins to increase the value of the incentive



# Quality Installation

*Financial incentives to contractors who design and install in accordance with the appropriate industry standards (e.g. ACCA, SMACNA and ASHRAE)*

- Highlight importance of using minimum standards and encourage their use to size, select, install and commission new and replacement equipment
- Raise the quality level of contractors by setting minimum performance standards
- Demonstrate the value to consumers of a properly designed and installed system
- Demonstrate the value to contractors of a sustainable business model based on quality
- Support the industry's development of higher levels of standards

# Program Challenges

- Attribution of energy savings due to QI
- Contractors resistance to QI standards
- Providing adequate contractor support
- Demonstrating value of QI to customer

# California HVAC Program Strategy Recap

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