

# IMPACT EVALUATION OF RESIDENTIAL HVAC MEASURES

Residential Sector Program  
Year 2020



## BACKGROUND

DNV evaluated four technologies offered through efficiency programs meant to reduce the amount of energy used in residential heating, ventilation, and air conditioning (HVAC) systems.



Smart  
Thermostats



Duct testing  
and sealing



Fan motor  
replacements



Fan  
controls



## APPROACH & OBJECTIVES



DNV used consumption data analysis and surveys to evaluate electric and gas savings among participants across various dwelling types, locations, and energy consumption profiles, and quantified the extent to which the efficiency programs influenced these savings.

## KEY FINDINGS



PROGRAM  
INFLUENCE

78 to 90% of direct install savings and 47% of rebate savings would not have occurred without program interventions.



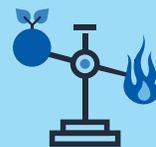
PROGRAM  
SAVINGS

Direct install and rebate programs achieved net electric of 3.1 GWh and gas savings of 141,681 therms statewide.



SAVINGS  
SHAPE

Energy efficiency measures like **fan motors** and **duct sealing** can reliably reduce consumption proportionally to HVAC consumption.



"HEAT OR EAT"  
DILEMMA

Up to **one-third** of all customers reported forgoing basic necessities to pay their energy bills since the onset of COVID-19.



DEMAND  
RESPONSE

Over **one-half** of all customers expressed some level of interest in participating in DR programs.



**STRENGTHS**

Study design controls for program exogenous changes and established methods are used to determine program influence.



**LIMITATIONS**

While engineering models used to allocate savings to measures are anchored in customer consumption profiles and the 2019 CA RASS study, some uncertainty remains in the allocations.

**RECOMMENDATIONS**



**PROGRAM INFLUENCE**



**PROGRAM SAVINGS**



**SAVINGS SHAPE**



**“HEAT OR EAT” DILEMMA**



**DEMAND RESPONSE**

**IMPLICATIONS**

Program influence and expected savings—Continue to adjust ex-ante values for program influence and expected savings for measures in line with stable savings patterns from past evaluations.

Program administrators should continue to include measures like fan motors and duct sealing that deliver savings consistently across all seasons in the residential HVAC program portfolio.

Direct install programs should maintain targeting and outreach strategy that seem to be reaching the right demographic customer segments.

Program administrators should include information on the benefits of DR program participation for customers that receive free or subsidized smart thermostats through EE programs and implement an option to enroll willing customers at the point of installation, given the level of interest indicated by customers.

**STUDY SPONSOR:**

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