Air Conditioning Contractors of America
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Ms. Maddie Koewler
National Association of State Energy Officials
1300 North 17th Street, Suite 1275
Arlington, Virginia 22209

RE: NASEO RFI on Implementation Options for HOMES and HEEHR

Dear NASEO Members:

I write today on behalf of the Air Conditioning Contractors of America (ACCA), the leading national association representing heating, ventilation, air conditioning, and refrigeration (HVAC-R) contractors. Our over 3,000 member companies are recognized as industry leaders and are responsible for $88 billion in annual sales.

ACCA also strives to ensure consumers get the comfort and efficiency they expect by developing and promoting ANSI-recognized quality standards, including the ANSI/ACCA 5 Quality Installation standard. ACCA is an EPA recognized HVAC Quality Installation Training and Oversight Organization ("H-QUITO") supporting implementation of the ENERGY STAR Certified Homes program. Over 800 contractors currently participate in ACCA's Quality Assured contractor accreditation, which also supports the ENERGY STAR Verified HVAC Installation (ESVI) program.

Proposed Program Element
ACCA Quality Installation Certificates: An Essential Requirement for Delivering the Realized Efficiency that Consumers and the States Expect

Overview
In recent years, efficiency programs and consumers have spent hundreds of billions chasing modest improvements in the nameplate efficiencies of HVAC systems, but Quality Installation has often been the missing leg of the stool. A 2014 NIST study found that about half of HVAC systems have significant installation faults, costing as much as 40 of their design efficiency. As companies hire thousands of inexperienced installers and stockpile any available equipment to meet demand driven by the Inflation Reduction Act, there's a very real risk that consumers will be left with systems that *raise* their energy bills while making their homes *less* comfortable – a worst case scenario.

The challenge is that Quality Installation has always been difficult to verify and incentivize at scale – until now! This year ACCA re-launched its Quality Installation (QI) certificates with verification using smart diagnostic tools through the measureQuick® app, which integrates with leading field service software and program implementors like ICF. Requiring a Quality Installation (QI) certificate for HVAC improvements under the HEEHR and HOMES programs

can help save consumers from a heat pump assembly line. Instead, they'll get a quality contractor who will do a proper system design, pair them with appropriate technology, and verify the performance of their entire system.

Quality Installation: Missing Leg of the Stool

The National Institute of Standards and Technology (NIST) released a study in 2014 that examined the energy penalties in residential HVAC units.[1] NIST found that duct leakage is the most significant fault, accounting for a 30 percent energy penalty. Additionally, equipment oversizing and refrigerant undercharge can each decrease efficiencies by 20 percent. If there are multiple faults in a residential HVAC system, then the annual increased energy consumption can be more than 40 percent.

The HVAC systems our members install, service and repair are the largest consumer of energy in America. U.S. homes consume about l0.18 quadrillion BTUs, and residential HVAC systems account for nearly 48 percent of total energy consumption in U.S. households.[2] A 30 percent energy loss in HVAC systems for failing to observe ACCA installation, duct work, or home performance procedures wastes about 1.5 Quads, or 439,606,625,000 kilowatt hours (kWh). With 124.6 million households in the U.S., and an average energy cost of 13 cents per kWh, each household wastes about 3,500 kWh ($458 per year).

Quality Installation is the low hanging fruit to achieve our efficiency goals. The HEEHR and HOMES programs provide unique opportunities to drive broader recognition and adoption.

New Technology Can Verify Quality Installation at Scale

Contractors' growing adoption of smart diagnostic tools makes it both easier and more reliable to verify that a system is operating to manufacturer specifications. In fact, over 16,000 technicians use the measureQuick® app daily and it has been used to support efficiency programs like Mass Save in Massachusetts.

Installation techs use digital probes, paired with the measureQuick® app, to analyze equipment and system performance data to determine eligibility for the ACCA QI Verified Equipment Operation (VEO) or Verified System Performance (VSP) certificate. The technician follows an easy-to-follow diagnostic process to improve and verify equipment and system performance until it qualifies for the desired certificate.

A Verified Equipment Operation (VEO) certificate is earned when a new HVAC installation meets high standards in areas including:

- Airflow
- Refrigerant charge (for air conditioners and heat pumps)
- On-rate combustion (for furnaces and boilers)
- Electrical

The Verified System Performance (VSP) certificate takes things a step further. The entire HVAC system is considered, including everything required for VEO certification plus:

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[1] https://www.acca.org/viewdocument/sensitivity-analysis-of-installation-faults-on-heat-pump-performance

[2] https://www.eia.gov/consumption/residential/data/

- Ventilation
- Manual J load calculation
- Manual S equipment selection
- AHRI matched system
- Tight ductwork
- Balanced airflow

A VSP certified system that uses qualifying ENERGY STAR equipment may also earn an ENERGY STAR Verified HVAC Installation (ESVI) certificate. Learn more about this program and certificate options at: www.acca.org/qa/prove-it.

The measureQuick® app, already boasts an unparalleled ecosystem of diagnostic tools, monitoring devices, HVAC contractors, and software providers and is continually adding new integrations. ACCA is also open to exploring additional certificate pathways outside measureQuick®.

Prioritizing Comprehensive System Upgrades in HEEHR

The generosity of heat pump rebates under the High-Efficiency Electric Home Rebate Program (HEEHR) program is sure to attract unqualified operators focused on swapping furnaces for free heat pumps and nothing else. That would be a shame since a heat pump oversized to heat or cool today's poorly sealed and insulated home is unlikely to swapped out when other improvements are made later. In addition, the likelihood of installation faults is greatly increased when there is no verification. Quality contractors are less likely to squander this opportunity to weave together various utility rebates and federal tax credits to offer more comprehensive system upgrades for pennies on the dollar.

System-level planning will be further encouraged by offering the largest rebates only for systems that qualify for the ACCA QI Verified System Performance (VSP) or ENERGY STAR Verified HVAC Installation (ESVI) certificate. VSP could also be used as a qualification to access additional state or utility programs.

States should consider making at least an ACCA QI Verified Equipment Operation (VEO) certificate a requirement for any HVAC-related rebate under the HEEHR. A third-party certification that the system is operating to manufacturer specifications is an inexpensive quality control measure that ought to keep bad actors away and better prioritize limited rebate funds.

Adding Rigor to Modeled Energy Savings Under the HOMES Program

Even though energy modeling software has improved in recent years, none that we're aware of actually uses smart connected tools to verify that installed HVAC equipment is operating to manufacturers specifications. A potential 40% reduction in realized efficiency from HVAC installation faults could dramatically reduce a home's overall efficiency.

To ensure that HOMES rebates deliver the realized efficiency that matches the modeled efficiency improvements that these rebates are paying for, it seems prudent to require that homeowners submit at least an ACCA QI Verified Equipment Operation (VEO) certificate.

If the energy modeling software used does not verify HVAC system design, duct sealing, ventilation, and balancing, itis advisable to go a step further and require an ACCA QI Verified System Performance Certificate (VSP).

While less essential in the case of the HOMES Program's measured efficiency track, encouraging issuance of ACCA QI certificates could still serve to enhance consumer confidence and broaden recognition of HVACR efficiency investments in the real estate market.

Additional Comments
The successful adoption of quality installation practices and smart connected tools throughout the HVACR industry will require a significant investment in training for contractors and their teams. Contractor Training Grants under the Inflation Reduction Act should focus on enhancing these stills through contractors' in-house training programs and existing apprenticeship programs.

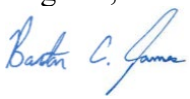
Working through our network of state and local Allied Contracting Organizations ACCA offers a variety of in-person, live virtual, and on-demand courses on topics like residential system design, home evaluation and performance improvement, duct diagnostic and repairs, smart connected tools, and A2L refrigerant safety. We would be glad to partner with state energy offices to integrate these resources into your training vision and ensure that you're connected with rather than competing against well-established training programs.

Thank you for the opportunity to offer ACCA's QI certificates as an essential program element in implementing these exciting programs. For additional details, please contact Wes Davis, Director of Technical Services, at 703-824-8847 or wes.davis@acca.org.

ACCA is committed to fostering, cultivating and preserving a culture of diversity, equity and inclusion. Thanks to public records made available through the Paycheck Protection Program (PPP) we now know that over 6,000 HVAC companies are minority owned, over 4,000 are woman owned, and over 2,000 are veteran owned. ACCA members have learned that attracting diverse talent can result in more innovative thinking in an organization and more investment in the company by its workers. In recent years we have supported member efforts to adopt policies and practices to cultivate and preserve a culture of diversity, inclusion and belonging makes their companies stronger, and directly aligns with our mission to help all people get jobs in the trades.

Air Conditioning Contractors of America authorizes NASEO to publish and distribute this response to the NASEO RFI on its website and through other means to the states and general public. We have included no confidential or proprietary information in our response.

Regards,



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