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Additional submitted attachment is included below.

ESCO Institute

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ESCO Institute's Response to California Energy Commission's RFI on Inflation Reduction Act Contractor Training Program

Docket 23-DECARB-01

Submitted September 12, 2023

On behalf of the HVACR education community, the ESCO Institute submits the following comments in response to the California Energy Commission's (CEC) Request for Information for August 2023 regarding Contractor Training related to the Inflation Reduction Act Residential Energy Rebate Programs.

In pursuit of California's ambitious decarbonization goals, it is evident that a comprehensive strategy for educating HVAC educators, technicians, and contractors in the installation and servicing of high-efficiency cold climate heat pumps is essential.

[ESCO Institute](#), along with its divisions [HVAC Excellence](#) and the [Green Mechanical Council](#), specializes in developing standards, validation tools, and training resources dedicated to the HVACR and building science sectors. Additionally, [ESCO Doc Registry](#) provides California an acceptance testing registry for compliance with Title 24 Part 6 Non-Residential Mechanical Acceptance Testing.

Our dedicated teams of subject matter experts (SMEs) span across all segments of the industry, allowing us to create tailored curricula for educational institutions, distributors, and contractors. Collectively, we possess the expertise and resources necessary to ensure that your training initiatives, or those you support, remain current and relevant in an ever-evolving industry landscape.

The integration of training across all levels of the industry, focusing on the latest manufacturer-developed systems, is of paramount importance. There is an evident need for training materials and certifications that substantiate the technological advantages of these systems. Historically, a lack of funding for the educational infrastructure has resulted in a shortage of adequately trained technicians, thereby limiting the available talent pool for contractors.

In conclusion, ESCO is committed to supporting the development of comprehensive training programs aimed at equipping HVAC educators, technicians, and contractors with the skills and knowledge required to meet California's decarbonization goals. We stand ready to collaborate with the CEC and other stakeholders to bridge the gap in training materials, certifications, and funding to ensure the availability of highly skilled HVACR professionals.

1. Please provide information on available state and federal residential energy contractor training and similar programs in California, including a list of organizations currently providing training, credentialing, and/or wrap around services. Please include references on:

- a. Residential (single-family and multifamily) and commercial energy auditor availability and readiness;
- b. Available skills assessment reports for existing education and training programs, such as on new energy technologies, latest best practices, or newly launching programs.

In collaboration with the Federal government, ESCO has played a pivotal role in the development of an [Energy Auditor Training Program](#). This program, which received funding from the Department of the Interior, comprises an extensive 800-contact hour curriculum package. Designed with modularity in mind, it empowers instructors to either

implement the entire curriculum or selectively integrate specific subject modules to enhance their existing HVACR programs.

ESCO's strong affiliations with both Federal and state agencies have enabled us to remain at the forefront of industry advancements, facilitating rapid content development to keep pace with evolving technologies. Nonetheless, notable gaps currently persist within the realm of education. Specifically, there is a notable deficiency in comprehensive cold climate heat pump courses, qualified educators, specialized testing equipment, and the necessary classroom infrastructure for practical training.

To address these deficiencies and bolster the educational pipeline, we propose leveraging IRA funding to support organizations dedicated to the development of instructor training programs, that lead to training and certification for the current and incumbent workforce. This strategic investment will not only bridge existing gaps but also ensure a skilled and knowledgeable workforce prepared for the demands of our evolving energy landscape.

In a pivotal move that aims to empower students and revolutionize the HVACR industry, the United Association of Journeymen and Apprentices and HVAC Excellence have joined forces to establish a groundbreaking [articulation agreement](#). Under this pioneering articulation agreement, the hard-earned credits and credentials of students who have completed HVAC Excellence accredited programs can be recognized and smoothly transferred into the esteemed UA apprenticeship program. An articulation agreement, at its core, acts as a formal bridge between two educational institutions or organizations, offering a clear pathway for students to transfer their academic achievements from one entity to another. The benefits of such forward-looking articulation agreements are manifold. Students' painstakingly earned credits and credentials are acknowledged, enabling them to avoid course repetition and potentially

achieve advanced placement with the [Mechanical Service Contractors of America](#) (MSCA) employer partners.

Eugene Silberstein, National Programs Director at HVAC Excellence, a division of ESCO Group, sits on the Boards of the [Institute of Heating and Air Conditioning Industries](#), Inc. (IHACI) and [Electric and Gas Industry Association](#) (EGIA) helping to direct and coordinate California HVACR training.

ESCO, in collaboration with key stakeholders from the Department of Energy, the Environmental Protection Agency, and leading manufacturers, plays a pivotal role in organizing the National HVACR Education Conference. This conference serves as a crucial platform for educators at the forefront of the industry to directly engage with influential figures who are actively shaping regulations, standards, and technological advancements.

Through these strategic partnerships and engagements, ESCO remains at the forefront of the HVACR industry, gaining timely insights into the latest developments. These insights are swiftly transformed into educational curricula and materials that cater to the diverse learning needs of industry professionals. ESCO's commitment to knowledge dissemination extends across various mediums, including print, video, interactive simulations, in-person workshops, and online training programs. This multifaceted approach ensures that the industry's workforce remains well-equipped and up-to-date with the evolving landscape of HVACR technologies and practices.

At every stage of an individual's career within the HVACR industry, spanning from their time as a student, technician, contractor, or instructor, they engage in a progressive and "stackable" certification process. This process serves as a crucial validation mechanism, allowing individuals to assess their retained knowledge and identify areas in need of further training. Unlike organizations that exclusively focus on specific segments of the industry such as students, instructors, or technicians, ESCO distinguishes itself by

offering a comprehensive range of portable and stackable credentials that cater to all career levels and developmental stages within HVACR.

Through this distinctive and highly regarded perspective, ESCO is uniquely positioned to monitor the growth and achievements of individuals as they advance in their HVACR careers. Leveraging our extensive longitudinal data, we have the capacity to design specialized training programs specifically targeting identified skill gaps and deficiencies.

ESCO also extends support to instructors by providing them with access to our comprehensive [competency and task list](#). This resource meticulously outlines and organizes the fundamental knowledge areas and skills that should be integrated into each subject matter within an HVACR program. While the core competency and task list encompass the essential components applicable to most HVACR educational programs, the specific curriculum of each institution may necessitate the addition of further competencies. It's worth noting that this valuable resource is offered free of charge and has been recently updated with input from esteemed partners such as the Pacific Northwest National Laboratory (PNNL) and the Department of Energy (DOE), encompassing critical topics like Cold Climate Heat Pumps (CCHP) and Hot Water Heat Pumps (HWHP). These assessments consistently reflect the latest industry best practices, ensuring that instructors have access to cutting-edge educational materials.

2. [If IRA Contractor Training funds are used to supplement existing workforce development programs in California, which programs are most closely aligned with the goals of the IRA Contractor Training Program?](#)

The IRA funding will be strategically channeled to align with the IRA Goal of Contractor Training, primarily by providing essential support for equipment and training within the established California technical school system. This support, when adequately funded, will have a cascading effect by bolstering instructor education, enhancing classroom equipment, and facilitating coaching across all facets of the industry. The [ultimate aim](#) is

to elevate the technical proficiency of HVAC systems, contributing significantly to the reduction of greenhouse gases and the advancement of decarbonization efforts.

Central to this endeavor is the utilization of best practices, contemporary curriculum, and testing methodologies, all meticulously developed by subject matter experts (SMEs) deeply ingrained within organizations that form an integral part of the HVAC industry. ESCO, has pioneered a Heat Pump Course Extension and Certification program, harnessing the expertise of both our SMEs and technical experts from manufacturers. This comprehensive course encompasses the requisite training needed to equip individuals from diverse backgrounds with the essential knowledge and skills to actively participate in carbon reduction efforts.

Grounded in the DOE requirements for Cold Climate Heat Pumps (CCHPs) and Hot Water Heat Pumps (HWHPs), the ESCO Course and Testing initiative offers the educational foundation that California's educators can seamlessly integrate into their curricula. This, in turn, empowers home energy professionals to demonstrate their comprehensive knowledge, skills, and abilities by earning certifications [recognized](#) by the Department of Energy, thus contributing significantly to the industry's decarbonization objectives.

3. What gaps in existing workforce development programs in California can be addressed through the IRA Contractor Training Program? What is the current supply of qualified skilled energy efficiency workers compared to the projected future demand?

The HVACR industry, encompassing installers, service technicians, and professionals, comprises approximately 390,000 individuals nationwide, with California employing approximately 8.5% of this workforce, accounting for roughly 33,000 individuals. As the existing workforce ages and advances in their careers, there is an increasingly urgent need for replacements. Moreover, with a projected industry growth rate of 13% from 2018 to 2028, there is a substantial demand for a new generation of skilled workers.

To address these evolving needs, it is imperative that individuals entering the HVACR industry receive comprehensive training to proficiently install, service, and maintain the next generation of systems. The integration of the latest technologies into existing training programs is essential and should be delivered through qualified, accredited programs that are equipped with up-to-date equipment and staff trained in handling these new systems.

The IRA Contractor Training Program funds are well-suited to bridge these gaps. Financial support for HVACR education community members to attend and receive training at industry conferences like the [National HVACR Education Conference](#), and [AHR Expo](#) is crucial. These conferences provide a direct line to the latest information from manufacturers, keeping educators informed about cutting-edge developments. Additionally, conferences facilitate valuable discussions among educators, allowing them to share insights and improve their teaching methods, thereby expanding their impact on contractors in need of training.

Recruitment efforts should be collaborative endeavors involving educators and contractors. It is vital to promote educational programs to showcase the industry's need for a highly trained workforce. Funding for advertising and promotional activities targeting school guidance counselors is necessary to increase awareness and interest among potential candidates. This funding should ideally be allocated at the state level to enhance the availability of a skilled pool of individuals eager to enter the HVACR industry.

4. [What certifications should be funded through contractor training for residential energy rebate programs in California to support the purpose of this funding and lead to good-quality jobs? As stated in the guidance from the U.S. Department of Energy on this topic: good-quality jobs are jobs that pay sustaining wages with wage progression,](#)

benefits, access to paid leave, opportunities for career advancement through training and education, adequate staffing, safety and health protections, nondiscriminatory and harassment-free workplaces that promote Diversity, Equity, Inclusion, and Accessibility (DEIA) and, to the strongest extent possible, a platform for worker voice that supports all workers and ensures fair pay and safe working conditions.

The United States Department of Energy has gone through a painstaking process of reviewing nationally recognized certifications for [recognition](#). These organizations listed, HVAC Excellence, NATE and SMART all have developed comprehensive programs, covering installation and service of heat pumps, that are recognized by the HVACR industry, and Department of Energy.

HVAC Excellence certifications allow those who proctor the exams to access a variety of [reports](#). These reports provide the proctor with test scores, areas of strength and weakness, a breakdown of the competencies covered in the examination, and statistical data to validate if any identified deficiencies track to a specific student, group of students or a specific content area in the curriculum. Additionally, these reports aid the program in documentation for Perkins compliance for the United States Department of Education.

HVACR contractors engaged in hands-on work in the field must adhere to stringent certification and licensing requirements in California. However, it is essential to recognize that many contracting firms employ multiple technicians who are actively involved in installation and servicing operations. To ensure the highest level of competence and expertise, it is imperative that these field technicians obtain certification in the specific specialties corresponding to the various equipment they handle.

To address this need comprehensively, the IRA funding initiative should prioritize the establishment of a mandate necessitating that all field technicians undergo rigorous training and certification in emerging specialties. It is imperative that funds be used towards certification, ensuring that technicians possess the requisite skills and knowledge to effectively handle these advanced systems.

This proactive approach not only enhances the quality of service within the HVACR industry but also promotes safety, efficiency, and customer satisfaction. By investing in the ongoing education and certification of field technicians, the industry can keep pace with technological advancements and consistently deliver top-tier service to its clientele.

Here is a list of certifications [recognized](#) by the Department of Energy:

- [**HVAC Excellence Heat Pump Service**](#)
- [**HVAC Excellence Heat Pump Installer**](#)
- [**NATE Certification with Heat Pump Service Specialty**](#)
- [**NATE Certification with Heat Pump Installation Specialty**](#)
- [**SMART Local Union No. 265 Training Program**](#)

5. What data is available to demonstrate that the proposed certifications in your response to Question 4 align with the skills and needs of California, meet energy workforce demands, and prepare that workforce to deliver energy efficiency, electrification, and clean energy improvements?

The United States Department of Energy has provided funding for a comprehensive study on this very subject, underscoring the importance of active participation in recognized certification programs. These certifications are developed through an open,

transparent, and consensus-driven process, involving subject matter experts (SMEs) representing various industry segments, including technicians, contractors, distributors, and manufacturers.

The core component of these certifications is the development of curricula, often referred to as job task analyses (JTAs). These JTAs are meticulously designed to assess and measure the knowledge, skills, and abilities (KSAs) of individuals seeking certification. Such robust certification requirements serve as a dependable benchmark, enabling California to confidently rely on certified professionals to address the evolving demands of emerging energy developments. By doing so, the state ensures that its workforce has demonstrated their expertise and competency in meeting the challenges posed by the ever-changing energy landscape.

6. What performance metrics and numerical targets should California use to measure impact throughout the 48-month period of performance of DOE funding sought by the CEC to provide contractor training for the IRA residential energy rebate programs?

The California Energy Commission (CEC) should establish clear and measurable targets for the program. Here are suggested targets:

Number of Accredited Schools: Measure the number of schools accredited to properly teach HVACR using the newly developed curriculum standards. This metric gauges the program's success in expanding the availability of high-quality HVACR education.

Capacity of Training Programs: Evaluate the capacity of school training programs by tracking the percentage of class size and attendance ratios. This metric ensures that the programs can accommodate a substantial number of students, promoting accessibility.

Teacher Training Attendance: Monitor the percentage of teachers attending training sessions, including conferences, manufacturer, and distributor programs, to stay

updated on emerging technologies. This metric emphasizes the importance of educators staying current in their field.

Certification Participation: Track the percentage of students, whether currently in the classroom or working in the field, who enroll in training programs leading to qualified certifications. Specifically, consider certifications recognized by the Department of Energy (DOE), such as HVAC Excellence.

Certification Pass Rates: Assess the percentage of testing candidates who successfully pass the certification exams. This metric measures the effectiveness of the training programs in preparing students for certification.

By setting and evaluating these targets, the CEC can ensure that the HVACR education program is both effective and accountable, ultimately benefiting students, educators, and the HVACR industry as a whole.

7. In the Community Benefits Plan required as part of the CEC application for DOE funding for contractor training for IRA residential energy rebate programs, how should the program ensure the delivery of measurable community and jobs benefits, and: 1) support meaningful community and labor engagement; (2) invest in America's workforce; (3) advance diversity, equity, inclusion, and accessibility; and (4) contribute to President Biden's goal that 40 percent of the overall benefits from certain federal investments flow to disadvantaged communities under the Justice40 Initiative.

Failing to invest in our workforce is not a viable option. The HVACR industry is currently in the midst of a profound transformation, driven by the adoption of next-generation heat pump systems, particularly cold climate heat pumps equipped with advanced technologies like inverters. To thrive in this rapidly evolving landscape, it is imperative that we adapt quickly and effectively.

This sweeping technological shift in HVACR has far-reaching implications across the entire industry, with a special focus on educators. Often, those leading classrooms in our community colleges are tasked with providing training on equipment they have not personally worked with. In addition to this challenge, educators must navigate the complexities of updating curricula, acquiring new skills, securing funding for state-of-the-art equipment, and obtaining approvals from various regulatory agencies. Their role in facilitating this transition is absolutely pivotal.

At present, our primary challenge lies in motivating our workforce to embrace change and undergo the necessary education to keep pace with these transformative shifts. Change brings forth new opportunities for those who undergo training and certification to meet the emerging industry standards. The key challenge, however, lies in developing a modern workforce capable of proficiently installing and servicing these new technologies, as well as handling the evolving refrigerants associated with them.

In essence, investing in our workforce and providing them with the education and tools they need to navigate this technological evolution is not just a necessity; it is imperative for the future success and sustainability of the HVACR industry.

8. [Input on other topics welcomed.](#)

The Strategic Plan to Reduce the Energy Impact of Air Conditioners stated that 72% of residential systems were oversized, 68% improperly charged, 70% had inadequate airflow, and 91% were untested for combustion efficiency. Another study shows that 82% of residential components returned to manufacturers have nothing wrong with them.

Not acting, is not an option! At present, it is more difficult to get a license to install bushes as a landscape designer or get licensed to cut hair in California than to install a gas appliance or wire it into homes. This current initiative, through proper training and

incentives, can provide HVACR professionals with training that will be essential to ensuring the equipment is installed correctly.

When Covid-19 was officially declared a pandemic, the HVACR industry was rightfully recognized as essential. It is crucial to acknowledge the substantial size and extensive scope of this industry, as well as its profound importance to society. This importance encompasses various critical functions, including but not limited to:

Food Distribution: The HVACR industry plays a pivotal role in maintaining our food distribution system by ensuring the proper functioning of refrigeration equipment and transport refrigeration. This is essential for keeping food fresh and available to communities.

Virus Containment: HVACR systems are indispensable in creating and maintaining airborne infection isolation rooms within hospitals. These systems help contain and mitigate the spread of infectious diseases, including the Covid-19 virus.

Data Centers: Cooling systems provided by the HVACR industry are vital for data centers, which, in turn, enable the functioning of essential communication technologies such as phones, the internet, and online meetings. These technologies have been crucial during the pandemic for remote work and communication.

Indoor Air Quality: HVACR systems also address indoor air quality issues, ensuring that indoor spaces are safe and healthy. This has been crucial for the reopening of schools and other facilities, as improved indoor air quality contributes to a safer environment.

In sum, the HVACR industry's essential role in various facets of our daily lives cannot be overstated. It is a linchpin in maintaining critical infrastructure, supporting public health efforts, and enabling the functioning of essential services during unprecedented challenges like the Covid-19 pandemic. Not acting will not only impact the California electrical grid but have real impact on people's lives.