Market Forces Accelerate Adoption of New Industrial Energy Efficiency Certification Program, Energy Savings, and Long-Term Partnerships

Kim Hughes, Northwest Energy Efficiency Alliance (NEEA)
Geoff Wickes, Northwest Energy Efficiency Alliance (NEEA)
Jennifer Stout, MetaResource Group
Steven Scott, MetaResource Group

ABSTRACT

This paper surveys the impact supply and demand side market forces have on accelerating adoption of a new energy efficiency certification for industrial refrigeration professionals. Launched in November 2013, adoption of this Refrigerating Engineers & Technicians Association's (RETA) Certified Refrigeration Energy Specialist (CRES) certification is driven by the synergistic efforts and motivations of refrigerator facility managers, service providers and utility energy efficiency program managers. Specifically:

- Managers of industrial refrigeration facilities support CRES by encouraging their employees to become certified. They are excited by the bottom-line results: managing energy use through CRES improves operational costs, productivity, product quality, safety and reliability.
- Industrial refrigeration companies leverage CRES to improve their competitive advantage through sustainability activities when bidding on business with big customers like Wal-Mart or Starbucks.
- Service providers recognize that CRES-certified operators have proven capabilities to optimize plant operations and upgrade equipment.
- CRES certification helps utilities sustain their energy portfolios and meet savings goals through the complementary activities: CRES required activities help drive participation in Refrigeration Operator Coaching (ROC), implemented by the Bonneville Power Administration, Idaho Power and Energy Trust of Oregon.

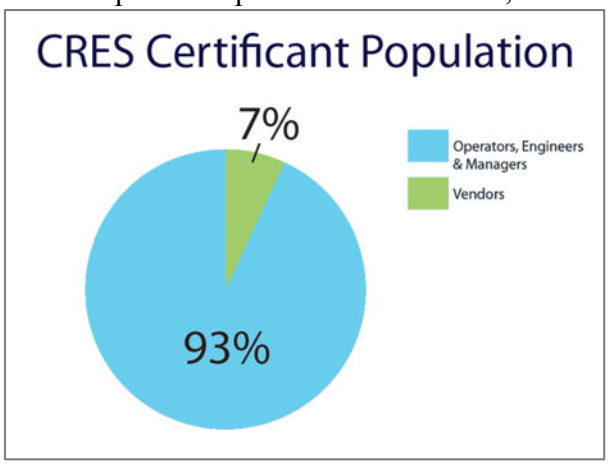
Executive Summary

For over nineteen years the Northwest Energy Efficiency Alliance (NEEA) has partnered with utilities and market actors to accelerate energy efficiency adoption and achieve industry savings and sustainability goals through market transformation. The Refrigerating Engineers and Technicians Association (RETA), represents the operators of industrial refrigeration systems for cold storage, food distribution and processing plants nationwide. RETA's primary mission is the development of refrigeration professionals through certification programs that promote safe, reliable operation of large, ammonia-based industrial refrigeration systems. RETA is trusted as an industry association because of the quality and rigor of their certifications and dedicated service to the refrigeration community.

This paper demonstrates the benefits CRES certification brings to employees, employers, industrial companies, and utilities – impacting the organization's bottom line, safety operations, energy savings, and market advantage. We also discuss the role each supply and demand side market force has in accelerating the adoption of an industry certification program; the CRES model demonstrates that market actors can act in accordance with their mission statements while driving energy savings and achieving market transformation. Finally, we show that – through CRES – utilities, RETA, and regional groups raise the profile of national certifications and create a roadmap for similar market transformation efforts.

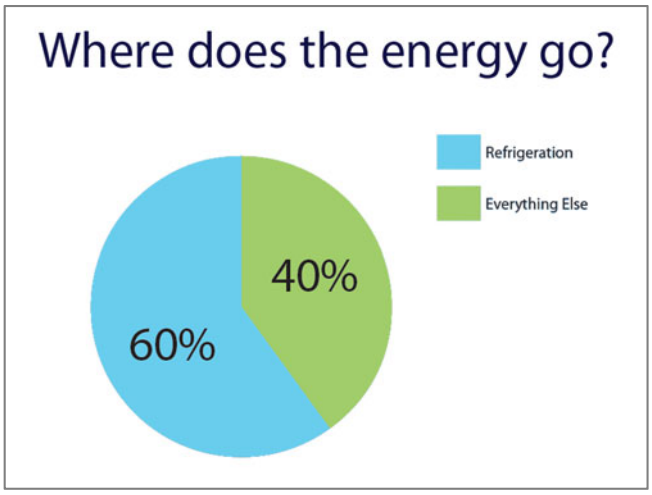
Introduction

In 2011, RETA and NEEA began a joint effort to develop a new specialist certification, Certified Refrigeration Energy Specialist (CRES), focused on safety, operational reliability and the energy-efficient operation of industrial refrigeration systems at food processing companies, refrigerated distribution facilities, and cold storage facilities. To date, 81 refrigeration service professionals, including engineers, operators, managers, service providers, technicians and vendors have applied for CRES. An estimated 7 percent of the applications come from vendors, with the remaining 93 percent representing professionals who either work at or directly service



industrial refrigeration facilities. CRES certification ensures that participants receiving their credentials have demonstrated energy efficiency knowledge and capabilities by requiring that applicants:

- Pass an exam
- Complete and document five hands-on energy efficiency activities for initial certification
- Complete six more activities every three years for certification renewal
- Complete an additional 12 Professional Development Hours (PDHs) for certification renewal



To achieve success in market transformation efforts, it is imperative to help market actors meet their individual goals to ensure buy-in and ongoing commitment. The CRES initiative is an example of market actors, utilities, and NEEA working in conjunction to drive energy savings, promote market actor goals, and achieve market transformation. Key drivers that encourage market actors to support market transformation include:

- Earning a CRES credential requires in-depth exploration of energy efficiency activities, training and technical assistance. Utilities support this certification because these activities require utility program participation.
- Since CRES is a certification that requires outside activities, not a training course, it drives participation in trainings, programs and activities offered by service providers and regional entities.
- CRES certification results in improved safety and operational reliability and an understanding of organizational benefits, thereby addressing RETA's goals for operator professional development.
- Because CRES requires activities for certification renewal, participants are likely to engage repeatedly in utility energy efficiency programs. The result is an increase in program savings and persistence.

The focus of this paper is to demonstrate 1) how utilities and market actors like RETA and NEEA work together to drive CRES adoption, 2) how utility programs complement and support the value proposition of CRES, 3) how leveraging RETA's certification program structure and reputation is essential to the market acceptance and success of CRES, and 4) how CRES generates increased demand for utility programs in the Northwest and nationwide.

How Does a Certification Result in Energy Savings?

In the industrial refrigeration sector, an average of 60 percent of the energy used is attributed to refrigeration operation. Though CRES is a certification and exam, not a training or set of classes, activities are mandatory to obtain the credential. These activities represent a tremendous opportunity for energy savings and participation in utility energy efficiency programs. Activities may include:

- Optimizing the energy use of compressors, condensers and evaporators
- Improving part-load performance
- Reducing system lift
- Applying effective defrost strategies
- Tracking facility energy use and developing an energy management approach
- Implementing efficiency improvements in both refrigeration and non-refrigeration loads

The savings potential for industrial refrigeration with CRES is significant; initial estimates indicate that CRES operators can reduce industrial refrigeration energy use by up to 12 percent per year[1]. For example, average distribution warehouses with 3,000,000 kWh/year total compressor energy use can:

- Upgrade to an energy-efficient low temperature system and save about 12 percent of compressor energy – resulting in 350,000 kWh, or $18,000, saved annually.
- Decrease their condensing pressure through energy-efficient upgrades and save about 7.5% of compressor energy – resulting in 225,000 kWh or $11,000 saved annually.

NEEA is engaged with a third party evaluator to review energy savings at sites employing a CRES operator. As results are compiled and the sample pool of CRES participants becomes viable for analysis, an average amount of energy savings per CRES certificant will be quantified. To realize the full potential for energy savings and program participation, it is critical for market actors to drive participation. Before focusing on the role of RETA, market actors, and utilities in driving market adoption of CRES, it is important to describe the two broad categories of market actors, and summarize the motivations to pursue and support CRES.

Demand-Side Market Actors

"Demand-side" market actors include operators, plant managers, and upper management of refrigerated facilities. These individuals see the business value of becoming CRES as gaining the capabilities to implement projects that impact the organization's bottom line while advancing their career. As refrigeration professionals realize value in becoming CRES, it helps ensure the success of the market transformation effort. For example, operators and plant managers become CRES to expand their professional qualifications, responsibility, and marketability. As a result,

[1] CRES activity reports submitted in 2013 by operators participating in NEEA's CRES Demonstration Training pilot show that energy savings could result in a 12 percent reduction.

plant personnel want to demonstrate, earn recognition, and potentially receive financial rewards for their energy efficiency efforts.

Upper management and company owners seek competitive advantage through an enhanced market image and external reporting; one means to achieve this is through investing in sustainability practices. Better understanding and investment in sustainability enables companies to better respond to the increasingly frequent requests for sustainability documentation from their customers. Upstream partners, such as Wal-Mart, Burger King, Starbucks and Costco, are beginning to require such documentation, yet this burden often extends to those lower in the supply chain. CRES professionals can support these efforts through documentation of their energy efficiency activities and projects.

> "Getting a guy to take ownership of the plant, of what he is operating, he will do a better job for you."
>
> Jeff Johnson, Trident Seafood Facilities Manager

Lastly, managers may assign responsibility for cost-management, maintaining and improving safety, reliability, and product quality to plant personnel. To ensure market transformation, it is important that management understands the value CRES operators bring to their organization, and how they help address business needs. In food processing companies, for example, energy is often the number three operating cost after raw materials and labor. CRES personnel help manage those costs, according to Dan Flick, former Puget Sound RETA Chapter Chair who says, "CRES gives you the tools to implement energy savings."

NEEA hopes to see these demand-side practices, along with the goal of a significant percentage of owners preferring CRES-certified employees, demonstrate to the market how all of the demand-side actors work in concert to drive the demand for CRES and the benefit it brings to their bottom line.

Supply-Side Market Actors

> "Just by implementing a small change in our control system we found we could run several days without defrost, which penciled out to more than $3,000 in savings."
>
> Dan Flick, Puget Sound RETA Chapter Chair

"Supply-side" market actors include service providers, vendors and utilities. These entities understand that as their customers become CRES certified, they will need, purchase and implement more energy efficiency services, products and programs. Utilities and vendors play an important role by providing programs and services that refrigeration professionals utilize to pursue their certifications. Service providers, equipment vendors, and system engineers will encourage more customers who have CRES operators to adopt energy-efficient equipment. Lee Troutman of Logix Controls, a controls company focused on industrial refrigeration, has found that offering solutions that optimize company control systems to reduce energy is gaining interest; they will roll out these solutions more quickly and cost effectively as interest in the marketplace grows.

Additionally, customers will be less likely to resort to making service and equipment choices based on the lowest immediate cost without taking into account lifetime savings – a CRES

professional has a deeper understanding of cost savings that correspond with energy-efficient equipment investments, resulting in reliable operations and a lower total cost of ownership. These supply-side services drive down the total cost of ownership for a new piece of equipment that includes lifetime energy costs. This is particularly important for the purchase of new equipment during the design and construction phase of new systems and facilities during large retrofits. In fact, managers of several prominent service provider and vendor firms are also interested in becoming CRES-certified to demonstrate their commitment to energy efficiency.

Lastly, utilities have goals associated with energy efficiency programs, interest in energy efficiency as a resource, and commitments to engage their customers. Utilities with programs targeting refrigeration facilities recognize the complementary nature of the CRES certification in driving customer engagement and helping meet their energy saving goals. In turn, utility refrigeration programs are key for achieving market transformation in the industrial refrigeration sector. In the sections to follow, we outline how – and why – utilities and RETA are working synergistically with NEEA to help drive CRES adoption, and why their role is especially important to this effort.

Leveraging RETA's Structure and Reputation to Achieve Success

In 2011, NEEA and RETA forged their partnership for CRES. NEEA provided resources and expertise in developing and implementing market transformation programs; RETA brings credibility as a market actor among the refrigeration operator and management audiences and experience in meeting ANSI's requirements for developing accredited certifications. ANSI offers an accreditation service for "certification bodies" – entities that develop certification programs for either products or personnel. Accredited entities must meet rigorous international standards.[2] ANSI is the only institution in the United States that can provide this accreditation service.[3] No other accreditation process is as stringent.

ANSI accreditation for CRES is essential to NEEA's strategy for this initiative. It signifies to refrigeration professionals and their management that the certification meets an extremely rigorous and transparent standard. RETA demonstrates the importance they place on this rigor through their mission statement: to enhance the professional development of industrial refrigeration operating and technical engineers, and ensure that operators and technicians are equipped with knowledge to safely run their equipment.

The industrial ammonia-based refrigeration market, with its focus on safe and reliable system operation, has already embraced, and continues to drive, the adoption of RETA's first two ANSI-accredited certifications, Certified Assistant Refrigeration Operator (CARO) and Certified Industrial Refrigeration Operator (CIRO). Since 2002, about 2662 refrigeration professionals have obtained their CARO and 1750 have obtained their CIRO. Anticipating that CRES will soon also become ANSI-accredited, refrigeration professionals are beginning to pursue this new specialist certification.

---

[2] Certification bodies for products must comply with ISO/IEC Guide 65. Certification bodies for personnel must comply with ANSI/ISO/IEC 17024, *General Requirements for Bodies Operating Certification Systems of Persons*, published in 2003 and recently adopted as an American National Standard.

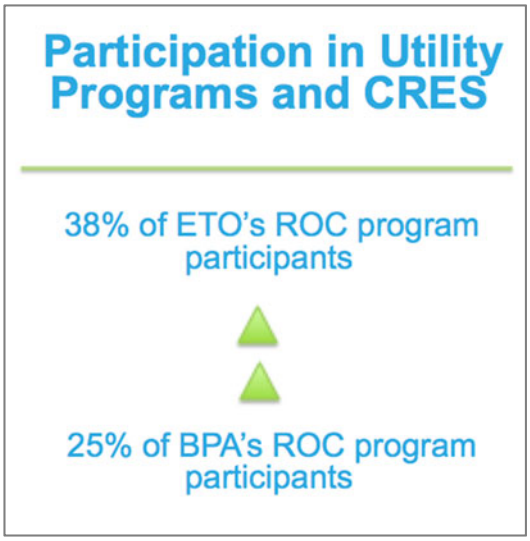
[3] ANSI is a member of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). ANSI's own accreditation process must comply with ISO/IEC 17011.

CRES Complements and Supports Utility Programs

An important difference between CRES as compared to CARO and CIRO is that utilities are an additional force driving market adoption of CRES. NEEA has coordinated with utility programs to demonstrate the business case for CRES and build market demand. Coaching, technical assistance and energy efficiency activities completed through utility programs can result in technical competence and documentation needed to achieve CRES certification. Given the connection to long-term benefits and the expansive activities needed for certification and renewal, utilities like Bonneville Power Administration (BPA) and Energy Trust of Oregon (ETO) view CRES as another tool to engage customers. Through CRES, these customers will have an increased awareness of and participation in utility energy efficiency programs including training, technical assistance, and incentives. CRES as an accredited professional certification serves these two parties' objectives in a way that is not just complementary, but interrelated.

The effort required to gain and maintain one's CRES credential is significant. The process not only engenders skills, it also stimulates participants' long-term commitment to energy efficiency by connecting the certification and required energy efficiency activities to professional benefits, such as career advancement by elevating the participants profile within the company. Further, customers will pursue utility programs to earn their CRES and complete the five hands-on energy efficiency activities required for initial certification, and then continue to participate in utility programs (six more every three years) to renew their certification. This ongoing participation will increase program savings and persistence over time, as well as continued dedication to professional development for the service professional.

Given the certification requirements, the support utilities provide is essential to passing certification. Utilities can position their technical staff and programs as resources for facility managers while providing direction on activities or measures. For example, NEEA is working with three of their funding entities on the synergies between CRES and the Refrigeration Operator Coaching (ROC) programs, implemented by BPA, Energy Trust of Oregon and Idaho Power. These resource acquisition and training programs involve intensive work with a "cohort" of industrial customers to help them identify, implement, and document low and no-cost operational improvements. These improvements include defrost optimization, condenser efficiency, maintenance practices, and best practice control schemes. Since many elements are complementary to both CRES and ROC and leverage utility measures, utilities are encouraging participants in ROC to apply for CRES and submit to RETA documentation of their ROC energy efficiency activities to meet the hands-on practicum portion of the CRES requirements. Three of the eight companies participating in Energy Trust of Oregon's 2014 ROC cohort indicated interest in pursuing CRES as a company goal, as well as increasing facility energy efficiency through ROC. Similarly, four of BPA's 2014 ROC cohort expressed interest in pursuing CRES during the program.



Energy Trust of Oregon's Industrial Energy Improvement (IEI) program also has strong synergies with CRES. IEI provides incentives for low and no-cost energy efficiency actions; CRES requires applicants to complete and document the same types of activities for their individual certification. An operator at BrucePac (a large processor of meat products) who was documenting his five activities for his initial CRES certification also had these actions logged in the IEI "opportunity register," and incentivized by Energy Trust. He gained his CRES in February 2015, and both the operator and BrucePac will enjoy the associated benefits on an ongoing basis due to the certification's renewal requirements.

Another program that CRES complements is BPA's Energy Smart Industrial Program's High Performance Energy Management (HPEM), which focuses on applying continuous improvement practices adapted from Lean Manufacturing and Six Sigma. In cooperation with the customer's utility, HPEM staff facilitate a process whereby the customer puts in place the elements of an organization-wide approach to continuous energy improvement. CRES supports this process for refrigeration companies by creating qualified, engaged employees with a professional investment in energy efficiency. HPEM incentives are distributed incrementally to ensure that consistent energy management results in a direct financial reward along with lower energy use – perfect for CRES due to its renewal requirements, while simultaneously reinforcing the HPEM incentive structure.

Utilities play a unique and essential role in generating participation and awareness of CRES. RETA cannot promote the program exclusively due to their primary emphasis on plant safety and reliability, and the need to balance support and advocacy for CARO and CIRO. However, utilities can drive awareness of CRES in a number of ways, such as in market communications and implementation of their existing industrial refrigeration programs. Across all of these channels, it is important that utilities demonstrate not only the energy savings benefits to the customer, but the operational and financial benefits as well, as they work in conjunction with each other to drive participation and solidify market transformation.

Conclusions and Lessons Learned

CRES certification benefits employees, employers, industrial companies, and utilities. The CRES certification program can be a model for similar market transformation efforts in other industries and practices. This effort demonstrates that these market actors can act in concert and accordance with their mission statements while driving energy savings and achieving market transformation. Utility programs and regional entities can facilitate the energy efficiency activities, training and technical assistance that earning a CRES credential requires. CRES provides participants with additional tools to add value as an employee and assist in reaching career goals. Due to RETA's credential rigor, participants are also learning about safety, operational excellence, and the specifics of organizational benefits that promote a healthier bottom line. By working together to help drive CRES adoption, utilities, RETA, and regional groups are driving acceptance and success of CRES.

References

American National Standards Institute (ANSI)
About ANSI – Overview
www.ansi.org/about_ansi/overview/overview.aspx?menuid=1#.UUTzdldvB8w

Cascade Energy, Inc., 2010.
Industrial Refrigeration Best Practices Guide.
https://cascadeenergy.com/resources/literature/

Wickes, Geoff, Northwest Energy Efficiency Alliance (NEEA), Stout, Jennifer, MetaResources Group, Scott, Steven, MetaResources Group 2014.
Leveraging the Existing Certification Structure of an Organization for Energy Efficiency
https://www.aceee.org/files/proceedings/2013/data/papers/4_054.pdf

Northwest Energy Efficiency Alliance (NEEA)
www.neea.org

Refrigerating Engineers & Technicians Association (RETA).
www.reta.com