

Marketing Strategies for Building Operator Training

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ABSTRACT

Training for building operations and maintenance staff responsible for the day-to-day operations of our built infrastructure is fundamental to achieving the full potential of energy efficient buildings. A major challenge in implementing operator training is effectively reaching the incumbent building operations workforce. From over six years of training commercial building operators in the Midwest, the following actions have proven useful in establishing marketing channels and promoting support for better-trained commercial, institutional, and industrial building operators. First, securing utility sponsorship for the operator training program greatly increases awareness as the utility will directly market the opportunity to their medium and large C&I customers. Second, partnerships with community colleges and universities can provide a local connection to operators employed in buildings outside major metropolitan areas as well as increase market penetration by incorporating operator training into energy management degree programs. Finally, pursuing tuition rebates from utilities, State Energy Office education budgets, or other funding streams can reduce the cost for program participants and increase the likelihood employers will participate in the program. By instituting these strategies, nearly 2,000 operators have been certified over six years and the operator training program has expanded from two states to six states over the same period. Establishing dynamic marketing channels is crucial to capturing strong participation levels and ensuring long-term success of a building operator training program. As commercial building codes become more stringent and green building programs expand, expanding operator training programs using these techniques provides a path from commercial building design to efficient building performance.

Introduction

The proper training of building operators and engineers is a critical element in achieving an energy-efficient built infrastructure. The potential for energy savings in existing buildings is enormous and alongside the adoption of more stringent building codes and high efficiency standards for new construction is part of a comprehensive approach to addressing the U.S. Department of Energy's goal to reduce energy usage in all commercial and residential buildings.

Not only has training specifically designed for building operations and maintenance staff traditionally been limited, what training programs were available did not necessarily focus on the importance of energy-efficient operations for existing systems. Discussions with building operators indicate that many times day-to-day operations procedures are established by methods passed down from one employee to the next with little thought to the efficiency and the energy impacts of these processes.

Considering that buildings account for 48% of all the energy usage in the United States and approximately one-third of that usage comes from heating, ventilation, and air conditioning (HVAC) the need for proper training and the establishment of a standard of competence in the field is substantial. (EIA 2008)

Program Development & Overview

The Midwest Energy Efficiency Alliance (MEEA) is a collaborative network advancing energy efficiency in the Midwest to support sustainable economic development and environmental preservation. MEEA promotes the market transformation of energy efficiency technologies, processes, and best practices through policy advocacy, program design and facilitation, and piloting of energy technologies. The nationally recognized Building Operator Certification[®] (BOC) program is one of MEEA's flagship market transformation programs.

The BOC program was developed with funding from the Northwest Energy Efficiency Alliance (NEEA) from 1996-2001 and course content was created by the Northwest Energy Efficiency Council (NEEC) and a team of industry experts. BOC training is now available in twenty-three U.S. states through license agreements between NEEC and their state and regional partners such as MEEA. These license agreements define the products and services of the BOC program, giving the licensee the right to use and distribute the trademarked BOC program and copyrighted materials in defined geographic territories. There are currently seven partners administering BOC in different areas of the country including MEEA, and in total over 8,000 individuals have been awarded the BOC credential nationwide.

MEEA is the licensee for a multi-state region, and currently administers BOC in seven states through partnerships with utilities, community colleges, and state energy offices: Illinois, Ohio, Minnesota, Missouri, Iowa, Kansas, and Michigan (in order of program launch).

Curriculum

BOC is a competency-based training and certification program for operations and maintenance staff working in large commercial, institutional, and industrial buildings. BOC is offered at two levels. Level I training emphasizes energy efficient building maintenance practices, while Level II stresses advanced equipment troubleshooting and preventive maintenance. Level II participants are graduates of the Level I program interested in enhancing their skills further.

The training program consists of a prescribed series of courses on whole-building systems and is delivered in a traditional classroom format. With the exception of the two-day HVAC systems and controls course, each topic is covered in one day and courses are typically scheduled one per month over a seven-month period, however this schedule can be condensed to meet the needs of sponsors or partners. In an effort to provide a packaged, "one stop shop" curriculum covering the whole building, courses are not offered on an individual basis.

The program includes examinations given at the end of each day of training and outside project assignments that participants must successfully complete to earn certification. In-facility project assignments require participants to demonstrate competence in locating building equipment, distribution pathways, and control points; calculating facility energy consumption; critiquing HVAC systems operation; and sketching the facility's electrical distribution system. Program evaluations consistently show this element of training is particularly critical to participants as it provides opportunity to apply directly the concepts learned in class.

The BOC curriculum includes seven required Core courses in Level I, and four required Core and two of seven Elective courses, chosen by the program administrator, in Level II. The curriculum is shown in Table 1.

Table 1. BOC Course List

BOC Level	Course Number and Name	Core or Elective
Level I	BOC 101–Building Systems Overview	Core
Level I	BOC 102–Energy Conservation Techniques	Core
Level I	BOC 103–HVAC Systems & Controls	Core
Level I	BOC 104–Efficient Lighting Fundamentals	Core
Level I	BOC 105–Operation & Maintenance of High Performance Buildings	Core
Level I	BOC 106–Indoor Air Quality	Core
Level I	BOC 107–Facility Electrical Systems	Core
Level II	BOC 201–Preventative Maintenance & Troubleshooting	Core
Level II	BOC 202–Advanced Electrical Diagnostics	Core
Level II	BOC 203–HVAC Troubleshooting & Maintenance	Core
Level II	BOC 204–HVAC Controls & Optimization	Core
Level II	BOC 210–Advanced Indoor Air Quality	Elective
Level II	BOC 211–Motors in Facilities	Elective
Level II	BOC 212–Water Efficiency for Building Operators	Elective
Level II	BOC 213–Mastering Electrical Control Circuits	Elective
Level II	BOC 214–Building Commissioning	Elective
Level II	BOC 215–Electrical Motor Management	Elective
Level II	BOC 216–Enhanced Automation & Demand Reduction	Elective

A team of industry experts and authors organized by NEEC regularly updates the BOC curriculum. NEEC aims to update each BOC course on a two-year revision cycle; however, some of the courses may fall into a more as-needed basis depending on the subject matter and advancements in the industry. NEEC and MEEA both regularly monitor student and instructor feedback through course evaluations and regular instructor conference calls to identify areas for improvement and opportunities for revision.

The BOC curriculum and materials are currently only available to participants, instructors and program administrators to preserve the integrity of enrolling in the program and earning the certification. The BOC program materials consist of a series of dedicated student manuals for each course and a project workbook containing the in-facility or “take home” projects participants complete to earn their certification. Student manuals are excellent reference guides intended to serve only as information sources for participants who will also benefit from the delivery of this content by an instructor. NEEC owns the copyright for all BOC materials.

Accreditation

NEEC has invested considerable effort into accrediting the BOC program. These efforts support the integrity of the program within not only the training and education industry, but the facilities industry as well. NEEC’s state and regional partners regularly promote the program’s accreditation status in marketing efforts throughout the country.

The International Association for Continuing Education and Training (IACET) has approved BOC as an Authorized Provider, demonstrating it complies with the ANSI/IACET 1-

2007 Standard which is widely recognized as a high standard in the training and education sector. To earn this approval, training programs must submit a detailed application demonstrating competence in the 10 Standards set by IACET.

Numerous trade associations also accredit BOC, and many accept BOC training as a method for their members to earn or maintain CEUs towards association designations. Examples of these associations include National School Plant Management Association (NSPMA), Building Owners and Managers Institute (BOMI), and the National Association of Power Engineers (NAPE). MEEA has found this element to be an effective marketing tool when promoting the BOC program to experienced building operators- a group likely to be involved in these associations and continuously looking for ways to earn credit towards maintaining their designations.

Instructors

Potential BOC instructors are required to submit an application and qualified individuals are approved by NEEC based on their field expertise and instruction capability. Instructors are independently contracted by MEEA to provide training to students and most instructors are approved to teach between one and three BOC courses in the curriculum.

MEEA typically only contracts an instructor to teach a maximum of two courses per BOC series. We have found this to ensure participants receive the benefit of the dynamic range of expertise and experience within our instructor pool. Instruction techniques differ depending on the individual instructor's delivery style and the course content for each class, however, all instructors are required to follow the BOC material closely and can only utilize supplemental materials previously approved by NEEC and MEEA.

MEEA has developed and continually recruits for the instructor pool in our region. We have found it useful to have a complete instructor pool, one in which each course can be taught by at least one person, established in each of our six states for two reasons: first, it greatly benefits the participants to have locally based instructors familiar with state specific regulations, electric and natural gas utility companies, and climate; second, it can quickly become a heavy cost burden to reimburse travel expenses for instructors to travel between states in the Midwest.

MEEA has successfully recruited instructors from energy consulting and management firms, utility companies, community colleges and universities, and retired facilities professionals. MEEA considers it best practice to require newly approved instructors to observe a seasoned instructor deliver courses they plan to teach prior to instructing on their own. This provides new instructors an opportunity to become familiar with the classroom structure and survey at least one example of how the curriculum is taught to a group of operations and maintenance staff.

Training Coordinator

MEEA administers the BOC program in six states on an ongoing basis and can have between six and fifteen series occurring simultaneously. Our program staff are unable to attend each class in all our series, so it is necessary to have local training coordinators on site. Training coordinators have proven to increase greatly the value of the training program for participants for multiple reasons.

First, as the instructors vary from course to course and MEEA program staff can be located hundreds of miles away, training coordinators provide participants with an element of

consistency and personal attention throughout the training process, which can be up to seven months in length. Second, since participants complete in-facility projects following the course in which the subject matter is discussed and return in the next class, it is common for the instructor teaching the next class to be unfamiliar or unqualified to answer any questions participants may have on their completed project. An experienced training coordinator is adequately versed in the subject matter of each course and can provide valuable feedback to participants. Finally, inevitably participants will need to miss a course within the series for professional or personal reasons. The training coordinator is charged with ensuring participants remain on track for certification, encouraging participants to make-up the course exam and project in a timely manner.

It is significantly more effective for a local contact familiar with the participants to coordinate these details, rather than simply working through MEEA staff via email or phone. The benefit of a training coordinator is particularly evident in the case of an accelerated class schedule where participants have less time between classes to complete their in-facility projects and less time to make-up missed courses before the conclusion of the program.

For example, an accelerated program held over a two-month period specifically for building operators from the Chicago Public Schools and Museum of Science Industry in Chicago, IL consisted of 16 participants, of which 12 received certification – a rate of 75%. It was not possible to contract a training coordinator for this series per the unavailability of coordinators over this period. In contrast, MEEA partnered with Scott Air Force Base in Edwardsville, IL to provide an accelerated program in May 2009 and selected an experienced coordinator. This group consisted of 17 Air Force base operators, of which all 17 earned certification, well above the national average certification rate of 85%.

MEEA has recruited training coordinators from retired instructors, community colleges and past BOC participants.

Participant Profile

Building operators enrolled in MEEA's BOC program on average have a minimum of two years experience in operations and maintenance prior to enrolling in Level I. The average facility size for operators graduating from MEEA's BOC is 300,000 sq. ft, however BOC is appropriate for and includes operators of buildings as small as 50,000 sq. ft.

The concepts covered in BOC training are applicable to systems in commercial, multi-family residential, institutional and industrial facilities. MEEA's participants largely come from the institutional sector (K-12 school districts, community colleges, public buildings, etc.) but interest from property management firms and industrial facilities has increased in the past year. Most employers pay for the participant's BOC tuition, though there have been instances where an operator has paid out of pocket to attend BOC.

In the Midwest, it is common for building operations and maintenance staff to have completed their formal education with high school graduation and depending on age may have last completed an exam or 'take-home' project up to 10 to 20 years prior, leading to a significant amount of anxiety over completing the requirements for certification in some cases. The program is structured to allow participants to use their class manuals for reference during the examination, alleviating some of the anxiety participants may initially feel when informed of the passing grade requirement. This is also another aspect that benefits from the presence of a local training coordinator available to answer questions throughout the training program.

Midwest State Program Structure

MEEA serves as the regional umbrella for the seven states within the Midwest currently recognizing the BOC credential (Illinois, Iowa, Michigan, Minnesota, Missouri, Kansas, and Ohio). MEEA's original license agreement with NEEC included rights to administer the program in Illinois, Ohio, and Minnesota, with Illinois and Ohio launching in 2003 and Minnesota following in 2005. MEEA has since expanded the program to include Missouri (2005), Iowa (2007), Kansas (2009), and Michigan (2010).

MEEA must enter into secondary license agreements with each individual state and secure funding from either state energy offices or Investor Owned Utilities (IOUs) to cover NEEC's licensing fee, the dollar equivalent of 1% of the total state population.

The state energy offices (SEOs) in Illinois, Iowa, Michigan, Minnesota, Missouri and Ohio all either currently own or at one time owned (in the case of Ohio) the secondary license to the BOC program. MEEA was unable to secure funding from the Kansas SEO or state regulatory commission (Kansas Corporation Commission) to purchase the license and instead entered into a secondary license agreement with three IOUs providing electric service to 50% of the state.

While entering into an agreement with the IOUs allowed MEEA to expand BOC into the state, it is significantly more effective to have an overarching body such as the SEO own the state rights to the program for two reasons: first, it ensures BOC is available to building operators statewide rather than only in specific utility service territories; and second, it actively engages the SEO in program planning and implementation and greatly increases the likelihood the SEO will invest in the long-term success of the program. SEOs can provide valuable support to their individual state programs by assisting in the recruitment of building operators in state and public facilities, utilizing available funds in state education and training budgets to offer tuition rebates to program graduates reducing the financial burden on companies and organizations, and serving as the local administrator and training coordinator if desired.

Advisory Boards

Establishing a BOC Advisory Board in each state is invaluable to not only the individual success of each state's program, but also the health of the regional program. MEEA enlists a diverse group of stakeholders to sit on state BOC Advisory Boards and serves as the coordinator for quarterly conference calls and in-person meetings when appropriate. Our Advisory Boards are normally comprised of representatives from SEOs, IOUs, large municipalities, community colleges, local instructor pools, local training organizations, and others interested in the success of BOC. The Advisory Board plan for long-term sustainability and identifies marketing channels and opportunities for outreach within the state.

State Energy Offices

Many SEOs have funding available in education and training budgets that can be utilized to provide tuition rebates to operators enrolling in BOC training. In Illinois, the state receives utility support to fund grants and programs under the Energy Efficiency Portfolio Standards (EEPS). MEEA received funding from the state under the Building Industry Training and Education grant to provide tuition rebates to all building operators and engineers completing the

requirements for certification. This helps to reduce the cost of the training for employers and therefore increase registration across the state. By providing the rebate only upon certification, it provides a strong incentive for the participants to complete the entire program and fulfill the requirements for certification.

Utility Sponsorship

Utility sponsorship of BOC training helps MEEA to increase recognition for BOC, reduce costs to attend BOC in some areas, implement effective and targeted marketing strategies and develop a solid network of support in the region. MEEA recognized the power of utility sponsorship in the early stages of our program development, and continues to pursue and maintain these relationships to great success. To date, MEEA has partnered with 18 utility companies in varying capacities and has witnessed firsthand the resulting impacts on reaching the building operator audience. State programs supported by the involvement of IOUs are enjoying robust BOC participation numbers and are seemingly immune to the damaging effects of eliminated training and professional development budgets due to the economy in 2008 and 2009. We feel this is a result of direct utility marketing and utility funded tuition rebates.

Our marketing and outreach model has two phases: first, MEEA provides utility key account managers with best practice marketing strategies and ensures they are equipped with the necessary information and materials to effectively promote BOC; and then the key account managers make personal visits or phone calls to their accounts to promote and discuss the benefits of the training directly. It would be nearly impossible for MEEA to replicate the results of this model without the support of the utility as identification and access to these facilities is hard to obtain without their involvement. MEEA educates key account managers through group presentations or webinars depending on the travel requirements for all the key account managers and MEEA staff to be at the same location. Additionally, MEEA has found BOC tuition cost (\$1,200 average in the Midwest) to be a participation barrier, especially in the current economy. However, this hurdle can be overcome by the presence of utility incentives. All of MEEA's utility sponsors provide a sizeable rebate to organizations sending building operators to BOC training once the operator completes the requirements for certification. Typically, this rebate is 50% of the tuition cost.

MEEA has found Midwest IOUs look to each other for program ideas quite frequently and are interested in providing their customers with the same opportunities as consumers in neighboring states. Therefore, the more utility sponsors MEEA's regional program has in the fold the more likely others will be inclined to come on board thus increasing recognition and awareness of the program, and the number of Midwest operators that will enroll in training.

IOUs are interested in BOC sponsorship for several reasons. It provides the opportunity to connect with their customers by offering an energy and cost savings program, market their residential and C&I direct savings programs during class breaks and lunch, and quickly launch a fully developed, turnkey program with minimal administrative requirements and count resulting energy savings towards savings requirements pending Public Utility Commission (PUC) approval.

Utility companies also embrace BOC training as way to strengthen business relationships with their customers. In providing BOC training, IOUs demonstrate their commitment to energy efficiency and helping their customers reduce energy usage and costs. Several Midwest utility sponsors host graduation ceremonies at the conclusion of the training series to show their

appreciation and recognize the efforts of the operator and invite not only the BOC participant but their supervisor as well. Additionally, utilities often host the training at their facilities and give participants the opportunity to tour their headquarters and O&M department.

IOUs across the Midwest are facing increased regulation from PUCs requiring aggressive efficiency targets and are expanding their program portfolios to meet these requirements. BOC is a nationally recognized, turnkey program that can be easily implemented to help meet these targets with minimal administrative burden on the utility as MEEA handles all aspects of program coordination.

BOC has been independently evaluated and proven to result in electric and natural gas savings in facilities. Evaluations have concluded building operators employing the tips and tools learned in BOC training can save their facilities 0.35 kWh per sq. ft and 0.74 therms per sq. ft. annually. (RLW 2005) In a small facility of 50,000 square feet, this could translate, using average energy prices, to over \$1000 in electric bill savings and \$277 in natural gas savings annually, easily recouping the initial investment of \$1,200 in tuition. A recent evaluation conducted on the BOC program sponsored by Kansas City Power & Light (KCPL) concluded their two-year program resulted in an estimated savings of 9.2 million kWh, 2,300 kW, and 35,000 therms effectively cementing BOC as an attractive addition to any utility program portfolio designed to generate energy savings to meet regulatory requirements and/or load reduction targets. (Opinion Dynamics 2009)

Secondly, IOUs view BOC as an opportunity to drive participation into their other direct savings and incentive programs. Several of MEEA's BOC utility sponsors directly market their available commercial and industrial (C&I) efficiency upgrade rebates during the BOC courses that correspond with the rebate. For example, the utility may distribute their "Chiller & Rooftop A/C" rebate applications during a *BOC 103—HVAC Systems & Controls* course in anticipation the participant will recommend the incentive to their supervisor back in the facility. BOC has been proven to increase operations and maintenance staff's receptivity to energy efficiency projects and a recent evaluation of the program reported a pool of 10 BOC graduates completed 14 different energy efficiency and demand saving actions at their facilities due to their participation in BOC training. (Opinion Dynamics 2009)

While IOUs may immediately see the value in BOC, two things are often necessary for it to be added to a utility program portfolio; first, the program may be subjected to a Total Resource Cost (TRC) test; and second, the utility may need PUC approval for energy savings associated with BOC. These are not necessarily required for IOUs to sponsor BOC (regulation varies within the Midwest region) but both are instrumental in retaining the involvement of utility companies long-term.

IOUs often conduct their own TRC test with in-house evaluation, measurement, and verification (EM&V) staff, and while market transformation and training programs historically have a difficult time passing cost-benefit tests due to behavior assumptions, BOC has passed numerous TRCs conducted in the Midwest. Notably, the Kansas Corporation Commission (KCC) performed a series of cost-benefit tests on BOC in 2009 and found the program had a positive benefit-cost ratio (a score of greater than 1.0) on all tests with the exception of the Participant Test. (KCC 2009) Additionally, numerous impact and process evaluations have been completed on the state and regional BOC programs (NEEA 2010, Opinion Dynamics 2009, RIA 2003, RIA 2006, RLW 2005, Violette and Cooney 2003) and PSC's often look to the energy savings reported in these evaluations to assist in their determinations.

Table 2. MEEA’s Utility Sponsorship Structure for BOC

State	Sponsors	Aspects of Sponsorship
Iowa	<ul style="list-style-type: none"> • MidAmerican Energy Co • Alliant Energy • Black Hills Energy 	<ul style="list-style-type: none"> • Utility sponsors provided start-up funding to support the program for 3 years • Utility sponsors participate on Advisory Board • Utility sponsors provide tuition rebates upon certification • Utility sponsors require BOC participation for eligibility for certain EE and rebate incentive programs
Missouri	<ul style="list-style-type: none"> • Ameren UE • Columbia Water & Light • City Utilities of Springfield • Empire District Electric Co • Kansas City Power & Light • Laclede Gas 	<ul style="list-style-type: none"> • Utility sponsors directly market BOC trainings to customers and set schedules • Utility sponsors provide tuition rebates upon certification • Utility sponsors participate on Advisory Board
Minnesota	<ul style="list-style-type: none"> • Southern Minnesota Municipal Power Agency (SMMPA) • Minnesota Power 	<ul style="list-style-type: none"> • Utility sponsors provide facilities, refreshments and on-site coordination • Utility sponsors directly market BOC to customers and set schedules • Utility sponsors provide tuition rebates upon certification • Utility sponsors participate on Advisory Board
Kansas	<ul style="list-style-type: none"> • Westar Energy • Kansas City Power & Light • Midwest Energy 	<ul style="list-style-type: none"> • Utility sponsors provide facilities, refreshments and on-site coordination • Utility sponsors directly market BOC to customers and set schedules • Utility sponsors provide tuition rebates upon certification • Utility sponsors participate on Advisory Board
Illinois	<ul style="list-style-type: none"> • ComEd • Ameren IL 	<ul style="list-style-type: none"> • MEEA receives funding through Illinois’ energy efficiency resource standard (EERS) to provide tuition rebates to customers of both utilities.
Michigan	<ul style="list-style-type: none"> • Detroit Edison • Consumers Energy 	<ul style="list-style-type: none"> • Utility sponsor provides facilities • Utility sponsors directly market BOC to customers • Utility sponsors provide tuition rebates upon certification • Utility sponsors participate on Advisory Board

Community Colleges

MEEA has found partnerships with community colleges in Illinois and Minnesota be valuable in increasing the reach of the BOC program and has held over 15 BOC training series in conjunction with community colleges since 2004. Our partnerships are designed in one of two ways; first, the BOC program can be scheduled as a stand-alone offering hosted at the college facility; and second, the BOC program can be integrated into a degree or certificate program.

Community colleges hosting BOC as a stand-alone offering typically do so under their workforce development department. These community colleges have established a reputable name in their communities for providing training, and this recognition helps to bolster the reputation of BOC in areas outside of major metropolitan areas where BOC or other similar training programs may be better known. Additionally, MEEA benefits from the experience of the community college in providing training to the community. Contacts at the workforce development arm of the college are familiar with the local businesses and facilities that would benefit from enrolling an operator in BOC training and can assist in strategic marketing.

Community colleges are also excellent locations for BOC training to be held, due to their modern AV equipment, comfortable classrooms and experienced training coordinators on staff. MEEA can reduce operating costs for classes held at community colleges when the college can provide a training coordinator for the participants.

MEEA worked with Wilbur Wright College in Chicago, IL to integrate the BOC Level I and Level II curriculum into the college's Occupational Certificate in Building Energy Technologies program. The BOC classes are held in the evenings so the eight-hour days are broken into two four-hour evenings, which can be conducive to individuals unable to leave their facility for full day classes. Wilbur Wright College must use NEEC approved instructors and materials for these classes and participants earn the BOC credential on top of their Occupational Certificate from the college. Utilizing the already developed BOC curriculum helped the college fulfill the need for the operations and maintenance component of their certificate program quickly and provided association with the BOC nationally recognized program. Wilbur Wright College has awarded over 70 Occupational Certificates in Building Energy Technologies. MEEA will be working to launch a similar degree program with Hennepin Technical College in Minneapolis, MN in late 2010.

Results

Employing the partnerships and marketing strategies described above, MEEA has certified nearly 2,000 building operations and maintenance staff in the Midwest. There is a notable difference in the number of participants in areas fully supported by utility marketing efforts versus those with lackluster support. For example, MEEA has struggled to penetrate the market in the Chicago metropolitan area due to lack of IOU marketing support often strains to fill classes to the minimum of 17 participants.

In contrast, Kansas City Power & Light (KCPL) heavily markets BOC to their customers and we have exceeded all the participation targets set forth at the program's launch in 2007. (Opinion Dynamics 2009) In two and a half years, KCPL has had 135 operators graduate from their sponsored classes while MEEA has certified only 202 operators in the Chicago area in over six years. However, individuals who have earned the BOC credential in the Wilbur Wright College program are not included in the Chicago-area figure of 202 participants, demonstrating MEEA's partnerships with community colleges can help to close the participation gap in areas without utility support.

Conclusion

Improving building energy performance requires investing in multiple improvements and measures. However, a building will only realize the full potential of those upgrades with the proper training of the operations and maintenance staff. "O&M personnel play a vital but unsung role in turning the opportunity of facility energy savings into the realization of those savings over time" (Price 2006). The Building Operator Certification (BOC) is one of several programs addressing this need and success in running a BOC program across a multi-state region involves strategically developing partnerships with other organizations. From recruitment of trainers, coordinators, and students, to securing program sponsorship from state energy offices and investor-owned utilities, to setting up advisory boards to oversee program development, the BOC program administrator must manage each component of the program's success. Strong partnerships with state governments, utilities, and community colleges are three proven ways to build a strong program infrastructure and ensure the program reaches as many building operations and maintenance staff as possible.

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