Wireless sensor technology can be integrated with Building Automation Systems (BAS) as a relatively low-cost method to implement energy efficiency measures by reducing installation costs, mainly associated with pulling wire for sensors. There are many potential applications for wireless sensors in building management, such as energy monitoring, lighting control, and HVAC control.

Demand-controlled ventilation (DCV) is one such application of HVAC that can be coupled with wireless sensor technology to result in more cost-effective, flexible installations. DCV is a strategy that uses CO2 or occupancy sensors to determine whether people are in the space and inform the BAS to control the rate and volume of air delivered to that zone. DCV typically has a payback period of about 4-5 years or less (Seventhwave, 2016, p.1) and can generate savings of up to $1.00 per square foot annually (Snohomish, 2018), which makes it a good candidate as an energy efficiency measure for building managers to investigate. Because DCV often has such a favorable payback, its implementation may be assisted by funding through utility rebates and/or state or federal grants, especially for non-profit entities or municipal, university, school, or hospital (MUSH) applications.

The cost to implement DCV can be further reduced by utilizing wireless sensor networks. This cutting-edge technology will likely soon become the new standard in energy efficient HVAC systems.

In a typical office building, wiring costs (labor plus material) make up approximately 45% of the installed cost for a new building and nearly 75% of the installed cost for a retrofit application (Huang et al., 2013, p. 2). Growing demand plus advanced technology have resulted in lower costs for wireless sensors in recent years, which are now comparable with costs of wired sensors. Demand is expected to continue to grow, which means economy of scale and further price reductions. Thus, these networks can save substantially over traditional equipment because of the lack of wiring required. Wireless sensor networks are also scalable and provide much greater flexibility in system design options compared with wired solutions.

Wireless sensors can run on rechargeable batteries, and some sensors are designed to renew their energy from environmental sources such as solar, temperature differences, or vibration (Huang et al., 2013, p. 4). This is an important development that can help reduce the potential for battery waste and maintenance costs over time, which will inevitably help this technology to become more viable (Kuruganti, 2018. p.3).

There are two main ways wireless sensor networks (WSN) can be implemented to achieve energy efficiency through building automation control. One way is to connect using an onsite BAS on a local computer. The other way is through the Internet of Things (IoT) by connecting to a BAS in the cloud.

There are several factors to consider when designing a BAS system using inputs from a (WSN): signal, power, communication protocols, reliability, and accuracy. An important factor to consider in implementing DCV with wireless sensors is sensor placement. CO2 sensors should be in a well-mixed
BOC Grads Making a Difference

Can you tell us a little about your background and when you got involved with BOC?


I began working for The Public Theater in 2012 as a cleaner picking up garbage at Central Park in New York City for a seasonal role. The seasonal cleaner position ended at the end of summer and I then took every available shift possible including overnight security and operations assistant. In September 2013 after one year without benefits and taking advantage of educational opportunities I was given an Assistant Building Engineer position. After not having a background in facilities management I continued to strive for more knowledge in this field because I had a passion for it and have been promoted to Building Engineer and now Chief Building Engineer. I have now earned over 30 certifications ranging from BOC Level 1 & 2, Fire Safety, LEED and many more.

Where do you work currently and what is your favorite thing about your job?

I currently work at The Public Theater after 8 years with the company. My favorite thing about working for The Public Theater is that it has allowed me the opportunity to learn all areas needed to ensure a successful career in Facilities Management. I have 8 years’ experience with my employer since the age of 24 and I am now 31.

Steve Knowlden

Can you tell us a little about your background and when you got involved with BOC?


Where do you work currently and what is your favorite thing about your job?

I am currently employed by NRG Systems in Hinesburg, Vermont. My favorite thing about my job is constantly being able to learn more about these unique buildings and their systems operations.

What energy savings project have you completed since you completed the BOC training?

I have completed 2 energy saving projects since I have taken my BOC classes. Both of the projects have been LED lighting upgrades. The first was replacing 122 high bay compact fluorescent warehouse fixtures with 44 high bay LED fixtures. The second was to retrofit 128 compact fluorescent pendant fixtures with LED lights.

Why did you choose this project?

The reasoning behind choosing these projects was 2 fold. The obvious was the energy savings converting from compact fluorescent to LED’s. What made the decision an easy one was the cost of replacing failing ballasts for the CF fixtures. Since many of these had to be changed, it was the ideal time to make the switch to LED’s.

(Continued on page 3, see BOC GRADS)
Q&A with BOC Instructor

Bill Eckman

How did you become involved with building operations and energy management?
I left new construction of residential and light commercial buildings to focus on energy efficiency. That led me to looking at efficient operations for existing buildings and a role as an instructor at the EnergySmart Academy at Santa Fe Community College. While at the college I connected with Plant & Operations on special diagnostics and performance problem solving (an ad hoc group of college staff who would take on special projects and problems). Over my years in this field, I’ve been asked to work on a number of special projects/problems not because of specific equipment/systems knowledge or expertise, but rather because I take a holistic view of the situation to help the team define root causes and identify implementable solutions.

When and how did you hear about BOC?
Somewhere around 2011, when Santa Fe Community College decided to offer BOC Level 1 for the first time. It was completely new, but I could immediately see the applicability and value for our staff and those operating a variety of buildings in our area.

What is your area of expertise in the field?
That is hard to pin down. In many cases people ask me to help with a problem, not because of a specific “area” of expertise, but rather a more generalist approach. While I’m relatively strong and experienced in lighting, efficient operations of HVAC, and optimizing maintenance tasks, my most asked for strength is my background in building performance and holistic approach to solving performance problems.

What do you see as the greatest challenge to facilities operations and maintenance in your particular field or to facilities management in general?
Identifying, training, and retaining capable staff. Our industry is not particularly attractive to many candidates that we would like to hire. Likewise, we still struggle to communicate the value of building a clear career pathway for outstanding staff members. We often lose staff to other departments/industries because our organizations often cannot see the full value of high-performing building operations and maintenance departments. I liken it to project management. It isn’t easy to quantify the cost savings that a high-performing project manager achieves.

Is there anything that surprises you when you teach BOC classes?
How little building operation and maintenance staff interact and share knowledge both externally and internally. I seem to expect that we would share the good and bad internally and readily, but that doesn’t seem to happen. I will have many students from the same organization in a class, and it seems like they share a lot more information, best practices, etc. in just a few interactions in class then they do the rest of the year at work.

Do you have any best practices or tips you’d like to share?
Reduce (or avoid) tunnel-vision when solving a problem. We often want to find a quick solution that aligns with our area of expertise. However, when we do this, we often miss the root cause of the problem, and our solutions tend to either be short-lived, or have many unintended consequences (other things that are affected, but unplanned).

How do you like to spend free time?
Designing new contraptions with my son. Sometimes we also get to build them. I also brew my own beer and tackle all sorts of house and yard projects. Currently we are redesigning a small bicycle/rc-car track in the backyard.
How did you become involved with energy efficiency initiatives?

The DC Sustainable Energy Utility (DCSEU) began work in the District of Columbia in 2011, operated by VEIC under a performance contract to the District Department of Energy & Environment. VEIC’s mission is to enhance the economic, environmental, and societal benefits of clean and efficient energy use for all people. The DCSEU contract combines energy savings goals with societal benefit goals, such as green job creation and investing in energy efficiency in low-income communities, making it a perfect fit for VEIC. With more than 32 years of experience in energy efficiency, VEIC operates three large-scale energy efficiency utilities: Efficiency Vermont, Efficiency Smart, and the DCSEU, and provides consulting services specializing in energy efficiency, clean transportation, and renewable energy across the country.

How did you and your company first hear about the BOC program?

One of our customers in District Government, the Department of General Services, informed us about BOC training and its potential benefits in creating green jobs, providing continuing education opportunities, and reducing energy use and costs in District buildings. We recognized early in the DCSEU's work that there was a knowledge gap for new technology in buildings, such as advanced data analytics, and that many of the existing building operators were reaching retirement age. Offering BOC training to facilities managers in the District was the perfect opportunity to invest DCSEU funding in filling these gaps with something that helped us achieve our goals while helping to train the next generation of facilities managers in the District.

How do you go about promoting the training to your commercial and institutional customers?

The DCSEU works directly with hundreds of large commercial and institutional customers who are constantly seeking ways to run their buildings more efficiently and reduce operating costs. BOC training has been an easy sell for us with these customers through word-of-mouth by our Account Managers, clearly helped by the fact that we’re investing DCSEU funds to offset tuition costs. The DCSEU also runs a Workforce Development program designed to provide District residents who are new to the workforce, between jobs, or looking for a career change with externships with local contractors or businesses in the green economy. Through job skills development, on-the-job training and certifications, direct work experience with contractors, and job placement assistance, the DCSEU helps externs discover new careers in sustainability. Some of these externs in the Workforce Development program participate in the BOC training. We would love to identify additional funds that would allow us to promote BOC to a wider audience and allow more customers and facilities managers to take advantage of it.

What benefits does BOC provide for your customers?

BOC training provides myriad benefits to customers and to facilities managers. First, it provides fundamental knowledge for novice to intermediate building operators, which is important as many in this field are retiring. It teaches facility managers not only how different building systems work, but how they work together. It also provides exposure and training to new, constantly changing technologies, like data analytics and building automation. All of these end up benefiting customers by helping their staff run their buildings more efficiently and reducing O&M costs.

What would you say is the sector breakdown for BOC training participants?

Nearly all the DCSEU’s BOC participants are facility managers at large C&I buildings in DC, which includes commercial real estate, hospitality/hotels, universities, hospitals, and multifamily buildings. In addition, the federal government, through the General Service Administration (GSA) has worked with the DCSEU to send some of its DC-based facilities managers to BOC training.

What type of feedback do you get on the training?

Both our customers and the facility managers who participate love this training. Owners get the benefits of a well-trained facility manager, and facilities managers expand their knowledge base and growth opportunities.

Is there anything else you’d like to add?

In addition to creating green job opportunities, by investing in BOC training in the District the DCSEU is able to claim energy savings attributed to improved operations and maintenance practices as part of its performance benchmarks.

With the recent adoption of the Clean Energy Omnibus Act of 2018, District buildings will be required to meet building energy performance standards or face penalties. Training like BOC will be critical to ensuring operators are in the best position to help their buildings meet or exceed those standards and understand how to make improvements if they’re not meeting those standards.
Window Technology Offers a Variety of Tenant Benefits

By Christopher Meek, AIA, IES

This article is the 2nd installment on Secondary Window Glazing. The first installment was featured in our Winter-Spring 2019 edition.

Secondary glazing systems (SGS) offer buildings owners the opportunity to improve existing window performance, increase tenant value and decrease operating expenses—all with virtually no disruption to ongoing building operations.

In many cases, the process of replacing windows in leased or otherwise occupied buildings is disruptive to tenants, especially in the case of tall buildings where access to the exterior is difficult. SGS, however, is easily installed in 20 to 30 minutes per window, providing a non-disruptive alternative to conventional full window and frame replacement. By adding a new single or double-pane insulated glazing unit (IGU) to older single-pane or non-low-e glass, SGS improves the window’s thermal performance with relative ease. In addition to limiting disruption, the SGS installation process side-steps many potential issues of encountering lead (from older paints) or asbestos that may arise in the process of a conventional window replacement project.

This straightforward solution comes with a host of benefits. SGS significantly improves thermal comfort, acoustics, and energy improvements, while bringing leaking, thermally inefficient single-pane windows up to the standards of current Class-A office buildings. SGS products reduce the heat and glare of the window to increase the comfort and productivity of people who occupy the perimeter spaces—potentially increasing the usable area by improving comfort at the perimeter of the building. In cooler climates, SGS technology can dramatically reduce the radiant cold effect of those positioned near existing single-pane window surfaces. In addition, in urban environments or near sources of noise such as freeways, airports, rail lines, and other transportation infrastructure, SGS products will substantially reduce unwanted noise coming through the windows.

This is a cost-effective, non-disruptive way to re-position underperforming buildings and firmly establish vintage buildings with the level of comfort and amenity expected in new construction. Until recently, the disruption and cost of making significant envelope improvements worked as a barrier for many building owners.

“Building owners want to upgrade windows to higher performance,” says Matthew Combe, Executive Director of the Seattle 2030 District—a non-profit organization that partners with commercial and institutional building owners to break down market barriers to building efficiency. “But the cost and disruption of retrofits can make the paybacks difficult to rationalize.”

As many building owners know, improved window performance dramatically decreases the heating and cooling loads that must be met by a building’s HVAC system—meaning windows are key to unlocking deep savings in existing buildings. While the reduction in HVAC energy use provided by SGS can save substantial energy in and of itself, the vastly improved building envelope allows for further high-efficiency technology including advanced, super-efficient radiant heating and cooling systems and very-high-efficiency heat-recovery ventilation technology. In many cases, this comprehensive approach has been shown to cut a building’s energy consumption in half. “Today’s energy-efficient windows can dramatically lower the heating and cooling costs associated with windows, while increasing occupant comfort,” said Mike Sheppy, Certified Energy Manager with Apogee Renovation. “Optimizing natural light can also contribute to a building’s energy efficiency and tenants’ wellbeing.”

Even with these benefits for building owners, operators and occupants, many building owners still don’t know about this effective solution to under-performing single-pane windows. Organizations like the Attachments Energy Rating Council (AERC) are committed to increasing awareness of this valuable product by providing scientifically supported industry-wide metrics for the performance of SGS, storm windows, blinds, and shades. AERC, a collaboration between the US Department of Energy and windows manufacturers, empowers decision-makers in the building industry to select products that decrease energy use and increase the thermal and acoustic comfort of their occupants—all without the disruption of a full window replacement. SGS is a shining example of the type of innovative, cost-saving and widely beneficial technologies that AERC would like to see implemented in the 3,400 commercial buildings.

ABOUT THE AUTHOR:
Christopher Meek, AIA is Associate Professor of Architecture at the University of Washington and a registered architect. He is Director of the Integrated Design Lab (IDL) at the University’s College of Built Environments. In this role, he consults with design teams and building owners in the Pacific Northwest and nationally with a focus on...
Curing Sick Building Syndrome With Innovative Technology

Innovative technology is creating green, smart and responsive buildings, and now it’s time to use it to help make buildings healthy too. When indoor air quality is poor, this can lead to sick building syndrome (SBS), a range of symptoms including headaches and respiratory problems that affect occupants of certain buildings, which then improve when they leave the vicinity. According to the EPA, Americans spend around 90% of their time indoors. If this time is spent in a poorly ventilated building containing electrical products, furnishings and microbes emitting harmful fumes, this can have a profound effect on health. With a deeper understanding of SBS, and the use of innovative technology, steps can be taken to create more energy efficient, clean buildings in the future.

Improving Ventilation And Air Quality

The natural power of the sun can also be used to trigger a responsive window system that naturally controls heat and light entering a building. This experimental technology could reduce reliance on HVAC systems and decrease energy use by up to 42%. Old and faulty HVAC systems are often cited as a cause of SBS, as poor ventilation can lead to indoor concentrations of some pollutants of up to 5 times higher than outside. Until new technology is readily available, thorough cleaning, regular maintenance and, if necessary, periodic upgrades of these systems is essential to improve indoor air quality.

Shining A Light On Microbes

Mold plays a significant role in SBS, as it produces toxic metabolites that are hazardous to health. It can thrive in the structure of poorly ventilated buildings, and especially in office kitchens, where water heaters and cooking facilities cause high humidity. According to the National Institute for Occupational Safety and Health, 5% of cases of poor air quality can be traced directly to microbial contamination. Molds cause a range of respiratory conditions from sneezing and coughing to asthma and allergic reactions. Unfortunately, the chemical cleaning products used to disinfect mold also contribute to SBS by giving off harmful vapors. In response to this problem, a hotel in Denmark has treated its rooms with a transparent and odorless cleaning technology. When activated by sunlight, the innovative antibacterial spray breaks down microbes, including mold spores, and purifies the air for up to twelve months.

No matter the business, we all want to save money.

With Idaho Power’s Commercial and Industrial Energy Efficiency Program, you can get incentives now on upgrades that will save you even more in the future. You’ll also be supporting wise and efficient use of resources in the place we all call home.

idahopower.com/business
Technical Webinars

BOC offers live instructional webinars throughout the year to keep you informed on the dynamic field of facilities management. Learn practical solutions to deal with the energy hogs in your building from industry experts. The 2019 webinars focus on occupational health and safety practices in buildings, utilize energy management information systems to identify and communicate energy savings opportunities, as well as explore advancements in HVAC and lighting.

For the BOC graduate, successful completion of the webinar and accompanying quiz provides 1.5 points towards maintaining your BOC Certification and .15 IACET CEU’s towards the renewal of industry certifications, certificates and licenses including but not limited to AIA, PE, LEED, IFMA, ASHRAE, and AEE.

BOC Technical Webinar Fall Schedule

- **September 18, 2019**
  Safety Practices In Building Operations

- **October 23, 2019**
  Going Beyond Benchmarking Your Building

Live webinars are held from 2pm to 3pm EST and once held are available online at our webinar library. Check out the BOC web site for details. And remember, BOC graduates who maintain their credential receive a 20% discount on the BOC webinar series.

Exam Preparation Webinars

The BOC program offers a variety of resources to help you prepare for the Certification Exam and achieve the designation of Certified Building Operator. Visit our website for the full complement of resources, including resource guides, a test taking tips webcast, and information on purchasing updated class materials. We also offer a series of four recorded webinars to help you prepare for the BOC Certification Exam. Each session focuses on a critical work function from the exam blueprint.

These are the four webinars, the price is $59 for a single webinar and $199 for the series of 4.

- **Maintain Energy Using Building Systems, Equipment & Envelope to Minimize Energy Use.** Overview of materials related to performing preventive & predictive maintenance; troubleshooting system & equipment problems & performing diagnostic testing; documenting equipment maintenance.

- **Operate Energy Using Systems for High Performance.** Learn more about what the exam covers related to equipment settings & system control points; measuring & monitoring energy performance; and sustaining energy performance.

- **Perform Technical and Administrative Duties.** Brush up on what you will need to know about maintaining records & reports, communicating with management, co-workers and occupants, and understanding building codes.

- **Maintain Indoor Environmental Quality to Standards.** This session will review information related to: measuring and monitoring IEQ parameters; IEQ issues; and developing and implementing an IEQ plan.

BOC Informational Webcast

**Wednesday, Aug 21, 2019**

8:30AM PST/11:30AM EST

Learn more about the BOC program, credential structure and how the program can benefit your career and organization.

Exam Prep Bundle

We also offer an Exam Prep Bundle that includes the 4 webinars, 7 handbooks and 8 practice tests for $399.

For more resources please go to: [https://www.theboc.info/certifications/exam/preparing-for-exam/](https://www.theboc.info/certifications/exam/preparing-for-exam/)

It’s Never Too Late

Though the deadline (March 30, 2019) has passed for submitting your maintenance application without incurring late fees, you can still bring your credential up to date.

Please note: Applications submitted after March 30 will incur a late fee of $25. Those received after June 30 will be charged a $50 late fee.

If you are interested in renewing your credential but were not able to complete the application requirements by March 30th, please contact our Maintenance Specialist, Amy Price at 407-256-2757 or email her at boc.creds@gmail.com. She will provide you with all the information necessary for renewing your credential at this time.

Maintenance Your BOC Credential

The continuing education of building operators improves their ability to cope with changing technologies, equipment, and practices. To keep your BOC credential current, a building operator must accumulate maintenance points. Five (5) points per year are required for Level I, and 10 points per year for Level II.

Maintaining these hard earned credentials demonstrates your commitment to the profession. Over 75 percent of employers interviewed see BOC training as a positive factor when reviewing resumes. BOC graduates believe their credential confers credibility. Over 90 percent believe it improves job performance.

Lean More About Maintaining BOC Credentials:

- Maintenance Process & Fees
- Maintaining Certification
- Frequently Asked Questions
- Activities and Points Earned Chart
- Maintenance Points Tracking Form (PDF)
BOC Continuing Education Event in Providence, RI

A Building Operator Certification (BOC) continuing education event was recently held at the Save the Bay Center in Providence, Rhode Island. Twenty-four BOC graduates and other facilities professionals heard from experts on topics such as lighting updates & advanced controls; commissioning & building performance; and state funding options. Speakers and topics included:

- Brian McCowan, Energy & Resource Solutions: Commercial Codes for Envelope & Building Science
- Margie McNally, Evergreen Consulting Group: Lighting Updates & Advanced Controls
- Dave Parker, CLEAResult: Cold Climate Mini Split Basics
- Pat Lillie, Viessmann: Commercial Domestic Hot Water Utilizing a Hydronic Boiler
- Pat Lillie, Viessmann: Maximizing Condensing Boiler Performance

BOC credential holders earned continuing education credit to maintain their hard-earned BOC credentials. Continuing education helps operators keep up with industry trends to be effective in their work and valuable to their department, extending energy savings in their buildings.

Save The Bay is a nonprofit organization dedicated to protecting and improving Narragansett Bay. The Bay Center is an award-winning green building that serves the community as a living classroom and community meeting space. The building represents Save The Bay’s approach to brownfield redevelopment and environmentally-friendly shoreline development. Workshop attendees enjoyed learning about the building and exploring the scenic grounds.

Thank you to the event sponsors:

For a complete list of FM tradeshows around the country, visit the BOC website at www.theBOC.info and go to the Continuing Education tab and click on Tradeshows.
BOC Joins the Smart Buildings Center

We here at the BOC program are excited to share that the Building Operator Certification is now a program of the Smart Buildings Center. You will notice that some BOC material (emails, slides, handbooks) will display the SBC logo and mission. However, this transition does not affect the BOC curriculum, content, mission, or standard procedures. We will continue to offer the BOC training and certification as you know it, with timely updates to curriculum on the latest technologies and practices in efficient building operations and maintenance.

There is no action needed on your part, nor any changes that will affect your training or credential. However, we did want to share the news so you can anticipate some of the new branding around the program. Please contact the BOC Help Desk if you have any questions.

BOC Announces New Training Manager

Melissa Sokolowsky was named the BOC Training Manager earlier in 2019 and handles all curriculum and training content for the program. Melissa is passionate about innovative solutions for a clean energy economy.

As Senior Project Manager at Northwest Energy Efficiency Council (NEEC), Melissa serves as Training Manager for the Building Operator Certification (BOC) program, performing curriculum development/updates and instructor approval/development. At NEEC’s Smart Buildings Center (SBC), she also manages the Tool Lending Library, develops educational events and resources, and provides technical consulting for the region’s commercial and institutional buildings industry.

Are you a Current Credential Holder

WIN FREE STUFF!

Twice a year, current credential-holders may enter a drawing to win merchandise such as BOC gear from our Shop, diagnostic tools, or reference manuals. Our next drawing for an Energy Saving Kit is September 13, 2019.

Congratulations to the winner of our April 2019 drawing, Jemmy Rezk, New York City Department of Transportation.

Enter to win here:
https://www.surveymonkey.com/r/bocsept2019

Another Benefit for BOC Credentialed Operators

BOC graduates who maintain their credential receive a 20% DISCOUNT on the BOC webinar series. Check out the webinar schedule and library at:
http://www.theboc.info/continuing-educa-
tion/webinars/

BOC TRAINING, ANNOUNCEMENTS & CONTINUING EDUCATION

9 SUMMER/FALL 2019

BUILDING OPERATOR CERTIFICATION NEWSLETTER
Appoint an Energy Champion and earn incentives as you save energy

Energy management for your business

The Commercial Strategic Energy Management (CSEM) program provides incentives, data, and training services to commercial customers who wish to achieve utility cost savings through behavioral changes, occupant engagement, operational improvements, targeted facility maintenance, and attention to utility accounting.

The CSEM program seeks to save energy through low-cost/no-cost measures and is designed to provide a quick return on investment.

PSE will help you:

- Identify capital, operational, maintenance and behavioral energy-saving opportunities
- Track and manage utility usage
- Access training opportunities and receive software reimbursement
- Earn financial incentive through energy efficient performance

pse.com/csem
How does the CSEM program work?

- Any PSE commercial customer that has a PSE portfolio consumption greater than 1,000,000 kWh or 135,000 therms is eligible.

- Typical candidates include school districts, local government facilities, banks, offices, hospitals, commercial real estate owners and hotels.

- Program participants commit to hiring, contracting, or assigning staff to perform CSEM activities over three years.

- The customer will be empowered with data and training necessary to implement energy saving measures.

- Customers can reduce utility costs by 10 to 15% over three years.

- PSE will provide performance-based financial incentives.

Looking to get started or have more questions? Visit pse.com/csem or call a PSE Energy Advisor at 1-800-562-1482.
area about 6 feet high. Occupancy sensors should be placed so that they don’t detect movement outside the zone. Set points should be determined by the designer using the ASHRAE 62.1 standard. The higher the set points, the greater the energy savings, but this needs to be balanced by occupant needs for safety and comfort. It is also important that the controls contractor turn over the system to the building operators with proper training. Sensors should be calibrated annually, and the system should be recommissioned from time to time to verify energy savings and detect any issues (Seventhwave, 2016).

When designed carefully, WSNs integrated with smart building controls can be of great benefit, especially given the falling cost of wireless devices as well as the rise in BAS implementation in recent years. Whether using existing onsite BAS or cloud resources (or a combination of both), carefully designed and installed WSNs are capable of streamlining building automation and dramatically reducing energy and labor costs. This exciting new amalgamation of technology is the next wave of innovative energy efficiency solutions for buildings.

References


You can earn 1.0 maintenance point towards your BOC credential renewal by taking a quiz on the material in this Feature Article (page 1) at: https://www.theboc.info/continuing-education/newsletter-quizzes/quiz-dcv/

Save Energy, Save Earth
Top 5 Savings

On average, a BOC Credentialed Operator saves 100,500 kWh of electricity a year. In 2018 alone, 1057 operators earned a BOC credential. That equates to:

- 82,122,684 less pounds of coal burned
- 173,918 less barrels of oil consumed
- 75,120 metric tons of CO2 saved
- 15,949 less passenger vehicles driven for a year
- 8,995 homes' energy use for one year

Let's celebrate! Earth Day 2019

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