

October 2017

### California Community College System Develops New Program to Prepare Building Operations Professionals

- Working with industry and apprenticeship stakeholders to identify workforce needs
- Aligning curricula with industry-recognized credentials
- Meeting state mandates to increase energy efficiency

#### Introduction

Have you wondered who is responsible for keeping your workplace comfortable and energy efficient? Building Operations Professionals manage the maintenance and operation of building systems and installed equipment, and perform general maintenance to maintain the building's operability, optimize building performance, and ensure the comfort, productivity and safety of the occupants.<sup>1</sup>

The California Community College System (CCCS), the largest system of higher education in the nation with 2.1 million students attending 114 colleges, has developed the High Performance Building Operator Program (HPBOP). The HPBOP's focus is on developing a new class of workers for managing intelligent buildings as a strategy for achieving the state's Zero Net Energy goals.<sup>2</sup>

#### Workforce Need

Building Automation systems, along with Heating, Ventilation, and Air Conditioning (HVAC), Advanced Lighting, and Energy Analytics form the core of the HPBOP training. As one indication of the workforce need, labor market demand for HVAC workers is strong. National employment projections from the Bureau of Labor Statistics indicate that employment opportunities for HVAC mechanics and installers will increase by 13.6% between 2014 and 2024, more than double the average of 6.5% for all occupations.<sup>3</sup>

#### Approach

"Our mission is to ensure that we're getting students into high skilled, high wage jobs," says Jim Caldwell, Statewide Director and Sector Navigator for Energy, Construction and Utilities for CCCS. "We provide the conceptual framework that helps faculty to develop curricula. We work with industry and other stakeholders to identify their workforce priorities and take that information back to our member colleges and target their most relevant programs."

The U.S. Department of Energy (DOE) and the National Institute of Building Sciences have worked with industry stakeholders to develop the Better Buildings Workforce Guidelines (BBWG) to improve the quality and consistency of commercial building workforce credentials for four key energy-related job titles, one of which is Building Operations Professional. For each job title, a committee of subject matter experts developed an industry-validated job task analysis (JTA), outlining key duties, tasks, knowledge, skills and abilities. Based on

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<sup>1</sup> U.S. Department of Energy, Better Buildings Fact Sheet  
[https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/CWCC/BBWG\\_Fact\\_Sheet.pdf](https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/CWCC/BBWG_Fact_Sheet.pdf)

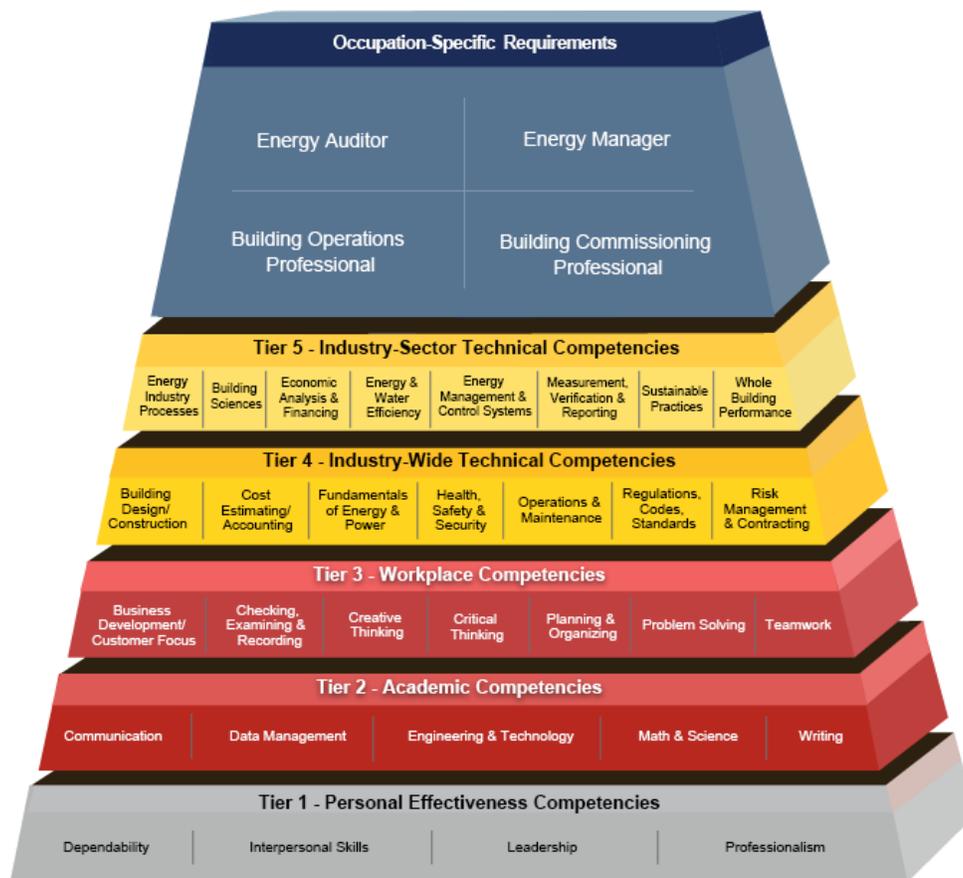
<sup>2</sup> California Community Colleges, Doing What Matters, High-Performance Building Operations Professionals  
<http://www.ecusectordwm.com/uploads/1/0/1/6/101615310/high-performance-building-operations-professionals.pdf>

<sup>3</sup> Bureau of Labor Statistics, Employment Projections, [https://www.bls.gov/emp/ep\\_table\\_102.htm](https://www.bls.gov/emp/ep_table_102.htm)

the JTA, each committee then developed complete guidelines for establishing certification and certificate programs. Certification and certificate program providers can adopt the BBWG. These guidelines enable them to develop new revised credentials that are high quality, industry endorsed and nationally recognized by DOE.<sup>4</sup>

“The development of the BBWG provided us with an opportunity to address California’s need to better prepare the commercial building workforce as well as meet state-mandated energy efficiency goals,” says Mr. Caldwell. “More than 500 recommendations on necessary competencies emerged from the JTA process. We used a subset of these recommendations as the framework for our Developing a Curriculum (DACUM) analysis for occupations classified as stationary engineers and boiler operators.” The CCCS team, working with apprenticeship program representatives and stakeholder advisory groups, utilized Tiers 4 and 5 of the U.S. Department of Labor, Employment and Training Administration’s Advanced Commercial Buildings Competency Model as a conceptual framework in applying the DACUM results to develop the HPBOP and inform the curricula.

### ADVANCED COMMERCIAL BUILDINGS COMPETENCY MODEL



Source: U.S. Department of Labor, Employment and Training Administration, Competency Model Clearinghouse, <https://www.careeronestop.org/CompetencyModel/competency-models/Advanced-Commercial.aspx>

The HPBOP will eventually be available for adoption at community colleges nationwide. More than 250 stakeholder organizations across the country were surveyed to gain acceptance of this ground-breaking program. Its initial target is custom training for journey-level workers, but the curriculum is planned for

<sup>4</sup> U.S. Department of Energy, Better Buildings Fact Sheet [https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/CWCC/BBWG\\_Fact\\_Sheet.pdf](https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/CWCC/BBWG_Fact_Sheet.pdf)

integration into Building Automation certificate and degree programs. Funding was provided by the National Science Foundation (NSF), Southern California Edison, Pacific Gas & Electric and the California Community Colleges.<sup>5</sup>

The momentum continues throughout the state. Laney College in Oakland, CA received a National Science Foundation grant to develop Building Automation curriculum and best practices that can be adopted by colleges nationwide. Planning began in early 2016 and pilot training was offered in early 2017. Twelve students, all journey-level workers from across the state who had completed their apprenticeship program, participated in the early training. The college used modules from HPBOP in the training, which also included work at buildings where these students were employed. Laney College and the Building Efficiency for a Sustainable Tomorrow (BEST) Center are developing a certification for the program. The college is also beginning to incorporate parts of the program in their certificate and degree programs.

In a related initiative, nineteen state community colleges are in the process of aligning their HVAC curricula with an industry-recognized entry level credential. “We worked with the Western HVAC Alliance, which includes workers, employers and manufacturers as members, to identify that credential,” says Mr. Caldwell. “It is benchmarked to the competencies in the HVAC Excellence Employment Ready credential.”

Similar initiatives are being directed towards other building operations-related occupations, such as building engineers and facility managers. For example, CCCS has signed an agreement with the International Facility Management Association to integrate their Essentials of Facility Management online curriculum into programs at twenty colleges statewide.

“We’ve also learned that employers are concerned about the lack of a work ethic in many young people,” says Mr. Caldwell. “In response to this challenge, the State Chancellor’s Office recently introduced ‘New World of Work’ to address Tier 1 competencies across a broad landscape of occupations.”

## **Next Steps**

“There is still much to be done to address the silos and fragmentation of California’s energy efficiency training landscape,” says Mr. Caldwell. “The California Energy Commission has provided resources to strengthen the alignment of forces. CCCS will lead the development of the Workforce Alignment Action Plan in concert with an industry-led forum focused on energy efficiency workforce mandates.”

## **Related Links**

California Community Colleges

<http://www.cccco.edu/Home.aspx>

Better Buildings Workforce Guidelines

[https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/CWCC/BBWG\\_Fact\\_Sheet.pdf](https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/CWCC/BBWG_Fact_Sheet.pdf)

Building Efficiency for a Sustainable Tomorrow (BEST) Center, Laney College

<http://laney.edu/ect/ect-nsf-initiative/best-network/>

Western HVAC Performance Alliance

<http://www.performancealliance.org/>

New World of Work

<https://www.newworldofwork.org/college-resources/>

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<sup>5</sup> *High-Performance Building Operator*, AutomatedBuilding.com, August 1, 2017, <http://www.automatedbuildings.com/news/aug17/articles/ecu/170725012808ecu.html>