

Superregional HVACR Collaborative

Draft Teaming Agreement

Mission

Develop a sustainable system of programs and credentials that deliver the knowledge, skills, and abilities that meet the regional HVACR labor market need in Southern California Edison Service Territory.

Build capacity to consistently align the number and types of completers of HVACR certificate and degree programs with the regional HVACR labor market need in Southern California Edison Service Territory.

Assure robust career pathways for continuing education and lifelong learning of students and incumbent workers across the spectrum of HVACR and related energy occupations.

Create a replicable model that can be applied to HVACR and other fields of study across the state.

Comments: Two colleges didn't check "Build capacity"
One college didn't check "Robust career pathways"

Objectives of the Collaborative

Document a roadmap for students, employers, and educators to plan careers, recruit employees, facilitate continuing education, and develop new courses and programs in response to the labor market need.

Align student learning outcomes across the career pathways with applicable industry-recognized credentials.

Create mechanisms such as articulation that enable effective transfer of credit among colleges to support seamless career progression by students and incumbent workers.

Build a support structure – counseling, career exploration, work-based learning, internships, employment readiness certification, recruiting and placement, etc. – that link students to employers and occupations.

Establish a Hub for pedagogical advancement, curriculum development, faculty development, lab enhancement, industry certification, articulation support, industry collaboration, and ongoing pathway development.

Cultivate sustainable funding streams to support formation of the Collaborative and its ongoing ability to adequately serve the needs of students and employers.

Comments: One college didn't check "Build a support structure"

Timeline

April 1, 2015 effective date for execution of an agreement by the colleges that establishes the Collaborative

June 1, 2015 formal launch date for the Collaborative, including initial funding

Year 1 accomplishments:

- Identify and agree on specialty of each community college
- Identify key SLOs of core courses and align across all colleges
- Establish linkages between curriculum and industry-established competencies
- Create the infrastructure and mechanisms to build capacity and programs
- Plan capacity and program improvements, including labs
- Meet with advisories on specialties and develop new courses as required
- Establish pathway programs with high schools
- Implement dual enrollment programs

Year 2 accomplishments:

- Complete curriculum development on specialty courses at each college
- Submit new courses for approval by curriculum committee at each participating college
- Implement capacity and program improvements, including labs
- Complete one-year cycle of core course instruction that did not require curriculum approval
- Articulate curriculum among colleges in the Collaborative
- Establish a system that create the pipeline for placing students into employment
- Place program completers
- Analyze data on program completers

Year 3 accomplishments:

- Place program completers
- Analyze data on program completers
- Modify curriculum based on results of data analysis
- Institutionalize the Collaborative and secure ongoing funding
- Propose a model for statewide adoption

Comments: All suggested Timeline items are included in the above

Agreements

Participation in planning and executing the strategy to build the Collaborative.

Assistance in acquisition of initial funding for the Collaborative.

Reasonable assignment of faculty, administrators, and subject matter experts to accomplish the objectives of the Collaborative.

Participation in building superregional career pathways:

- Industry collaboration
- Roadmap development
- Inventory of programs
- Analysis of student learning outcomes related to industry credentials
- Articulation of courses and programs or other means of transferring credit

Assistance in building a support structure that links students to employers and occupations.

Participation in program development with the Collaborative's Hub, and adoption of those programs within relevant college programs.

Assistance in cultivating sustainable funding streams.

Comments: One college didn't check "Participation in planning"
 Two colleges didn't check "Assistance in acquisition of funding"
 One college didn't check "Reasonable assignment"
 One college didn't check "Participation in building superregional pathways"
 Two colleges didn't check "Assistance in building a support structure"
 Two colleges didn't check "Participation in program development"
 Five colleges didn't check "Assistance in cultivating sustainable funding streams"

Anything else?

Develop an institute that creates an umbrella under which the colleges can operate.

This presents an excellent opportunity to collaborate and leverage resources to meet industry workforce demands.

Let's take action!

Establish work experience programs and online instruction.

Teaming Agreement for Superregional Career Pathways Heating, Ventilating, Air-Conditioning and Refrigeration: HVACR

January 31, 2015

Excellent meeting yesterday. Thanks to Bruce and Lanny for making it so successful.

Here's the industry feedback I picked up:

Tom Bowen of ABM and Kevin Devine of Brookfield, both big industry players, told me they are all in for whatever they can do to help. These two companies employ tens of thousands of workers in California, many of whom are right in our sweet spot. Both emphasized that HVACR is the gateway occupation for their building operations employees. Other job functions – lighting, building automation, fire and life safety, electrical, construction - all rely on skills needed for HVACR. They emphasized the need for greater competencies in a number of areas, which I'm sure will come out in the notes from the meeting. We also got new insights into their hiring processes that will help us better prepare students and the system for engaging employers.

Jake Huttner from Edison said his mind was exploding with all the new ideas, positive industry inputs, and our innovative process. He's ready to sign a letter of support. Pepper Hunziker, Edison's HVACR workforce consultant, expressed amazement at how fast we're moving and how totally relevant our work is to Edison's goals. Pepper previously talked with representatives from the United Associates Labor Union (UA), letting them know what we're doing. UA is interested in working with us, and Pepper has them standing by for the right time to engage with us. At some point we'll want to work with industry associations that have JATCs, plus the apprenticeship programs themselves, but that's down the road a bit.

Corey Lee Wilson committed to help us engage a critical mass of employers through IFMA, the International Facilities Management Association that he chairs for the Inland Empire. His facility manager constituents touch all HVACR employers – manufacturers, distributors, contractors, ESCOs, building owners, property management companies, etc. – which could be huge in identifying trends, skills gaps, job openings, work experience opportunities, and student placements. Corey will work with his counterparts in LA and Orange Counties to build a superregional employer base for the Collaborative. IFMA is committed to attract and develop new facilities managers to address the startling number of retirements they project by 2020. Corey and others at IFMA are putting a lot of emphasis on our Collaborative because of the potential it holds for building the pipeline they need in Southern California. The national IFMA organization is tracking our progress.

Chris Compton, who heads the Western HVAC Performance Alliance (WHPA) Whole Building Workforce committee, said we've solved a significant problem he's struggled with. The committee does good work, but there's no buy-in by the educators who would have to implement the committee's recommendations. So we agreed to change the paradigm. We'll keep Chris informed of our work so he can integrate it into committee discussions. And as the committee develops recommendations, informed by work we're already doing, Chris will bring them to the Collaborative for possible implementation. I think this meets Darrow's objective of slow and incremental involvement with WHPA to avoid getting us bogged down in committee stuff. It

also helps us establish a strong statewide profile and gain access to leading edge thinking, since WHPA is chartered by the CPUC and funded by the IOUs at > \$1M annually. As a not-so-trivial aside, WHPA's recommendations are delivered to the IOUs which receive ratepayer funds of \$30M annually for workforce education and training. This funding goes to Edison's Irwindale Energy Education Center and its counterparts at the other IOUs under agreements with the CPUC. Because HVACR is a huge part of the CPUC's Strategic Plan for Energy Efficiency and requisite IOU programs, I'd like to think our relationship with WHPA can help carve out a significant chunk of IOU funding for the Collaborative.

Dr. Scroggins' time with the group was greatly appreciated. Thanks, Steve, for making this happen. It's clear that Dr. Scroggins is a strong supporter, and it looks like the Collaborative may have helped Darrow make the case for a Campus as a Living Lab project at Mt. SAC.

So, I propose a couple of next steps: (1) Jemma and I work on the Teaming Agreement, and (2) set up a conference call to plan how we organize our approach to the 40% CTE Enhancement funds.

Attached is input from yesterday's meeting which seems like good raw material for a Teaming agreement to be signed by the colleges. A few observations:

There is good convergence among the colleges except in "Agreements" section. This may be because the attendees thought we were asking them to help fund the Collaborative rather than investing in programs and equipment for their college.

I'm a little surprised that the Timeline was so thin on establishing a Hub for the Collaborative. One college did include "infrastructure and mechanisms for to build capacity and programs", and another wrote "institutionalize the Collaborative". Professional development for faculty and pedagogical advancement didn't show up on the timeline, which are obvious functions for the Hub. There was not much emphasis on building out pathways across the region. I was pleased that the idea of creating a model for the state showed up on the Timeline of one of the colleges.

Lanny brought up the idea of creating an "Institute", which I think is the way to offset concerns about the Agreements and Timeline. We should make it clear that the Institute (a better way of looking at the Hub idea) will be facilitating all the things that we called out in the Mission and Agreements sections. This includes funding over and above the dollars the colleges raise for their own programs to align with the overall mission of the Collaborative. That way, each college can invest their own CTE Enhancement dollars, Prop 39 funds, IDRC grant money, etc. into programs and equipment that help their college advance the Collaborative's mission. Participation by faculty in fulfilling the Institute's superregional mission - again, over and above developing and aligning their own programs - could be funded by the Institute.

The other idea Lanny raised about the Institute was that it could become the umbrella organization that offers degrees and certificates for the superregional pathways. It's a clever way to mitigate the conflict over who gets credit for the certificate or degree, and could possibly make the conjoined certificate a more workable concept.

I think the above indicates that we can do a better job of communicating the vision and how we'll make it work. It's probably a good idea to spend some time documenting our value proposition to communicate with the Deans about having their college sign a Teaming Agreement. We've kind of positioned the Collaborative as a CTE Enhancement Fund initiative, when it's probably better to view it as an integrated system for meeting the regional workforce need over the long term. While CTE Enhancement offers the seed money, the real play is to develop (as Bruce pointed out) some real funding through NSF and others, and to arrange for "hard" dollars through mechanisms like those that could be established through the BOG Task Force.

Your feedback is welcome to help Jemma and me work through this agreement.

There is obvious enthusiasm among the faculty who have been attending these meetings. We should continue Bruce and Lanny's good work that encourages faculty to stimulate actions by their Deans in support of the Collaborative.

All in all, great progress. Bruce and Lanny – back to you.

Thanks everyone,

Jim Caldwell
Statewide Director and Sector Navigator
Energy Efficiency & Utilities



Mobile: (925) 899-2665

Main Office: 1141 Catalina Drive, Suite 272, Livermore, CA 94550



HVACR – Community College Collaborative

Preliminary Program Design

Context

The energy efficiency industry is experiencing extraordinary growth globally, nationally and regionally. Increasingly volatile energy prices, energy supply concerns, technology advances, climate change, regulations and mandates, and a desire for greater energy independence are all powering demand for additional energy efficiency efforts, and these pressures are likely to result in sustained long-term growth in the energy efficiency industry and related employment opportunities. Energy efficiency can be described as the decrease in energy (input) needed to do the same amount of work (output), or boosting the output per unit of energy input.

Employment projections suggest that the workforce will need to expand rapidly to meet the increasing demand for energy efficiency products and services. Energy services companies, government and utility efficiency programs, and building envelope and systems upgrade programs could grow substantially in the coming years. The activities of the industry, rather than being new efforts, often consist of a shift from standard practice to more energy-efficient approaches to design, building construction, installation, service and maintenance, and building operations. Sector workers will be required to possess and demonstrate a much higher level of energy efficiency related skills, knowledge and abilities.

One recent national study estimates the number of employees in the industry could double, and perhaps quadruple, by 2020. Some employers are already experiencing difficulties finding employees with specific training necessary for energy efficiency occupations. A well-trained workforce is important in designing and operating commercial and institutional buildings, which have increasingly sophisticated controls.

An aging commercial and institutional building workforce presaging large-scale retirement of technicians, combined with the rapidly growing need for professionals well-trained in building energy efficiency, has created the need for a comprehensive approach to improving the education and training of professionals.

Background

This design will inform development of a Southern California Community College: Heating Ventilation Air Conditioning Refrigeration / Building Operations Manager (HVACR – BOM) Collaborative.



CALIFORNIA COMMUNITY COLLEGES

Doing What MATTERS™
FOR JOBS AND ECONOMY

www.doingwhatmatters.cccco.edu

Representatives from Regional Community College faculty and management, Investor Owned Utilities, Building Operations and Efficiency Management Professionals, Economic and Workforce Development Agencies cooperated on development of this regional collaborative design on November 21 and December 19, 2014. Representatives and stakeholders from the HVACR manufacturing, supplier, constructor, servicing, and commercial building management industry segments will be invited and included in future gatherings.

The meeting was preceded by several months of planning as outlined in the attached:

- 2015 CTE Enhancement Funds – A Proposed Community College Collaborative
- Faculty on Special Assignment / Release time – Mt. SAC Program Development Facilitator 2014-15
- Exploratory and feasibility discussions with: Cypress College, El Camino College, LA Trade Technical College, Mt. San Antonio College, San Bernardino Valley College, Riverside Community College, and Southern California Edison Energy Education Center, California Building Owners and Managers Association, International Facilities Managers Association.

HVACR / Building Operations Management Technology

A Proposed Project for Community College Collaborative

Synopsis

An opportunity exists to align community colleges in Southern California Edison territory with the regional need for HVAC workers. This brief outlines the situation and proposes a sector strategy to achieve that alignment. The goal is to build a workforce that has the capacity and skills to achieve the goals of AB 32, the Global Warming Solutions Act, for the region's built environment.

A new paradigm can be created by viewing the pipeline of students moving through the region's community colleges as a whole, within which student learning outcomes are closely aligned with industry needs. On average, 393 students in the region complete HVAC certificate or degree programs annually. Annual averages of 175 HVAC apprentices graduate from the Local 250 JAC. A regional approach is proposed for comprehensive alignment programs across 6 community colleges to specific segments of the HVAC market, adding program capacity as required, executing new strategies for student success, building recruitment for underserved segments, and enhancing work experience and placement services.

Over time, the proposed sector strategy sustains a coherent pipeline of well-qualified students clearly targeted for HVAC and building systems management jobs in the region. The sustained HVAC collaborative project closes an annual gap in supply of 600+ HVAC technical and nearly 2,000 related occupations workers in the four counties. It also assures development of skills and knowledge that reflect employer priorities. A holistic approach engages industry stakeholders to guide the strategy, facilitates faculty professional development, establishes consistencies in



CALIFORNIA COMMUNITY COLLEGES

Doing What MATTERS™
FOR JOBS AND ECONOMY

www.doingwhatmatters.cccco.edu

student learning outcomes, expands labs, and integrates workforce investment board (WIB) capabilities for student assessment, support services and placement into employment. Leveraging funds from multiple sources, the strategy builds a framework of stackable credentials and provides pathways for industry-recognized certifications.

Full implementation of the plan is expected to take three or more years. Phase 1 primarily addresses community college and apprenticeship programs during the first two years. Program build-out and articulation with K-12 districts and universities are planned to begin late in Phase 1 and will be completed in Phase 2.

The Situation

A large body of research clearly delineates the need for intervention to build a workforce capable of achieving the state's energy efficiency mandates.

- An annual gap of HVAC workers needs to be bridged. Fourteen community colleges in Southern California Edison territory produce an average of 393 HVAC workers per year versus a projected annual demand of 1,261 through 2016.
- Significant skills gaps exist, indicating the need for training many of the region's 24,000 incumbent HVAC workers.
- Experience is more valued by employers than HVAC industry certifications, limiting employment opportunities for new workforce entrants and creating inconsistencies in recruiting standards among employers.

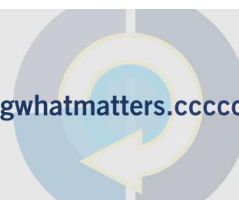
Individual colleges have developed employer relationships that inform their curriculum, help equip labs, and create industry awareness of their graduates' qualifications. These relationships are somewhat localized, resulting in programs that lack broader regional perspectives.

- The "pipeline" for entry-level workers is fragmented among many HVAC programs, creating gaps in addressing regional labor market needs.
- Capacity within colleges has been constrained by a number of factors:
 - Gaps in understanding regional labor market scope
 - Limited enrollment and lack of focus on recruiting students
 - Low investment in facilities and lab equipment in recent years
- Inconsistencies in developing student knowledge and skills exist among the region's HVAC education and training programs:
 - Student learning outcomes are not clearly aligned with employer expectations
 - Resources – faculty, curriculum, labs – can vary significantly by college
 - Systems do not exist for uniform adoption of new codes and standards such as the 2013 Title 24 Code or ASHRAE Standard 180
 - Energy efficiency measures are not a standard part of current programs, with concentration more typically on component-level operations and maintenance



Results of LA- Orange County- Inland Empire/Desert Completers - Average 393 Annual Completers

Row Labels	2010- 2011	2011- 2012	2012- 2013	3 Year Avg (2010- 13)
030300-Environmental Technology				
Environmental Technology-030300				
Associate of Arts (A.A.) degree	1	0	1	1
Associate of Science (A.S.) degree	7	4	6	6
Certificate requiring 18 to < 30 semester units	0	9	39	16
Certificate requiring 30 to < 60 semester units	0	2	15	6
Certificate requiring 6 to < 18 semester units	0	1	47	16
Environmental Technology-030300 Total	8	16	108	44
Environmental Control Technology-094600 Total	246	338	362	315
094600-Environmental Control Technology Total	246	338	362	315
094610-Energy Systems Technology				
Energy Systems Technology-094610				
Associate of Arts (A.A.) degree	1	2	0	1
Associate of Science (A.S.) degree	0	4	4	3
Certificate requiring 12 to < 18 units	1	4	8	4
Certificate requiring 18 to < 30 semester units	0	1	1	1
Certificate requiring 30 to < 60 semester units	1	31	42	25
Certificate requiring 6 to < 18 semester units	0	0	1	0
Energy Systems Technology-094610 Total	3	42	56	34
094610-Energy Systems Technology Total	3	42	56	34
UA Local 250 JAC HVAC Annual Graduates				175
Grand Total	257	396	526	568

**EMSI LMI Data for Sector Related Jobs****Labor Market Information for Group of EEU Occupations 2013-16****Counties Include: LA, Orange, Desert - Inland Empire**

SOC Code	Occupation	2013 Jobs	2016 Jobs	Change	% Change	Openings
49-9021	Heating, Air Conditioning and Refrigeration Mechanics and Installers	11,799	12,272	473	4%	1,261
47-4011	Construction and Building Inspectors	5,942	5,982	40	1%	672
47-2211	Sheet Metal Workers	5,260	5,314	54	1%	427
51.8021	Stationary Engineers and Boiler Operators	1,048	1,058	10	1%	82
Total:		24,049	24,626	577	2%	2,442

Acknowledgements

Contributions to this design were made by:

November 21, 2014 - Edison Energy Education Center**Community College Representatives**

Phyllis Barthel, El Camino College, Instructor
 Marvin De Costa, LATTC, Director Academic Affairs & Workforce Development
 Timothy Muckey, El Camino College, Instructor
 Matthew Needham, LATTC, Instructor
 Lanny Richardson Mt SAC, Instructor
 Daniel Shrader, El Camino College, Associate Dean

Darrow Soares, Mt. SAC, Instructor
 Carlos Urquidi, Cypress College, Instructor
 Albert Manialo, San Bernardino Valley College, Dean
 David Lindy Rio Hondo College, Instructor
 Doug Sallade, Cypress College, Instructor
 Jemma Blake-Judd, Mt SAC, Dean

Industry Representatives

Hackett Barney, SoCalGas, Program Advisor
 Paul Deang, SoCalGas, Program Advisor
 Gary Johnson, SoCalGas, Program Advisor
 Chris Lydoff, SCE, Program Manager
 Corey Lee Wilson, IFMA IE Chapter

Gary Shushnar, SCE, Codes & Standards
 Long Nguyen, SCE, Engineer
 Pepper Hunziker Tri Laine Associates
 Amy Discher, SCE, Account Manager

Foundation for California Community Colleges

Tim Aldinger, Director

California Community Colleges Doing What Matters Initiative



CALIFORNIA COMMUNITY COLLEGES

Doing What MATTERS™
FOR JOBS AND ECONOMY

www.doingwhatmatters.cccco.edu

Bruce Noble, DSN – Energy & Utilities
Jim Caldwell, Director – Energy & Utilities

Robert Chaboya, DSN – Energy & Utilities

December 19, 2014 - El Camino College

Community College Representatives

Phyllis Barthel, El Camino College, Instructor
Timothy Muckey, El Camino College, Instructor
Lanny Richardson Mt SAC, Instructor

Darrow Soares, Mt. SAC, Instructor
Carlos Urquidi, Cypress College, Instructor
Doug Sallade, Cypress College, Instructor

Industry Representatives

Corey Lee Wilson, IFMA IE Chapter
Pepper Hunziker Tri Laine Associates

California Community Colleges Doing What Matters Initiative

Bruce Noble, DSN – Energy & Utilities
Jim Caldwell, Director – Energy & Utilities

Robert Chaboya, DSN – Energy & Utilities

Economic & Workforce Development

Robert Mejia, EtherWorks, LLC

Preliminary Design

Initial Collaborative Members (January-2015)

Mt. San Antonio College
El Camino College
Los Angeles Trade Technical College
Cypress College

San Bernardino Valley College
College of the Desert (under
consideration)

Project Objectives

1. Identify or develop industry recognized energy efficiency (HVACR / BOM) credentials and certificates and degree programs and enhance existing programs to boost education and training system capacity.
2. Expand the number and scope of industry partnerships and stakeholder engagement to identify employment readiness and incumbent worker needs, and the foundational skills and knowledge requirements, for key sectors of the energy efficiency industry. Nurture a regional industry advisory.
3. Raise the visibility of energy efficiency careers and educational opportunities among youth and job seekers to expand the future workforce pipeline.
4. Develop articulated regional pathways among as many as 14 colleges over 3 to 5 years
5. Re-purpose incumbent worker training to develop a course for community college career and technical education students in preparation for entering the workforce.
6. Develop model curriculum and course delivery system that can be adopted for use by community colleges and apprenticeship programs statewide.



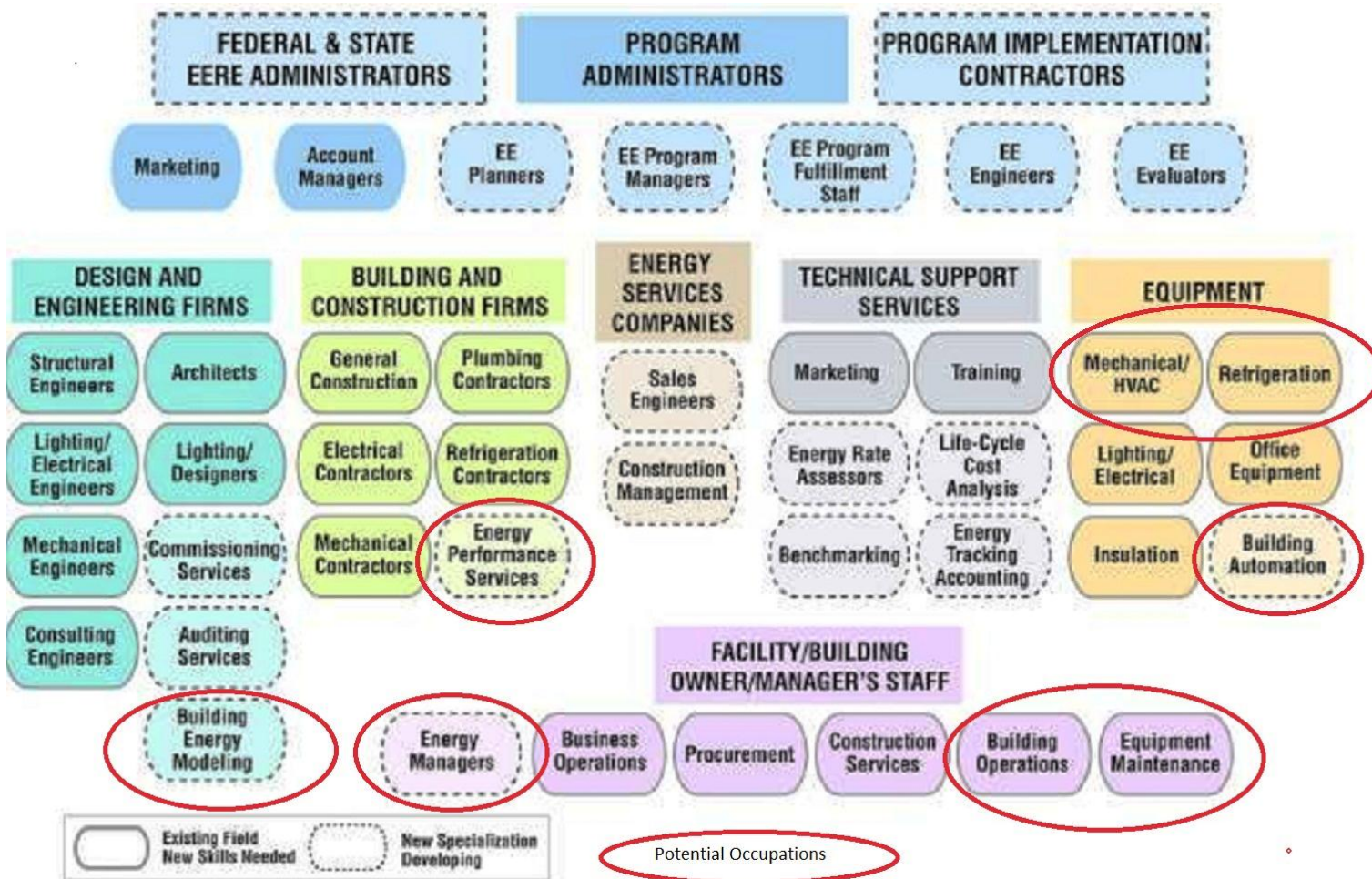
CALIFORNIA COMMUNITY COLLEGES

Doing What MATTERS™

FOR JOBS AND ECONOMY

www.doingwhatmatters.cccco.edu

Commercial and Industrial Providers of Energy Efficiency Services



Definitions: EE - Energy efficiency, EERE – Energy efficiency and renewable energy

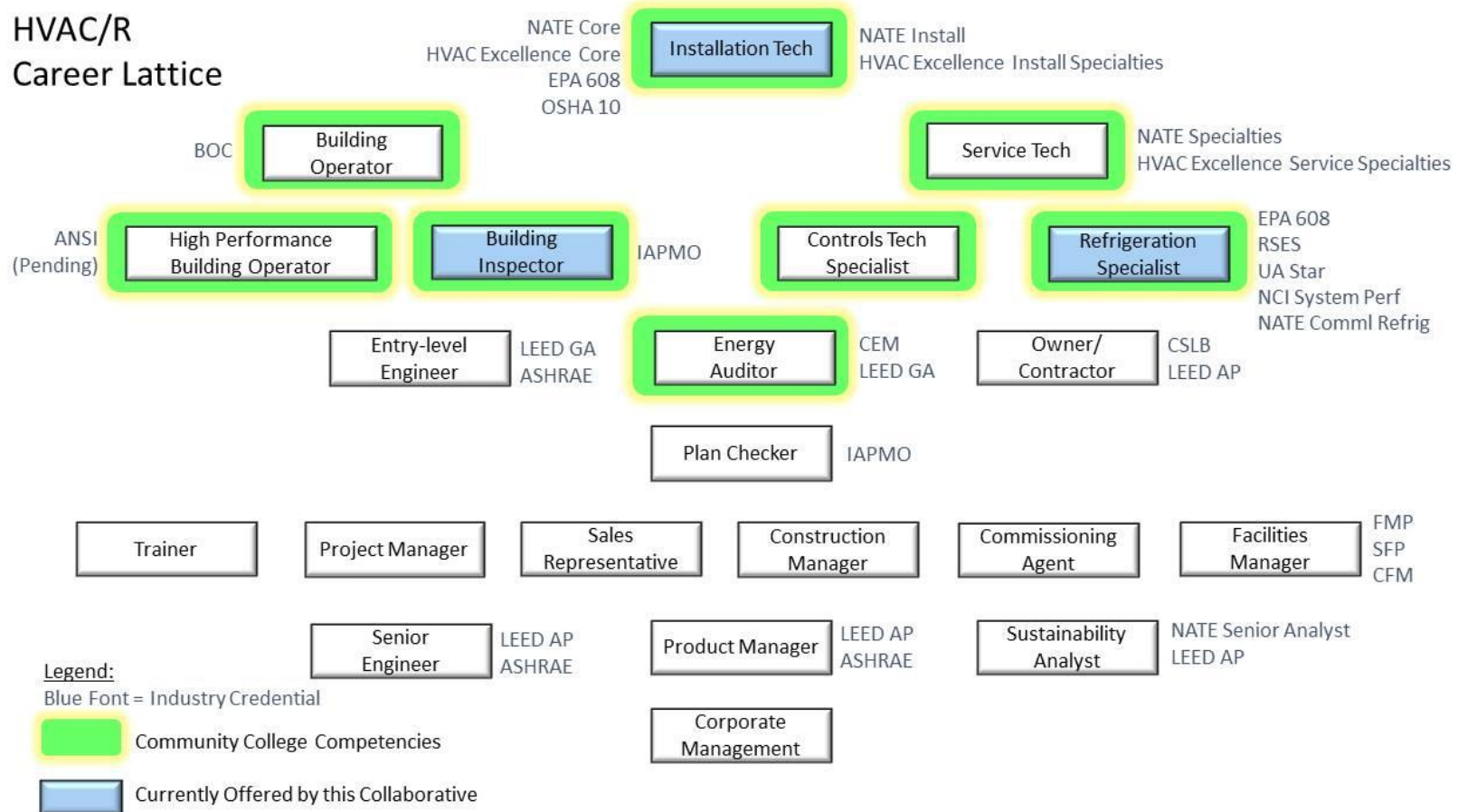


HVAC / BOM Technology

Career Lattice

Suggested from an exercise facilitated at the December 19th meeting

HVAC/R Career Lattice





Regional Advisory Target Audience

Industry/Trade Associations
Manufacturers and Distributors
Building Owners and Managers
Facilities Managers
Service & Installation Contractors
HVAC Service Technicians
Building Automation Systems Specialists
Existing CTE Advisory Committee Members

Proposed Student Learning Outcomes

Two levels of definition are proposed:

- As required for curriculum approval (Collaborative College & Chancellor's Office templates)
- As required to get industry buy-in for a detailed response to the workforce need

Recommendation for detailed industry review: Initial research via O*Net Online for each of the above occupations, capturing information that can be validated by the industry advisory council.

Sample Occupations:

Heating and Air Conditioning Mechanics and Installers
Refrigeration Mechanics and Installers
Building Operations Management

Translates to O*Net HVAC & Refrigeration Technicians, no specific listing for Building Operation Management currently identified
<http://www.onetonline.org/link/summary/49-9021.01>
<http://www.onetonline.org/link/summary/49-9021.02>

Format used in the US Department of Energy Job Task Analysis:

Student Learning Outcomes	Specialized Knowledge	Skills & Abilities	Tools, Technologies, and Resources

Final student learning outcomes – for both levels of definition - will be determined through dialog with the industry advisory council.



Overview of Priority Skill Sets

To Be Discussed

HVAC Excellence Employment Ready Certificate Matrix														
		Safety	Theory & Principles, Design & Function	Systems & Components	System Application	Installation & Service	Troubleshooting	Interpreting: Prints, Diagrams, Meters & Schematics	Fuels & Combustion	System Charging & Evacuation- Recovery	Building Pressure Knowledge and Measurement	Air Supply & Delivery	Fundamentals of Motors & Capacitors	Controls and
Electrical		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	
Heat														
	Electric Heat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>					
	Gas Heat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		
	Oil Heat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		
	Hydronic Heat		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
Air Conditioning			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>
	Commercial A/C		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
Basic Refrigeration			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
	Commercial Refrigeration		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
Heat Pump			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>
Diagnostics & Troubleshooting			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
CO & Combustion		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
	Carbon Monoxide Safety							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
	Combustion Appliance Zone										<input checked="" type="checkbox"/>			
EPA 608														
OSHA -10														
	Some of the core skills energy efficiency employers have identified include a number of technical and general employability skills.													
	<ul style="list-style-type: none"> • Basic math, writing, communication and analysis • Computers and networks • Energy technology and energy systems 			<ul style="list-style-type: none"> • Concern for the environment and community • Technical and plain communication • Flexible and able to adapt to change 										



Course Delivery Planning

Hours of Instruction or
Units to

Credential/Certificate?: The instruction/lab time required to cover all the priority skill sets in sufficient depth.

Delivery Format: Traditional Lecture-Lab? Flipped? Hybrid? Moodle?

Class Size: Typical class size is 20 to 30 students.

Venue: Classroom / Lab Requirements

Enrollment: Open? Cohort?

Industry Engagement

Curriculum development will be guided through periodic meetings with the collaborative and industry advisory. Special consultation may occur with key industry advisors to inform various phases of development and to address specific topics which need more analysis than would be appropriate with the full council.

Advisory Council Leader: TBD

Advisory Council Support: Bruce Noble, Deputy Sector Navigator
Energy Efficiency and Utilities

Methods: Virtual/WEB, Traditional, Blog/Twitter

Council Configuration: It is expected that the Council will grow to as many as TBD members in order to more fully engage industry stakeholders.

Enrollment Strategy: Collaborative members agreed to assist in developing and executing a strategy to engage a broad cross-section of employers.

In-Kind Services: In order to make the course fully relevant to industry needs, Council members may provide in-kind contributions along the following lines:

- Course content and training materials
- Guest lecturers
- Case studies
- Data for simulation and project-based learning
- Work experience related to student learning outcomes
- Specialized training sites for project-based learning
- Site visits
- Software, tools, instrumentation, and technology



Additional Resources

To Be Discussed

Next Steps

Faculty buy-in of the workforce challenge and proposed solution is the first and most essential step. Participating faculty and deans are supportive and engaged, the next step is to develop a hypothetical articulated program description that leverages current collaborative offerings and other available resources (e.g. Investor Owned Utilities curriculum, industry certification standards, industry stakeholder in-kind support) and offerings at other community colleges. Establish a framework for a MOU to allow for full program/course articulation, transferability, priority registration, resource sharing...Skills Panels or DACUMs with employer groups will add depth to the course description and identify gaps. Funding for course development and incumbent worker training can be facilitated in parallel with these activities.

Proposed Timeline

Timeline	Approximate Date
Initial Collaborative Meeting	November 21, 2014
Second Collaborative Meeting	December 19, 2014
Third Collaborative Meeting	January 30, 2015
Develop Collaborative Participant MOU	February 2015
Submit Collaborative Application for 40% CTE EF program	February 2015
Initiate dialogue on IOU support of "It's about Q"	February 2015
Finalize Certification Agencies and Requirements (NATE Core , HVAC Excellence Employment Ready , HVAC Industry Competency Exam (ICE), UA Star)	February 2015
Draft outline of Student Learning Outcomes and course topics	Mid-March , 2015
Compare intersections and gaps in available foundational curriculum /student outcomes	
Develop industry engagement / regional advisory strategy	
Save-the-Date Follow-up Meeting	February 27, 2015
Save-the-Date Follow-up Meeting	March 27, 2015
Final Detailed Student Learning Outcomes	
Explore Credit for Industry Credentials (Glendale / IHACI model)	
Future Collaborative / Advisory Council Meetings	
Finalized program definition and materials	
Articulated course availability and scheduling	

Contact:

Bruce Noble, Deputy Sector Navigator – Energy Efficiency & Utilities

bruce.noble@riocondo.edu

[\(W\) 562-463-7354 \(M\)949-300-3345](tel:562-463-7354)