The Case for Investing in the ECU Sector

Energy Construction & Utilities
California Community Colleges
Workforce & Economic Development

POWERED BY
California Community Colleges

California Community Colleges
2.1 Million Students
113 Colleges
✓ Energy Efficiency Labor Market Landscape
✓ Energy Efficiency Talent Pipeline
✓ Skills Builders Upgrade Program
✓ Platform for Success
✓ Investment Opportunities
EE Labor Market Landscape

Entry-Level Shortfall ≈50% Annually

Skills Upgrades Required: 215,000 Workers

Primary Occupations in the ECU Sector
- Facility Managers
- Building Operators
- HVACR Technicians
- Bldg Energy Systems Pros
- Control Systems Specialists
- Advanced Lighting Techs
- Energy Auditors
- Construction Managers
- Building Inspectors

Primary Research
- AEEI
- EMSI
- CCCCCO Datamart

Labor Market Supply
- Labor Demand

Entry-Level Shortfall
- EMSI

Labor Market Supply
- AEEI

What We Know From The Data

- Demand way outstrips supply for all ECU key occupations
- Replacement rate for retiring workers understated in the data vs. industry estimates by 2-3X through primary research
- Many ECU occupations not reflected at all in LMI data because DOL definitions are behind the market, e.g., “Energy Auditor” is “Cost Estimator”
- Some occupations’ skillsets are embedded in other occupations - e.g., Energy Auditing
Investment Strategy: Entry-Level Pipeline

**“MORE”**
(Skilled Workers)

- Partnership with IFMA
- Certificate within Business Degree
- Statewide Essentials of Facility Management License

**Facility Managers**

**HVACR Technicians**

- SoCal Collaborative: 40+ employers
- Partnership with WHPA Association
- Alignment of SLOs with Industry Standard
- Leverage to all 22 HVACR colleges
- Build 5 new programs statewide

**“BETTER”**
(Upskilled Incumbents)

- Energy Auditors
- Advanced Lighting Techs
- Automation Specialists
- Embed in Business, Construction, HVACR, and Engineering programs
- Embed in Electrical and Interior Design programs
- Embed in HVACR, Industrial Electricity, CIS, and Engineering programs

Energy Sustainability
Customizable Solutions - “More”

**HVACR Technicians**

**Facility Managers**

**HVACR**

Strong Workforce Investment Opportunity


[ECUSectorDWM.com/Strong-Workforce.html#HVACR](ECUSectorDWM.com/Strong-Workforce.html#HVACR)

**Facility Management**

Strong Workforce Investment Opportunity


[ECUSectorDWM.com/Strong-Workforce.html#FacMgt](ECUSectorDWM.com/Strong-Workforce.html#FacMgt)
Customizable Solutions - “Better”

Lighting Controls Techs

Advanced Lighting Technology
Strong Workforce Investment Opportunity


ECUSectorDWM.com/Strong-Workforce.html#Lighting

Energy Auditors

Energy Analytics & Auditing
Strong Workforce Investment Opportunity


ECUSectorDWM.com/Strong-Workforce.html#Auditing
Customizable Solutions - “More & Better”

Energy Systems Pros

Building Energy Systems Professional
Strong Workforce Investment Opportunity

ECUSectorDWM.com/Strong-Workforce#BESP

Bldg Automation Specialists

Automation
Strong Workforce Investment Opportunity

ECUSectorDWM.com/Strong-Workforce#Automation
Customizable Solutions - A Portfolio Approach

Energy Sustainability

Strong Workforce Investment Opportunities

ECUSectorDWM.com/Strong-Workforce.html#Sustainability
Customizable Solutions - A Portfolio Approach

Energy Sustainability

Engage.

ECUSectorDWM.com/Strong-Workforce.html#Sustainability
Skills Builder
Upgrade Program

Incumbent Workers and Career Transitioners
"A Trained and Fully Engaged Workforce by 2020"

321,000

Incumbent Workers

1. Advanced Energy Economy Institute, 2016
“A Trained and Fully Engaged Workforce by 2020”

215,000² Workers Needing New Skills

Enroll.

Employ.

Incumbent Worker Training Requirement

Training Capacity Needed: 72,000 Annually

Current Capacity (Estimated³): 10,000 Annually

1. Advanced Energy Economy Institute, 2016
2. Energy Marketing Innovations, 2014
3. Estimated Skills Builder Training, CCCC0 2016
The HVACR Technician Skills Gap

Current Workforce

Up to 50% of new HVAC systems and up to 85% of replacement systems are not installed and maintained to a quality level of specification.¹

CPUC set targets to improve HVAC performance by 50% by 2020 and 75% by 2030.

An opportunity to serve ~33,000 incumbent workers.²

2. Estimated 2/3 of approximately 50,000 workers
How Many Building Operators Need New Skills?

Current Workforce

- EMSI Estimate: 4,066 Workers
- Industry Estimate: ~70,000 Workers

OR?

- Bureau of Labor Statistics
- Local 39
- Local 501
- Building Owners & Managers
What New Building Operator Skills Are Needed?

✓ Reliability-centered maintenance practices
   replacing reactive maintenance

✓ Systems-thinking applied to whole-building systems
   replacing silo-driven troubleshooting and problem solving

✓ Building Automation Systems (BAS)
   preserving energy efficiency, proactive fault detection, and system-level troubleshooting

✓ Adherence to proven practices
   that do not sacrifice occupant comfort and indoor environmental quality for energy efficiency


Potential to expand Laney College pilot program statewide in 2018/19
Skills Builder Training for Facility Management Candidates

Facility Management Internal Sourcing Pools

1. CCCCCO Centers of Excellence, Facility Managers Needs Assessment, 2016
Skills Builder Training for Facility Management Candidates

Engage.

Enroll.

Employ.

Facility Management Internal Sourcing Pools

Office & Admin

Financial

Employers prefer to develop talent internally.¹

Statewide license and pilot programs at De Anza and Chaffey pave the way for expansion to several dozen colleges in 2018 and beyond

But need access to external training.¹

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1. CCCCO Centers of Excellence, Facility Managers Needs Assessment, 2016
Skills Builder Training for Contractors

The 2016 update of Title 24 Energy Efficiency Regulations requires new knowledge and skills in the Construction industry

Addressable Market
Total Market: 181,000 Building Contractors
Sub-market: 46,000 Construction Managers

2016 Contractor training pilot at San Diego City College can be expanded statewide

1. Employment Development Department California Labor Market Information Division, December 2016
2. EMSI 2016
Platform for Success
Alliances In Place

Engage.

ZeroNetReady Partnership

Enroll.

Industry Participation

Employ.

Professional Services Alliance

ZeroNetReady Workforce Development

Apprenticeships Collaboration

Behavioral Analysis Research

Alliances In Place

Statewide Collaboration: Coalition for Energy Efficiency

Informing the Utilities’ annual business plans and CPUC policy
Facility Management Initiative: Primary Research

Los Angeles, Orange, Riverside, and San Bernardino Counties
Facility Management Initiative: Statewide Advisory Council

Statewide License and Operating Agreement with IFMA for Essentials of Facility Management
HVACR Initiative: Primary Gap Analysis Research

Uncertainties in Achieving Energy Savings from HVAC Maintenance Measures in the Field, 2012

HVAC Educational Needs Assessment, 2012

Contractor HVACR & Technician Behavioral Study, 2015

HVACR Workforce Demand Heats Up as Supply Melts Away, 2015

2016 HVACR Contractors Survey, 2016

Workforce Barriers to Meeting California’s Energy Efficiency Mandates, 2016
HVACR Initiative: Primary Research Into Student Success

Attracting Students to the HVACR Skilled Trades: Barriers and Opportunities, 2016

Capturing the Value of HVACR Worker Certification, 2016

Curriculum Alignment Planning for HVACR Programs In California, 2016
HVACR Initiative:
Western HVAC Performance Alliance

Workforce Education & Training Committee Co-Chaired by the ECU Sector Navigator
HVACR Initiative:
Southern California HVAC Collaborative

Developing the model for HVACR workforce development
Automation Initiative
Primary Research & Proposals

Energy Skills
Collaborative

Industrial
Automation
Guided Pathways
Proposal

California Clean Energy Fund

ECU
Advanced Lighting Technology Initiative:
Skills Gaps Primary Research

Lighting Controls Training Assessment, 2016

Contractor Training Market Characterization, 2016
Energy Analytics & Auditing Initiative:
Primary Research - Entry Level

Market Opportunities for Entry Level Energy Auditors, 2016
Energy Analytics & Auditing Initiative: Advisory Council

Developing the statewide sector strategy
The Platform: Industry Informed
The Platform: Industry Informed
The Platform: Translation Into Regional Initiatives
The Platform: An Integrated Investment Strategy
The Platform: A Faculty Driven Process

Shared Vision

Higher Levels of Specialization

Stackable Certificates

Credit Transfer

Entry Level Jobs
Industry Valued Credentials
Internships
Common Outcomes
Foundational Knowledge

Example: So Cal HVAC Collaborative
## The Platform: Alignment of Student Learning Outcomes

<table>
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<tr>
<th>Competency</th>
<th>HVACRed</th>
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Competencies are benchmarked against an industry standard recommended by the Western HVAC Performance Alliance.

**Example: So Cal HVAC Collaborative**
The Platform: Stackable Credentials

Example: HVAC Career Pathways
The Platform: Customizable Solutions

ECUSectorDWM.com/Strong-Workforce  |  ECUSectorDWM.com/Key-Initiatives

The Platform: Mapped to State Energy Mandates

Mandates
“A trained and fully engaged workforce by 2020”

Market Drivers
SB 350 Clean Energy & Pollution Reduction
AB 802 Energy Use Benchmarking
Title 24 Building Energy Standards
AB 758 Existing Buildings Energy Efficiency

Capacity Gaps

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Competency Gaps
The Platform: Mapped to State Energy Mandates

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“A trained and fully engaged workforce by 2020”

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**Competency Gaps**

**Customizable Solutions**

**Energy Construction & Utilization**
California Community Colleges
Workforce & Economic Development
The Platform: Opportunities for Braided Funding

- **CEC Discretionary Funds**
- **CEC EPIC Funds $15M**
- **Utilities $30M**
- **WIOA Funds**
- **Strong Workforce**

- **CPUC Discretionary Funds**

Mapped to State Energy Mandates

- **Strong Workforce**
The Platform: Public-Private Partnership

Engage.

Enroll.

Employ.

Workforce Intermediary
Led by the LA City WDB

Quality Workforce
Led by ACCA and BOMA

Data Visualization
led by IDMLOCO

Focused Initially on HVACR
The Platform: Replication and Scaling
Timeline

Statewide
Regional
Pilot
Research


2018

HVACR Techs
Facility Managers
Bldg Energy Systems Pros
Building Automation Techs
Lighting Control Techs
Energy Auditors

HVACR
Strong Workforce Investment Opportunity

Facility Management
Strong Workforce Investment Opportunity

Building Energy Systems Professional
Strong Workforce Investment Opportunity

Automation
Strong Workforce Investment Opportunity

Advanced Lighting Technology
Strong Workforce Investment Opportunity

Energy Analytics & Auditing
Strong Workforce Investment Opportunity

A Design for Success

Engage.
Creating the Relationships Necessary for Success

Enroll.
Filling Classrooms with Likely Completers

Employ.
Connecting Students with Jobs, Launching Careers

- Industry
- Colleges
- Apprenticeship Programs
- Workforce Boards
- K-12
- Expert Networks
- Enrollment Strategy
- Career Awareness
- Outreach
- Identifying Likely Completers
- Serving Special Populations
- Employer Ecosystem
- Industry-Valued Credentials
- Student-Employer Linkages
- Work Experience
- “Branded” Channels
Engage.

Student Pool

Quality of Enrollment
Motivated Students
High Probability of
Completion

HVACR Career Pathway

Employability by Design
Alignment with Industry-Valued Credentials

Professional Development
HVACR Faculty Expert Network

Lab Upgrades
Evolving with Industry Trends

New Job Opportunities
Employer Ecosystem

Employ.

Shared Vision

Enroll.

Engage.
Engage. Higher Levels of Specialization
Stackable Certificates
Credit Transfer
Entry-Level Jobs
Industry-Valued Credentials
Internships
Common Outcomes
Foundational Knowledge

Faculty-Driven Process

Specialty Capstones
Multiple Colleges

Southern California HVACR Collaborative
Mt SAC
Cypress
LATTC
El Camino
College of the Desert

Common Outcomes
Foundational Knowledge
## Alignment of Student Outcomes

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### Engage.

- **Owner/Contractor**
  - CSLB, LEED AP

- **Energy Auditor**
  - LEED GA, ASHRAE

- **Entry-Level Engineer**
  - LEED GA, ASHRAE

- **HVACR Installation Technician**
  - RSES, EPA 608

### Enroll.

- **Product Manager**
  - LEED AP, ASHRAE

- **Energy Analyst**
  - LEED GA

- **Refrigeration Specialist**
  - RSES, EPA 608

- **HVACR Service Technician**
  - NATE & Excellence Specialties

### Employ.

- **Senior Engineer**
  - LEED AP, ASHRAE

- **Facility Manager**
  - CEM

- **High Performance Building Operator**
  - FMP, CFM, SFP

- **Control Systems Technician**
  - BOC

- **Plan Examiner**
  - PMI

- **Project Manager**
  - IAPMO, CEPE

- **Energy Manager**
  - CSLB, LEED AP, LEED AP, ASHRAE

### Specialties

- **CEA, CEM, LEED GA**
- **Energy Auditor**
- **Entry-Level Engineer**
- **HVACR Installation Technician**
- **Refrigeration Specialist**
- **HVACR Service Technician**
- **High Performance Building Operator**
- **Control Systems Technician**
- **Project Manager**
- **Energy Manager**

### Not Fully Vetted

- **Energy Auditor**
- **Entry-Level Engineer**
- **HVACR Installation Technician**
- **Refrigeration Specialist**
- **HVACR Service Technician**
- **High Performance Building Operator**
- **Control Systems Technician**
- **Project Manager**
- **Energy Manager**
Currently In Place Statewide
Recruiting Likely Completers

Video: Likely Completers for Zero Net Energy Careers
https://youtu.be/bWZvNDvpu9Q

Experiential Learning: Living Lab Tools for Faculty
http://www.chaffey.edu/livinglab

Applying Evidence-Based Recruiting Models

Primary Research

Examples
Improving Relevance for Careers

Hypothesis: Student retention and completion improvement through employment-ready experience

Enroll.

Prop 39
Investment @ $5M Annually

60 Colleges Statewide

Engage.

Enroll.

Employ.
Integrate Employers Into Recruiting

Employer Focus Group Findings¹

Employers want:
- A sustainable Talent Pipeline
- Joint commitment to quality completers
- Focused enrollment strategies
- Employer participation in recruiting
- Internships & externships
- Linkages (web portal) to candidates
- Direct access to students (class/lab)

¹ One HVACR and four Facility Management focus groups
CareerQuest

Break Down Barriers to Enrollment

Nearly 70% of potential enrollees fail to complete the application process!

CareerQuest provides a simple assessment tool to guide an enrollee to their ideal career pathway.

Career Navigators, available by phone or chat, walk the enrollee through the process all the way to getting a Student ID at their local college.
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Operating Agreement²

Commitment to:
- Statewide program leadership
- Annual program plan
- Regional advisory councils
- Joint recruiting and enrollment
- Internships and externships
- Evidence-based models/best practices
- Contribution to curriculum advances
- Job placement assistance

¹ One HVACR and four Facility Management focus groups
² Statewide operating agreement with IFMA advisory council
Cultivating a Regional Employer Ecosystem

Statewide Industry Partnerships

Talent Pipeline Development

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Summary of Investment Opportunities
Leverage for Regions and Colleges
Opportunity: Application Within Your Region

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The Platform: Customizable Solutions

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The Plan: Customizable Solutions

- Energy Construction
- Utility
- California Community Colleges
- Workforce & Economic Development
## Contacts: To Explore Opportunities

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<th>Contact</th>
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<td>North/Far North</td>
<td>Orion Walker</td>
</tr>
<tr>
<td>Bay Area</td>
<td>Carlos Santamaria</td>
</tr>
<tr>
<td>Central Valley / Mother Lode / Central Coast</td>
<td>Dave Teasdale</td>
</tr>
<tr>
<td>LA / Orange County</td>
<td>Bruce Noble, Larry McLaughlin</td>
</tr>
<tr>
<td>Desert / Inland Empire / San Diego / Imperial Valley</td>
<td>Jon Caffery</td>
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</tbody>
</table>

[http://ECUSectorDWM.com/Contact](http://ECUSectorDWM.com/Contact)
Thank You

James Morante
Sector Navigator
morantecomms@gmail.com
530-760-5270
ECUSectorDWM.com