Building a Clean Energy Workforce

Tuesday, June 9, 2020
11:00 AM
Madeline Salzman
U.S. Department of Energy
Agenda

1. Introduction/Housekeeping
2. Why Workforce Matters
3. Guest Speakers
4. Q&A Session
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Enter Event Code

#bbsummit
Poll #1: What area best describes your role (or your organization’s role) supporting the building energy workforce?

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Poll #2: What workforce topics/challenges are you most interested in?

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The mission of EERE is to create and sustain American leadership in the transition to a global clean energy economy. Its vision is a strong and prosperous America powered by clean, affordable, and secure energy.
Analysis for Strategy Development

Research & Development Funding Opportunities

Industry & Stakeholder Partnerships

Workforce Development Efforts
Today’s Presenters

Sarah Truitt  
National Renewable Energy Laboratory (NREL)

Dean Stanberry  
International Facility Management Association (IFMA)

Philip Jordan  
BW Research
Sarah Truitt
National Renewable Energy Laboratory (NREL)

Submit Questions
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### Who Is the Building Energy Efficiency Workforce?

#### Efficient Building Technology –

<table>
<thead>
<tr>
<th>Development</th>
<th>Integration</th>
<th>Installation</th>
<th>Diffusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research and Manufacturing</td>
<td>Architecture and Engineering</td>
<td>Construction and Facility Management</td>
<td>Services, Programs, Others</td>
</tr>
</tbody>
</table>

2.3+ Million Workers in Across these Industries in Efficiency Alone
Challenges Regarding the Building Energy Efficiency Workforce

- **Low Interest & Awareness**: 71% of students are “definitely or probably not” interested in HVAC careers (EGIA Foundation).
- **Confusing Pathways**: Building science credentials are fragmented and nontransparent in terms of suitability or quality (NREL).
- **Low Productivity**: Construction sector (new and retrofit) productivity is lagging and not digitized (McKinsey).
- **Lack of Diversity**: Women and African Americans are underrepresented in the U.S. efficiency workforce (USEER).
- **Lack of Efficiency Continuing Education**: 84% of efficiency employers report hiring difficulty for construction-related efficiency jobs (USEER).
- **Poor Quality Installation**: Without proper installation and maintenance, buildings can often waste up to 30% of energy (PNNL).

**Overarching**: Lack Energy Efficiency Workforce Identity. Most workers in the efficiency workforce primarily identify as other workforces – construction, manufacturing, services, etc.
Building Sector Forecasts & Trends

► Sustainable building is an emerging area of opportunity; 45% of commercial construction firms say sustainable building gives them a “competitive advantage” (U.S. Chamber of Commerce Commercial Construction Index)

► The United Nations predicts the square footage of New York City will be constructed in new buildings globally every 34 days for the next 40 years

► New housing starts in the U.S. are expected to be ~40% higher in 2028 than in 2020 (National Association of Realtors)

Source: National Association of Realtors
Buildings and Consumers are Changing

- Technologies are enabling buildings to be more effective at everything they do, including resource management and occupant comfort.
- Consumer preferences are moving towards more efficient, healthy and sustainable buildings.

“Gen Z is known for being mindful and health conscious, and they will actively seek opportunities to reduce their carbon footprint. As such, the generation will look for properties that make it easy to live ‘green,’ such as those that feature built-in support for electricity, water, and waste reduction.”

– Associated General Contractors of America (AGC)
The sector grew to 2.38M workers in 2019, up 2% from 2018.

Energy Efficiency Sector – Employment by Major Industry Sectors, Q2 2019

The “Energy Efficiency Sector” includes the production and installation of energy-saving products as well as the provision of services that reduce end-use energy consumption.

Occupations include manufacturing of ENERGY STAR®-labeled products, as well as building design and services that improve insulation and natural lighting and reduce overall energy consumption across homes and businesses.

Hiring Difficulty

Hiring is difficult across the energy efficiency sector, but more severe within the construction industry.

### Energy Efficiency Sector – Hiring Difficulty by Industry, Q4 2019

<table>
<thead>
<tr>
<th>Industry</th>
<th>Very difficult</th>
<th>Somewhat difficult</th>
<th>Not at all difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>45%</td>
<td>33%</td>
<td>22%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>46%</td>
<td>54%</td>
<td>5%</td>
</tr>
<tr>
<td>Wholesale Trade, Distribution</td>
<td>48%</td>
<td>41%</td>
<td>11%</td>
</tr>
<tr>
<td>Professional Services</td>
<td>50%</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>Other</td>
<td>59%</td>
<td>30%</td>
<td>11%</td>
</tr>
</tbody>
</table>

### Survey

<table>
<thead>
<tr>
<th>Survey</th>
<th>Construction Sector</th>
<th>Respondents Reporting Moderate to Severe Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>USEER</td>
<td>Energy Efficiency</td>
<td>91%</td>
</tr>
<tr>
<td>AGC</td>
<td>General Contracting</td>
<td>78%</td>
</tr>
<tr>
<td>U.S. Chamber</td>
<td>Commercial Construction</td>
<td>61%</td>
</tr>
</tbody>
</table>

Sources: Associated General Contractors of America (AGC) 2019 U.S. Chamber of Commerce 2019, 2020 U.S. Energy & Employment
Hiring Difficulty within the Building Energy Efficiency Sector

Top Reasons for Hiring Difficulty

► No. 1: Lack of experience, training or technical skills
► No. 2: Small applicant pool
► No. 3: Difficulty finding industry-specific knowledge, skills and interest


Results of an Untrained Workforce:
Efficiency installations that are slow, expensive, and low performing.
High-performance buildings and energy-saving technologies do not reach their potential.

Addressing Hiring Challenges

**Lack of Technical Skills**
- Incorporate more building science in existing training and education programs.
- Connect STEM education to building energy efficiency careers.

**Small Applicant Pool**
- Showcase building energy efficiency careers as exciting, impactful, and rewarding.
- Expand recruitment to broader populations of people.

**Lack of Industry-specific Skills**
- Map pathways to various building energy efficiency careers.
- Develop continuing education and on-the-job training programs for specific skills.
Low Interest and Awareness

- Negative perception of building industry careers
- Students do not associate exciting high-tech careers with the building industry
- Students lose interest in STEM subjects citing they are “too hard, boring, or not relevant to their career path”
- School counselors focus on college preparation rather than vocational career pathways

71% of students are “definitely or probably not” interested in HVAC careers.

Student Interest in HVAC Careers

Source: Electric & Gas Industries Association (2018)
Challenges to Overcome

Confusing Career Pathways

- Fragmented training landscape
- Not embedded in traditional career pathways or education system
- Varying requirements based on jurisdiction
- Difficult to assess suitability of programs for individual career aspirations

<table>
<thead>
<tr>
<th>“GREEN” CERTIFICATION OR DESIGNATION</th>
<th>GENERAL AUDIENCE</th>
<th>BUILDER/CONSTRUCTION WORKER</th>
<th>ARCHITECT/DESIGNER</th>
<th>REAL ESTATE (AGENT, LENDER, APPRAISER)</th>
<th>INSPECTOR/AUDITOR/RATER</th>
</tr>
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<tbody>
<tr>
<td>Blue House Energy Building Science Basics Certificate</td>
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<td>ASHRAE Certified Professional</td>
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<tr>
<td>Building Performance Institute Professional Certifications</td>
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<tr>
<td>Building Performance Institute’s Building Science Principles Certificate</td>
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<tr>
<td>BuildIt Green Certified Green Lender, Builder, Real Estate Professional</td>
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<tr>
<td>EarthAdvantage Accredited Green Appraiser and Green Broker</td>
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<tr>
<td>EcoBroker</td>
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<tr>
<td>Green Advantage Certified Associate or Practitioner</td>
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<tr>
<td>Green Professional Building Skills Training</td>
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<tr>
<td>GreenPoint Rater or Advisor</td>
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<tr>
<td>Home Energy Rating System (HERS) Rater</td>
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<tr>
<td>National Assoc. of Home Builders (NAHB) Certified Green Professional</td>
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<tr>
<td>National Assoc. of Realtors (NAR) Green Designation</td>
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<td>North American Technician Excellence (NATE)</td>
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<tr>
<td>Passive House Certifications</td>
<td>•</td>
<td>•</td>
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<tr>
<td>USGBC LEED Green Rater, Accredited Professional, Fellow</td>
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</table>
Challenges to Overcome

Lack of Diversity

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Employees</th>
<th>Percent of Sector</th>
<th>National Workforce Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1,767,865</td>
<td>75%</td>
<td>53%</td>
</tr>
<tr>
<td>Female</td>
<td>557,000</td>
<td>24%</td>
<td>47%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>365,427</td>
<td>16%</td>
<td>17%</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>1,959,438</td>
<td>84%</td>
<td>83%</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>32,553</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Asian</td>
<td>120,540</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>175,914</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>Native Hawaiian or other Pacific Islander</td>
<td>26,716</td>
<td>1%</td>
<td>&gt;1%</td>
</tr>
<tr>
<td>White</td>
<td>1,811,662</td>
<td>78%</td>
<td>78%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>157,460</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Veterans</td>
<td>235,384</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>55 and over</td>
<td>327,072</td>
<td>14%</td>
<td>23%</td>
</tr>
<tr>
<td>Union</td>
<td>251,785</td>
<td>11%</td>
<td>11%</td>
</tr>
</tbody>
</table>


![Construction Sector Demographics by Job Type](chart)

Source: U.S. Census Bureau (2018 data)
Opportunities to Overcome these Challenges Together

**Pipeline Stage**
- **K-12 Students**: Low Interest & Awareness
- **Higher Education & Training**: Lack of Diversity
- **Trainees & Apprentices**: Confusing Pathways, Lack of Efficiency Continuing Education
- **Efficiency Workforce**: Low Productivity
- **Quality Management**: Poor Quality Installation

**Identified Problem**
- Build Interest & Increase Awareness
- Clarify Competencies & Streamline Pathways
- Improve Skills & Process Feedback

**Proposed Methods**
- Define workforce and communicate benefits of these careers.
- Link educational pathways to competencies for careers with impact.
- Improve existing curricula and adoption of easy-to-install technologies.

**Central website resources, accredited efficiency education pathways, evaluated training programs and materials.**

**Better Buildings Workforce Accelerator**
Introducing a Better Buildings Workforce Accelerator

Work with national stakeholders to set and meet goals improve building science in training and educational programs.

**Accelerator Partners will**
- Establish a goal to –
  - increase awareness;
  - fill knowledge gaps; or,
  - streamline pathways
- Engage in partner cohort group
- Achieve recognition for setting goals and achieving milestones
- Enable tomorrow’s EE workforce

Accepting Better Buildings Workforce Accelerator Partners Today!

Get involved: email BBWorkforceAccelerator@nrel.gov
Discussion

How can DOE best support the development of the Building Energy Efficiency Workforce?

► Provide educational resources
► Convene like-minded organizations for peer learning
► Provide information on latest building technologies
► Recognize successful efforts
► Provide support (technical assistance) from national laboratory staff to review curricula or laboratory designs
► Other
Dean Stanberry
International Facility Management Association (IFMA)

Submit Questions
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INTERNATIONAL FACILITY MANAGEMENT ASSOCIATION

Empowering Facility Professionals Worldwide
23,600 Members in 108 Countries

IFMA is the world's largest and most widely recognized international association for facility management professionals.

Component Groups

IFMA provides exceptional focused component groups to address unique member-specific interests including:

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- Industry Councils (16)
- Interest Communities (6)
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No prerequisites - No renewal costs

FMP® Credential Program is the only tool you will need to earn your FMP® credential.

Once earned, you’re an FMP® for life, with an FMP® digital badge for easy online recognition and verification.

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Requires ongoing professional development and renewal every three years to ensure competency maintenance and FM proficiency

Validates holder as an experienced FM with demonstrated industry expertise
Maximize efficiencies and streamline operations to boost your triple bottom line: people, planet and profit

Learn to use knowledge-based, data-driven methods to drive decisions and develop valuable solutions

Gain recognition and credibility as an informed champion with a unique sustainability skill set.

No pre-requisites, no renewal costs and earn 30-70 general CE hours towards your LEED maintenance.
Learn and advance at every stage of your professional FM career

Increase your FM knowledge base, stay informed and ahead of industry trends

Discover proven solutions to help you anticipate and manage FM challenges

Why Professional Development Matters
## Investment in Time

<table>
<thead>
<tr>
<th>Course Name</th>
<th>Essentials of Facility Management®</th>
<th>Facility Management Professional® (FMP®)</th>
<th>Sustainability Facility Professional® (SFP®)</th>
<th>Certified Facility Manager® (CFM®) prepare with Facility Management Learning System™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Completion Time-Hours</td>
<td>2-4 Hours per Module</td>
<td>40-50 Study Hours; 10-12 Hours per Course</td>
<td>60-70 Study Hours; 20-23 Hours per Focus Area</td>
<td>75-100 Study Hours; 7-9 Hours per Competency</td>
</tr>
<tr>
<td>How Education Course Is Completed and Recognized</td>
<td>Complete 10 Assessments with a passing score. Receive a certificate of completion (not a credential).</td>
<td>Complete 4 Final Assessments with a passing score. Submit FMP® Application to IFMA. No expiration, no renewal.</td>
<td>Complete 3 Final Assessments with a passing score. Submit SFP® Application to IFMA. No expiration, no renewal.</td>
<td>Complete Pretests and Quizzes for 11 Core Competencies. Submit application, schedule Exam at a Prometric. Recertify in 3 years.</td>
</tr>
</tbody>
</table>
74% of organizations report that credentialed employees have higher performance appraisal ratings.

Average 5-year return on investment for individuals is **15:1** with a $6,000 salary increase within first year.
Why Facility Managers Need To Care
Buildings have been found to contribute 37 to 39 percent of energy consumption, which then leads to carbon emissions in energy development as well as energy use.
FREE Online Report

- Summarizes major scientific reports totaling over 3,000 pages
- Live links to references and resources
- Graphics to help demonstrate climate change impacts

Part II

• The second report in this series was released on April 21, 2020

• *Adapting to Climate Change for Facility Management Professionals* is available to download for free at IFMA’s Knowledge Library

https://bit.ly/34LiWJZ
Start Where You Are
Use What You Have
Do What You Can

Your world depends on it.
Philip Jordan
BW Research

Submit Questions
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BUILDING A CLEAN ENERGY WORKFORCE: COVID-19 IMPACTS
40 MILLION UNEMPLOYMENT CLAIMS SINCE MARCH

APRIL 2020 UNEMPLOYMENT RATE: 14.7%
Impact on the Energy Sector

1.3 Million Jobs Lost

Elimination of 5 Year Industry Growth
What is Not Included in the Data
Decline in Demand
Storage Nearing Capacity
On Track to Lose 1.75 Million Jobs
PROJECTED 25% LOSS IN WORKFORCE

Energy Efficiency
Renewable Electric Power Generation
Clean Vehicles
Clean Transmission, Distribution, & Storage
Clean Fuels

CLEAN ENERGY
LARGEST SECTOR, MOST LOSSES

Nationally:
413,500 Jobs Lost
March 2020: -4.4%
April 2020: -13.7%

Georgia: -30.3%
Hawaii: -26.2%
Kentucky: -26.1%
Alaska: -19.3%
Michigan: -18.1%
HOW DO WE DEAL WITH THIS UNPRECEDENTED CRISIS?
STIMULUS IDEAS

K-12
Commercial Office Spaces
Retail
Grid Infrastructure
Public Universities
Q & A

Submit Questions

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Additional Resources

Better Buildings Workforce Accelerator:
https://betterbuildingssolutioncenter.energy.gov/accelerators/workforce

Resources for Dealing with COVID-19 from Better Buildings partners, affiliates, and other organizations:
https://betterbuildingssolutioncenter.energy.gov/covid19
Better Buildings: Summer Webinar Series

**BEHIND THE METER DISTRIBUTED ENERGY RESOURCES:**
Best practices for integrating DERS into commercial buildings
July 8

**NEXT-GENERATION BUILDING PERFORMANCE POLICIES:**
Maximizing energy savings and environmental impacts
July 16

**EVERYONE HAS A DATA CENTER:**
How to be an energy champion for yours
July 28

**PROGRAM DESIGN WITH EVERYONE IN MIND:**
Low-income solar program strategies
July 9

**STRATEGIES TO COMBINE ENERGY + HEALTH UPGRADES IN MULTIFAMILY HOUSING**
July 21

**SUCCEED WITH SUBMETERING:**
How to make the business case
August 4

**THE DYNAMIC DUO:**
Unleash public sector energy savings with financing and technical assistance
July 14

**CASE IN POINT:**
Oregon's recent efforts to reduce plug load energy consumption
July 22

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