Better Buildings®
U.S. DEPARTMENT OF ENERGY

SUMMIT
A VIRTUAL LEADERSHIP SYMPOSIUM

MAY 17-20 2021

Learn more: betterbuildingssolutioncenter.energy.gov/summit
Madeline Salzman
U.S. Department of Energy
Agenda

1. Introduction/Housekeeping
2. Why Workforce Matters
3. Guest Speakers
4. Q&A Session
Please go to www.slido.com using your mobile device, or by opening a new window

Enter Event Code

#DOE
Poll 1: What sector are you from?

Submit Answers
www.slido.com event code #DOE
Poll 2: What workforce topics/challenges most interest you?

Submit Answers
www.slido.com event code #DOE
Better Buildings Workforce Accelerator
Better Buildings Workforce Accelerator

- Co-develop workforce development SMART goal with Accelerator Partners
- Participate in quarterly meetings & webinar presentations
- Publicize goals and progress toward them
- Recognize partners for successful efforts
- Develop case studies and shareable materials to replicate results
- Access to National Laboratories, academia, and expert consultants in the high-performance building and energy efficiency sectors

SMART Goal: Specific, measurable, attainable, realistic, time-bound goal that must pertain to one of the following:

- Increase **interest and awareness** of building energy efficiency careers nationwide
- Simplify and **streamline pathways** from education, training, and apprenticeship to careers
- Augment **existing education, training, and apprenticeship programs** to fill knowledge gaps and improve skill competencies
Existing Workforce Challenges

Goal. Ensure career pathways for a diverse and qualified building efficiency workforce that enable high performance buildings.

Negative Perception
- Lacking interest and awareness of careers among young people
- Women and Black Americans are underrepresented in workforce
- Showcase building energy efficiency careers as welcoming

Confusing Pathways
- Credentials are fragmented and nontransparent
- Sustainability trainings are often elective rather than foundational
- More extreme hiring difficulties among efficiency employers

Poor Quality Installation
- Improper installation leads to lacking trust in efficiency technology
- Sustainability & building science content is often ad hoc, not standardized
- Limited adoption of digital tools to streamline process
Strategies to Address Challenges

Goal. Ensure training pathways for a diverse and qualified building efficiency workforce that enable high performance buildings.

Build Interest
» Showcase building energy efficiency careers as welcoming, impactful, and rewarding.

Streamline Paths
» Clarify pathways for building efficiency careers. Add building science to established credentials.

Improve Skills
» Update continuing education. Increase use of digital tools to detect faults and manage performance.

Negative Perception

Confusing Pathways

Poor Quality Installation
## Participating Partners

### City & State Governments & Governmental Associations
- City and County of Denver, CO
- City of Longmont, CO
- City of Milwaukee, WI
- District of Columbia Sustainable Energy Utility (DCSEU)
- National Association of State Energy Officials (NASEO)
- New York State Energy Research and Development Authority (NYSERDA)
- Northeast Energy Efficiency Partnerships (NEEP)
- Northwest Energy Efficiency Council (NEEC)
- State of Mississippi Development Authority
- Solar Decathlon
- Veteran Administration VHA Energy Engineer Advisory Board

### Trade Associations & Union Organizations
- American Association of Blacks in Energy (AABE) & Jonah Cooper LLC
- American Society for Healthcare Engineering (ASHE)
- Association of Energy Engineers (AEE)
- Building Operators and Managers Association (BOMA)
- Building Performance Association (BPA)
- International Facility Manager Association (IFMA) Foundation
- National Association of Women in Construction (NAWIC)
- National Society of Black Engineers (NSBE)
- Network for a Sustainable Tomorrow
- North American Building Trades Union (NABTU)

### Colleges & Universities
- Auburn University, Rural Studio
- City University of New York: City College
- Lane Community College
- Roxbury Community College

### Nonprofits & Small Businesses
- ASHRAE
- Building Performance Institute (BPI)
- Confluence Communications
- The Corps Network
- Earth Advantage
- Emerald Cities Collaborative
- Energy & Environment Building Association (EEBA)
- Home Builders Institute
- Institute for Market Transformation High Performance Building Hub
- Interstate Renewable Energy Council (IREC)
- The Solar Foundation – Puerto Rico
- Strategic Energy Innovations
- Urban Green Council
- U.S. Green Building Council (USGBC)
Accelerator Commitments

- Developing **16** new workforce programs
- **16** partners targeting underrepresented communities
- Producing over **130** resources
- Training over **38,000** participants
- Distributing almost **20,000** surveys
- Outreach to over **450,000** people
Accelerator Highlights: First Six Months

- The **Institute for Market Transformation** launched their Building Innovation Hub to provide resources and content that prepare the workforce to support the District of Columbia’s Building Energy Performance Standard (BEPS). The content and information distribution model can also be scaled to other regions.

- The **Building Performance Association** launched a new webpage, “Connections: Trainings & Careers Hub” for residential high-performance contractors. This resource features an online community space, links to online courses and training, and career and resume advice.

- The **Energy and Environmental Building Alliance** offered over 84 online training sessions focused on sustainably constructing better homes in 2020, reaching 4200 participants and awarding 81 certifications.

- **Roxbury Community College** launched its new Certified Building Automation Technician Associate program, which included training 2 instructors and enrolling 13 students.
Accelerator Highlights

• **Interstate Renewable Energy Council (IREC)** developed a Green Building Career Map that provides guidance on necessary credentials and pathways between jobs and sectors.

• **The Corps Network** convened an Energy Efficiency Workforce Development Community of Learning to assist in the development of a curriculum and training program to prepare its members for entry-level jobs in energy efficiency, as identified in IREC’s Green Building Career Map.

• **City of Milwaukee** utilized technical assistance provided by University of Nebraska-Lincoln to effectively engage under-represented communities and connect them to energy efficiency job trainings, and identify gaps in green jobs categories.

• **The U.S. Green Building Council** created a new green building career site, featuring 18 occupations with a connection to the LEED certification program. Each career profile details education, training and certification requirements, as well as pathways and resources for pursuing each career.
Today’s Presenters

Erick Shambarger  
City of Milwaukee, WI

Aneysha Bhat  
Perennial Culture

Teresa Piazza  
Association of Energy Engineers

Roger Ebbage  
Lane Community College
Erick Shambarger
City of Milwaukee, WI

Aneysha Bhat
Perennial Culture

Submit Questions
www.slido.com event code #DOE
Building a Diverse and Energy-Efficient Workforce:

Accelerating Green Jobs in Milwaukee, WI

ERICK SHAMBARGER – DIRECTOR OF ENVIRONMENTAL SUSTAINABILITY, CITY OF MILWAUKEE, WI
ANEYSHA BHAT – CULTURE STRATEGIST, PERENNIAL CULTURE LLC
ECO’s Mission

- Make Milwaukee a world class eco-city on America’s Fresh Coast.
- Develop practical solutions that improve people’s lives and the economy.
- Protect and restore the natural eco-systems that are integral to our long-term prosperity.
- Develop community and global partnerships
- Implement award-winning programs and the City’s Refresh Milwaukee sustainability plan.
- Currently developing a Climate and Equity Plan to dramatically reduce greenhouse gas emissions while creating new jobs that include marginalized communities and communities of color
Role of ECO in Green Jobs

• ReFresh Milwaukee Sustainability Plan
  • Every Chapter asks how sustainability strategies support job creation

• With limited financial resources, we work on policy and market-based solutions to increase our impact.

• ECO is not a workforce development agency. However, we leverage our influence to support green job development.

• ECO’s participation in the US Department of Energy’s Better Buildings Workforce Accelerator is currently our primary formal green jobs initiative
Three Year Effort to support energy efficiency workforce in buildings.

DOE provides technical assistance and connections with a national community of practitioners

<table>
<thead>
<tr>
<th>Build Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Showcase building energy efficiency careers as welcoming, impactful, and rewarding.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Streamline Paths</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Clarify pathways for building efficiency careers. Add building science to established credentials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improve Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Update continuing education. Increase use of digital tools to detect faults and manage performance.</td>
</tr>
</tbody>
</table>
Workforce Accelerator: Local Goals - 3 Years

- Develop and publicize clear pathways for new workers to enter and have success in the energy efficiency workforce.

- Focus our efforts with economic equity in mind

- Target of helping at least thirty people of color find secure work in this sector with family supporting wages

- Supporting an improved and diversified energy efficiency workforce beyond the project period

- Support careers with family-supporting wages

- Electricians are anticipated to be a high growth occupation
Workforce Accelerator: Local Partners

- Employ Milwaukee
- Milwaukee Area Technical College
- City Clerk’s Workforce Development Coordinator
- Community Advocates Public Policy Institute
- Milwaukee Area Labor Council
- Milwaukee Metropolitan Sewerage District
O*NET Data is Helpful

- Pulled Labor Market Information (LMI) from ONET codes provided by US DOE
- A substantial amount of total jobs with mostly positive growth rates by 2030
- Currently, most jobs are filled by an aging, white, male workforce
- Wages are for the most part family-supporting, pointing to a lot of opportunity

<table>
<thead>
<tr>
<th>SOC</th>
<th>Description</th>
<th>2020 - 2030 % Change</th>
<th>Avg. Annual Openings</th>
<th>Median Annual Earnings</th>
<th>2020 Turnover Rate</th>
<th>Typical Entry Level Education</th>
<th>Typical On-The-Job Training</th>
<th>Males % of Occupation</th>
<th>Total Diversity % of Occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>47-2111</td>
<td>Electricians</td>
<td>10%</td>
<td>488</td>
<td>$71,606.40</td>
<td>50%</td>
<td>High school diploma or equivalent</td>
<td>Apprenticeship</td>
<td>98%</td>
<td>11%</td>
</tr>
<tr>
<td>47-2152</td>
<td>Plumbers, Pipefitters, and Steamfitters</td>
<td>7%</td>
<td>290</td>
<td>$69159.80</td>
<td>47%</td>
<td>High school diploma or equivalent</td>
<td>Apprenticeship</td>
<td>99%</td>
<td>11%</td>
</tr>
<tr>
<td>11-3011</td>
<td>Administrative Services and Facilities Managers</td>
<td>0%</td>
<td>209</td>
<td>$115,498.89</td>
<td>40%</td>
<td>Bachelor's degree</td>
<td>None</td>
<td>59%</td>
<td>15%</td>
</tr>
<tr>
<td>49-9021</td>
<td>Heating, Air Conditioning, and Refrigeration</td>
<td>8%</td>
<td>174</td>
<td>$59,604.99</td>
<td>39%</td>
<td>Postsecondary nondegree award</td>
<td>Long-term on-the-job training</td>
<td>99%</td>
<td>10%</td>
</tr>
</tbody>
</table>
Green Jobs in Milwaukee

• MATC is a pathway to many trades and green jobs

• The Wisconsin University system has expanded offerings in water and energy technology

• The Midwest Renewable Energy Association provides training in solar energy

• Trade unions like IBEW provide training and pathways
U.S. DOE provided technical assistance through our involvement in the Workforce Accelerator

Milwaukee is developing a plan to support a off-site housing construction factory to address the intertwined challenges of affordable housing, jobs, and climate change

Milwaukee is coordinating with DOE’s Advanced Building Construction (ABC) initiative on the project

DOE Milwaukee with Dr. Kevin Grosskopf from the University of Nebraska-Lincoln who developed a roadmap for a training program for the prospective facility based on successful programs nationally
Building a Green Jobs Pathway Map in Milwaukee, WI

The Objective: To clarify green job pathways in Milwaukee, by matching national energy efficiency/green job maps with local training providers.

Create a unified website to educate job seekers on entry-level green job categories and relevant training institutions.
Information Collection Process

Interviewed several individuals from the City/County Task Force on Climate Change and Economic Equity’s Jobs & Equity Working Group about the scope of training programs currently offered

Table 2: Detailed Overview of Key Findings

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Training Offered</th>
<th>Targeted Population</th>
<th>Outcome of the training process</th>
<th>Requirements for trainees</th>
<th>Barriers to entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>City/County Task Force</td>
<td>Fresh Coast Fresh Start</td>
<td>30 people placed in green-collar jobs</td>
<td>Participants reported increased knowledge and skills</td>
<td>- Completion of training program</td>
<td>- Limited access to job opportunities</td>
</tr>
<tr>
<td>City/County Task Force</td>
<td>New Path program</td>
<td>20 people placed in green-collar jobs</td>
<td>Participants reported increased knowledge and skills</td>
<td>- Completion of training program</td>
<td>- Limited access to job opportunities</td>
</tr>
</tbody>
</table>

COVID-19 pandemic affected plans for in-person training programs due to social distancing and quarantine measures.
Current Career Maps

Green Buildings Career Map

Solar Career Map
The Deliverable

Using inspiration from the DOL website, listing profession, training, and opportunity for certification or license:

www.careeronestop.org/GreenCareers

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Education &amp; Training</th>
<th>Certification</th>
<th>License</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilermakers</td>
<td>High school diploma or equivalent</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Electrical Engineers</td>
<td>Bachelor’s degree</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Electrical Power-Line Installers and Repairers</td>
<td>High school diploma or equivalent</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Energy Auditors</td>
<td>Bachelor’s degree</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

The Goal:
- To be integrated in a website, user-friendly format
- To be accessible on multiple platforms, integrated on the City of Milwaukee’s website

<table>
<thead>
<tr>
<th>Field</th>
<th>Occupation</th>
<th>Training</th>
<th>Training Provider</th>
<th>Certificate</th>
<th>Diploma</th>
<th>Degree</th>
<th>Eligibility</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Efficiency: Building Operation &amp; Facility Management</td>
<td>Building Operator</td>
<td>Automated Building Systems (ABS)</td>
<td>Milwaukee Area Technical College (MATC)</td>
<td></td>
<td>✓</td>
<td></td>
<td>MATC acceptance requirements (General understanding of math; high school Algebra Transcript)</td>
<td>MATC ABS Program Information</td>
</tr>
<tr>
<td>Solar Installation</td>
<td>Solar Professional</td>
<td>Solar Training Academy</td>
<td>Midwest Renewable Energy Association (MREA)</td>
<td></td>
<td></td>
<td></td>
<td>MREA program acceptance/educational requirements</td>
<td>Solar Training Academy Information</td>
</tr>
<tr>
<td>Field Electrician</td>
<td>Field Electrician Apprentice</td>
<td>IBEW Apprenticeship Program</td>
<td>International Brotherhood of electrical Workers (IBEW)</td>
<td>✓</td>
<td></td>
<td></td>
<td>IBEW Apprenticeship Information</td>
<td></td>
</tr>
</tbody>
</table>

The Goal:
- To be integrated in a website, user-friendly format
- To be accessible on multiple platforms, integrated on the City of Milwaukee’s website
Teresa Piazza
Association of Energy Engineers (AEE)

Submit Questions
www.slido.com event code #DOE
Leading the Way to a Diverse and Qualified Workforce

Teresa J. Piazza, AEE Training Director
About AEE

• Founded in 1977
• Nonprofit Professional Society
  • Over 18,000 members in 100+ countries
• “To promote the scientific and educational interests of those engaged in the energy industry and to foster action for Sustainable Development”
Efforts in Developing a Diverse & Qualified Workforce

- Certification
- Diversity & Inclusion Efforts
  - Two priority programs
- Additional outreach and capacity building efforts
AEE Certifications

• 15+ Certifications Offered
• 32,000+ Currently Certified Professionals
AEE Certifications

Why Get Certified?
• Develop capability
• Create customer affinity
• Maintain a competitive edge

Why AEE?
• Certifications developed for the industry, by the industry
• Gain access to a global network
• Helping build communities worldwide
• Supporting a sustainable energy future
Diversity & Inclusion: Council on Women in Energy & Environmental Leadership

• Council on Women in Energy & Environmental Leadership
• Equal by 30 Signatory
Diversity & Inclusion:

- Goal for Better Building Workforce Accelerator: Increase membership by 25%
  - Chapter liaisons: Increase from 12 to 36 in one year
  - Webinar series on Career Advancement and Gender Diversity
  - All-female authored journal
Diversity & Inclusion: Underrepresented Minorities

• Goal: Develop & deliver program to encourage underrepresented minorities to join AEE and build a career in energy efficiency
  • Focusing on colleges and universities
  • Creating materials for orientation programs into energy engineering
  • Partnering with our corporate members to develop, communicate, and promote career pathing, internships, etc.
Better Buildings Summit

Additional Outreach & Capacity Building

• Journals
• Career Hub
• Mentoring
• Scholarships through AEE Foundation
• New Trainings
Additional Outreach & Capacity Building

• Journals
• Career Hub
• Mentoring
• Scholarships through AEE Foundation
• New Trainings
Additional Outreach & Capacity Building

• Journals
• Career Hub
• Mentoring
• Scholarships through AEE Foundation
• New Trainings
Additional Outreach & Capacity Building

• Journals
• Career Hub
• Mentoring
• Scholarships through AEE Foundation
• New Trainings
Additional Outreach & Capacity Building

• Journals
• Career Hub
• Mentoring
• Scholarships through AEE Foundation
• New Trainings
Thank you!
Lane Community College
Energy and Water Efficiency Program

Building Energy and Controls Apprenticeship Program (BECA)

Better Building, Better Plants Summit
May 20, 2021
Building Energy and Controls Apprenticeship Program (BECA)

• Why a DOL Approved Apprenticeship Program?
• What are the BECA Components?
• How does BECA Work?
Building Energy and Controls Apprenticeship Program (BECA)

• Why a DOL Registered Apprenticeship Program (RAP)?

The Challenge is to Develop a Diverse Better Buildings Workforce

The Problem is that Energy Managers and Controls Technicians are Behind the Curtain!
Think Wizard of OZ. Energy Savings Plus Comfort – Oh My!!!

Students are not Usually Offered Energy Management and Controls Technology as a Career Option by:
High School Career Counselors,
Employment Developers, or
Veterans Employment Sources
Building Energy and Controls Apprenticeship Program (BECA)

• What are the BECA Components?

  • Related Training
    • The Online Energy Management Two-year AAS Degree Program

  • Paid, On-the-Job (OJT) training – 2000 hours!
    • OJT is Facilitated by Training Agents who Operate Buildings and are Willing to Train Apprentices!

• Cumulative Exam
  • The Association of Energy Engineers (AEE) ANSI 17024 CEM Exam
Building Energy and Controls Apprenticeship Program (BECA)

• How does BECA Work?
  • Students Enroll in The Lane Energy-Controls Degree Program Fall 2021 Launch
  • Must Complete the 1st Year of the Program to Qualify for OJT Hours Beginning Summer Term
  • CEM Exam upon Completion of Degree program and OJT
Measurable Outcomes!

1. Wide range of students served, both in terms of geography and student demographic.
2. Increased number of practitioners with energy efficiency education and work-experience.
3. New method of energy education delivery for entry-level practitioners
4. Training Agents have a hand in training potential employees
5. The World Will Survive!!!
Lane Community College  
Energy and Water Efficiency Program  
Building Energy and Controls Apprenticeship Program (BECA)  

Roger Ebbage  
ebbager@lanecc.edu  
541.556.7724  

Better Building, Better Plants Summit  
May 20, 2021
Submit Questions
www.slido.com event code #DOE
Additional Resources

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

Better Buildings Workforce Development Portal
https://betterbuildingssolutioncenter.energy.gov/workforce
<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrifying Our Buildings: Challenges and Solutions</td>
<td>June 8</td>
</tr>
<tr>
<td>Financing in Higher Education</td>
<td>June 22</td>
</tr>
<tr>
<td>Kick the Tires: Understanding the Role of R&amp;D in the Deployment of Building Energy Technologies</td>
<td>July 6</td>
</tr>
<tr>
<td>Energy-Saving Envelope Success Stories</td>
<td>July 27</td>
</tr>
<tr>
<td>Becoming ESPC-Ready</td>
<td>June 15</td>
</tr>
<tr>
<td>What’s Hot with Heat Pumps</td>
<td>June 29</td>
</tr>
<tr>
<td>ESPC in the Express Lane: New Project Tracking Tools</td>
<td>July 13</td>
</tr>
<tr>
<td>Waste Reduction: Lessons Learned and What Comes Next</td>
<td>August 3</td>
</tr>
<tr>
<td>Boosting Industrial and Manufacturing Efficiency and Resiliency with CHP</td>
<td>June 17</td>
</tr>
<tr>
<td>How to Identify CHP Projects That Fit Your Goals</td>
<td>July 1</td>
</tr>
<tr>
<td>Workplace Evolution: Supporting Occupant Health While Achieving Energy Efficiency</td>
<td>July 20</td>
</tr>
<tr>
<td>Visualize Your Energy Future with ‘Slope’: The State and Local Planning for Energy Platform</td>
<td>August 10</td>
</tr>
</tbody>
</table>

https://betterbuildingssolutioncenter.energy.gov/events-webinars
Additional Questions?

Please Contact Us

Follow us on Twitter
@BetterBldgsDOE

Better Buildings Solution Center
https://betterbuildingssolutioncenter.energy.gov/

General Inquiries
BetterBuildings@retechadvisors.com

Program Support
ksanderson@retechadvisors.com

Erick Shambarger
City of Milwaukee, WI
eshamb@milwaukee.gov

Aneysha Bhat
Perennial Culture
aneysha@perennialculture.com

Teresa Piazza
Association of Energy Engineers (AEE)
Teresa@aeecenter.org

Roger Ebbage
Lane Community College
ebbager@lanecc.edu

Madeline Salzman
U.S. Department of Energy
Madeline.Salzman@ee.doe.gov