Moderator: Dr. Debra Rowe
Director Higher Education Associations Sustainability Consortium

Dr. Kenneth A. Walz,
Science and Renewable Energy Instructor
Madison Area Technical College

Andrea Leuke, President and Executive Director, The Solar Foundation

Larry Zarker, CEO, Building Performance Institute

Dr. Jerry Weber, Director, SEED Center
Clean Energy Careers and the National Science Foundation
Advanced Technological Education Centers

Kenneth A. Walz,
Madison Area Technical College
Clean Energy Jobs:

1) Pay a family supporting wage
2) Cannot be outsourced
3) Cannot be done by robots
4) Benefit society

Fastest Growing Occupations

Fastest growing occupations: 20 occupations with the highest percent change of employment between 2018-28.

Click on an occupation name to see the full occupational profile.

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>GROWTH RATE, 2018-28</th>
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<td>$24,200 per year</td>
</tr>
<tr>
<td>Personal care aides</td>
<td>36%</td>
<td>$24,020 per year</td>
</tr>
<tr>
<td>Occupational therapy assistants</td>
<td>33%</td>
<td>$60,220 per year</td>
</tr>
</tbody>
</table>
Renewable energy costs hit new lows, now cheapest new power option for most of the world

Phil Dzikiy - May 29th 2019 2:54 pm ET @phildzikiy
CISA Identifies Critical Workers Amidst COVID-19 Pandemic
Clean Energy Technology NSF ATE Centers

Center for Renewable Energy Advanced Technological Education
Madison College, Madison WI
www.CreateEnergy.org

Building Efficiency for a Sustainable Tomorrow
Laney College, Oakland, CA
www.BestCtr.org

Regional Center for Nuclear Education and Training
Indian River State College, Fort Pierce, FL
www.GoNuke.org
NSF Advanced Technological Education Program
- Building a Skilled Technical Workforce
- Emphasis on Two Year Technical and Community Colleges
- $66M in FY19 funding and over 300 active grant awards

NSF ATE Centers
- Curriculum and Program Development
- Faculty Professional Development
- Academic and Industry Partnerships
- STEM Career Pathways
- Networking/Mentoring/Communities of Practice

www.ATECenters.org
Let’s see a few examples of some clean energy educational programs
The Northwest Water & Energy Education Institute (NWEEI) at Lane Community College provides degrees in the energy and water industry throughout the Pacific Northwest and Northern California.

- One of the earliest energy programs in the U.S.
- Delivered in a 100% online format with flexible scheduling
- Real world hands-on experience with field mentors
- Embedded industry credentials (AEE CEM)
- www.NWEEI.org
Renewable Energy Certificate Program

- Program launched in 2005
- Augments academic degrees or work experience in traditional fields
- 9 to 12 credits
- Hybrid instructional delivery
- https://MadisonCollege.edu/program/renewable-energy
Sustainable Technology
Green Buildings
Renewable Energy
https://www.cccc.edu/sustainability/

Clean Energy Technology
https://www.shoreline.edu/programs/clean-energy-technology/

Energy Management
https://www.dtcc.edu/academics/programs-study/energy-management/
Solar Ready Vets Fellowship

Through the Solar Ready Vets Fellowship Program, service members from select military bases will be placed into 12 week on-the-job training fellowships with solar employers to facilitate their transition from active duty to civilian careers in the solar industry. This initiative will be part of the successful Hiring Our Heroes Corporate Fellowship program. Service members will come from select military bases in regions with high demand for solar workers.

The fellowship program will be focused mainly on management and professional roles, such as technical sales, system design, supply chain logistics, project development, and operations, in addition to installation. Through placement with industry employers, service members will receive valuable on-the-job training, professional development, and career guidance.

We are currently building a team of solar industry employer partners to host fellows. To learn more about how your company can get involved, sign up at AmericanSolarWorkforce.org.

Solar Opportunities and Readiness (SOAR) Initiative

The SOAR Initiative is leading the way to expand solar career opportunities for veteran populations. Through partnerships among solar companies, training providers, and workforce development networks in high-demand markets, this initiative connects veterans with solar credentialing and professional development opportunities.

Our team is pursuing efforts to:

- Establish an industry-recognized apprenticeship program for greater standardization in work-based learning at solar companies.
- Expand the eligibility of GI Bill benefits for solar training programs and certification exam costs.
- Define “fast-track” pathways to abbreviate NABCEP PV certification requirements based on military experience and qualifications.
- Connect veterans nationwide to appropriate education, credentialing and employment opportunities.
Interested in getting involved with the NSF ATE Community?

Mentor Up

MENTOR LiNKs
ADVANCING TECHNOLOGICAL EDUCATION
Thank you for your attention!

Questions?

Disclaimer: This work is supported in part by NSF ATE grant awards 1600934, 1800893, 1901852, and 2000714. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
Resources and Solutions for Solar Industry Workforce Development

Andrea Luecke
President and Executive Director
The Solar Foundation
October 8, 2020
THE SOLAR FOUNDATION

RESEARCH
Original, objective research on solar jobs, economic impacts, and workforce development trends.

CAPACITY BUILDING
Educational outreach and technical assistance to expand solar energy use. We’ve helped over 370 local governments in 41 states make it faster and easier to go solar.

WORKFORCE DEVELOPMENT
We lead partnerships between industry, educational institutions, and communities to build a skilled & diverse solar workforce.

Solar Jobs Research
Solar-Powered Communities
Solar Career Pathways
National Solar Jobs Census

SOLAR ENERGY
PROVIDING AMERICAN
JOBS IN ALL 50 STATES

249,983
WORKERS SPENT THE MAJORITY OF THEIR TIME
ON SOLAR-RELATED WORK IN 2019.

NATIONAL SOLAR JOBS CENSUS 2019
SolarJobsCensus.org
Hiring Difficulty in a Growing Industry

26% of all solar employers & 33% of installers & project developers said it was “very difficult” to hire qualified employees.
Strengthening & Expanding the Workforce

🌟 **Tools & Resources**
- for strategic solar workforce development

🌟 **Industry-Education Partnerships**
- for a job-ready solar workforce

🌟 **Solar Career Connections**
- for diverse career pathways
The Workforce Development Toolkit

PART 1: THE WORKFORCE DEVELOPMENT SYSTEM
LEVERAGING NETWORKS AND RESOURCES

WORKFORCE DEVELOPMENT ACTION PLAN
Below is an industry-driven action plan that outlines specific high-level actions business owners and hiring managers can take to address their hiring and training needs. Each action is a jumping-off point that will require additional planning with local partners to identify resources, timelines, and the level of priority. Each action can take place in any sequence or concurrently, depending on the resources and time available. Use this tool to start a discussion with other businesses or workforce development partners in the region. By increasing collaboration among workforce development stakeholders on multiple fronts, solar businesses and the workforce system can find innovative solutions to complex staffing challenges.

The action plan also includes a few specific actions for workforce development partners and education providers to support industry-driven solutions. Business-driven solutions can and should be supported in the strategy. Take this action plan to the local workforce development board or community college and invite them to join the solar industry in addressing workforce development needs.
Solar Training at Community Colleges

About 200 community colleges across the country currently offer solar training.

Some are Associate Degree programs focused entirely on solar and renewable technologies.

Others include solar in the curriculum for more traditional electrical and construction training.
Solar Training and Career Paths

IREC Solar Career Map

https://www.irecsolarcareermap.org/
Solar Certification Through NABCEP

Value of Certification
✓ Increased marketability
✓ Validation of knowledge
✓ Enhanced professional credibility

A NABCEP-certified installer salary is typically $11,000 more than the non-certified solar installer

60% of EPCs consider NABCEP Board Certifications “essential” or “very important” when hiring.
The Solar Ready Vets Network strengthens solar career pathways and advances a nationwide pipeline of military talent into all levels and sectors of the solar industry.
A Solar Ready Vets Partnership

Tidewater Community College (based in Norfolk, VA) has teamed up with Strata Solar to encourage training opportunities and career development for military veterans in the solar industry.
We can work with you on partnership opportunities and ways to integrate solar into your workforce offerings.

Learn more about solar workforce development and access our resources at AmericanSolarWorkforce.org.

Contact me to learn more about how we can work together.

Andrea Luecke
President and Executive Director
aluecke@solarfound.org
Emerging Job Opportunities in Energy Efficiency and Climate Resilience

Larry Zarker, CEO
Building Performance Institute
lzarker@bpi.org
(202) 256-3893 (direct)
Industry Crisis: Aging Workforce

- Trade industries seeing a shortage of individuals entering the workforce
- Connecticut stepped up to address the issue at the technical high school level
- Community colleges are well positioned to train the next generation workforce
BPI’s Role in Workforce Development

• Founded in 1993, BPI develops technical professional standards and certifications relating to the comfort, health, safety, durability and energy efficiency of homes

• BPI goes to market through a national network of 110 BPI Test Centers
“What saved hundreds of billions of dollars in energy costs AND prevented emissions from being 60% higher? Energy efficiency, of course.” Pat Stanton, E4TheFuture
Community Colleges Embrace BPI Certifications

**BPI Building Analyst and Envelope Certifications**
Northern Essex Community College

**PROGRAM INFO**
Northern Essex Community College offers both BPI Building Analyst and Envelope Shell Training and Certification Courses. In addition, students may opt to combine the two levels at reduced time and cost. Since the skills are transferable, the training and certification can be valuable not just for energy auditors, but also for anyone involved in weatherization, insulation, HVAC, home construction, home inspection, air quality and design. Anyone can become a BPI Certified Building Analyst; there are no prerequisites.

BPI Building Analyst field certification testing for experienced energy auditor professionals or students with sufficient preparation. It is suitable for existing Building Analysts needing re-certification. The testing includes all applicable BPI administrative fees, a suitable field test location, use of diagnostic equipment, and BPI proctoring services. The individually proctored field test takes two hours. This module ONLY includes the Building Analyst FIELD certification exam. BPI certification candidates must register separately for the Building Analyst written test and/or for any instruction.

Offered multiple times per year at field locations in New Hampshire.

Check the [Energy Training Schedule](#) for information about dates, location, registration and tuition.

- Fast-Track BPI Building Analyst Review (NCWK 9036L)
- Building Science Principles (NCWK 9043L)
- Infiltration and Duct Leakage BPI Certification Testing (NCWK 9044L)
State Program Workforce Development Initiatives Focus on Energy Efficiency and Renewable Energy

PUTTING CALIFORNIA ON THE HIGH ROAD

A JOBS AND CLIMATE ACTION PLAN FOR 2030
JUNE 2020
At Least One BPI Core Certification Prerequisite

Core BPI Certifications
- Building Analyst
- MF Building Analyst
- QC Inspector
- Energy Auditor

Certificates of Knowledge
- Building Science Principles
- Healthy Housing Principles
Announcing...

Building Science Principles Reference Guide
Second Edition

Healthy Housing Principles Reference Guide
First Edition
## Healthy Housing Principles

### Target Audiences

<table>
<thead>
<tr>
<th>Clean</th>
<th>Building Performance Institute, Inc.</th>
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</thead>
<tbody>
<tr>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>Pest-Free</td>
<td></td>
</tr>
<tr>
<td>Contaminant-Free</td>
<td></td>
</tr>
<tr>
<td>Safe</td>
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</tr>
<tr>
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<tr>
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</tr>
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*Healthy Housing Principles Reference Guide*

*First Edition*
Healthy Housing Principles
Target Audiences

- Weatherization Technicians
- HVAC Technicians/Office Staff
- Insulation/Air Sealing Technicians
- Home Performance Contractors
- Community Health Workers
- Public Health Workers
- In-Home Nurses
- Nurse Practitioners
- Utility Program Representatives
- Home Inspectors
- Realtors
- Parent Teacher Advocacy
- Students
  - Technical High School
  - Community College
Terms Gaining Classroom Credibility:

- Climate Resilience
- Sustainable Housing Systems
- Decarbonization
- Energy Equity
Climate Change Paths of Destruction

- Stronger and More Catastrophic Hurricanes
  - Higher Winds
  - Major Flooding
- More Severe Wildfires
- Cycles of Droughts & Flooding Affecting Agriculture
- Major Health Related Human Impacts
Climate Change Impacts on U.S. Budget

Over the last two years, the U.S. federal government has paid out over $220 billion in home insurance claims resulting from wildfires, hurricanes, and other natural disasters – more than the previous 20 years combined.
Scientists nearly double sea level rise projections for 2100, because of Antarctica

Scientists behind a new study published in the journal Nature used sophisticated computer models to decipher a longstanding riddle about how the massive, mostly uninhabited continent surrendered so much ice during previous warm periods on Earth. They found that similar conditions in the future could lead to monumental and irreversible increases in sea levels. If high levels of greenhouse gas emissions continue, they concluded, oceans could rise by close to two meters in total (more than six feet) by the end of the century. The melting of ice on Antarctica alone could cause seas to rise more than 15 meters (49 feet) by 2500.

Implications?
• 1.9 million homes destroyed
• $882 billion in property damage
• California, Florida, New Jersey, Massachusetts and Virginia most affected
How do we safeguard our nation’s 134 million homes?

- It takes a community (e.g., microgrids)
- Community solar systems
- Need for house-as-a-system thinking
- Wind, water, flame resistant systems
- Rainscaping systems for effective drainage
- Massive workforce development needed
- Need trades training and certifications to overcome the silos
Comments? Questions?

Contact Me at:
Larry Zarker
lzarker@bpi.org
(202) 256-3893 (direct)
National support for community colleges in building a green campus and a sustainable, just economy
The Time is Now …

- Incorporate promising practices and curricula into existing or new green workforce programs
- Develop and engage faculty
- Partner with employers in the community
# Fastest Growing Jobs in America

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# Solar Photovoltaic Installer

## Quick Facts: Solar Photovoltaic Installers

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<tr>
<td><strong>2019 Median Pay</strong></td>
<td>$44,890 per year</td>
</tr>
<tr>
<td><strong>Typical Entry-Level Education</strong></td>
<td>High school diploma or equivalent</td>
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<tr>
<td><strong>Work Experience in a Related Occupation</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>On-the-job Training</strong></td>
<td>Moderate-term on-the-job training</td>
</tr>
<tr>
<td><strong>Number of Jobs, 2018</strong></td>
<td>9,700</td>
</tr>
<tr>
<td><strong>Job Outlook, 2018-28</strong></td>
<td>63% (Much faster than average)</td>
</tr>
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</table>
What is the SEED Center?

Leadership Initiative

Resource Center

Sharing Community

480+ Presidents of Community College have signed on to SEED
How can the SEED Center Help Your College?

**Sharing Community**

*Toolkits and Guides* to help college leaders implement clean energy education and campus sustainability initiatives.

**Resource Center**

*1000+ Curricular Resources & Promising Practices* curated by industry and agency experts

[https://www.ncwe.org/page/projects](https://www.ncwe.org/page/projects)
Connecting Clean Energy to Positive Change

- Jobs that hedge against AI and technology disruption

- Reaching out to include communities of color in the clean energy workforce
SOLAR TRAINING NETWORK

Strengthening the Solar Workforce through Education and Career Connections.