The Business Council & NYSERDA Webinar Series:

Workforce Development and Training

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Melody Baglione  Cooper Union

March 28, 2019
What is a Clean Energy Job?

All employees from qualifying clean energy firms that spend any portion of their time supporting clean energy products and services.

Job Growth: New York’s clean energy economy continues to see stronger job growth than the State’s economy overall.

- Clean energy employment grew by 3.9% from 2016 to 2017.
- Overall NY employment grew 1.7% in that time.
Clean Energy Jobs Landscape

New York’s nation leading policies are fueling job growth

nearly 152k clean energy jobs across New York State at the end of 2017

3.9% growth of clean energy jobs in 2017 double the statewide average

CLEAN ENERGY EMPLOYMENT BY TECHNOLOGY
(number of jobs, December 2017)

117,000 Energy Efficiency

22,000 Renewable Electric Power Generation

7,800 Alternative Transportation

2,500 Renewable Fuels

1,500 Grid Modernization and Storage
Clean Energy Jobs Landscape

Employers see plenty of applicants, but often not with desired qualifications.

The occupations employers find hardest to hire for are:

> Technicians
> Sales, marketing, and customer service staff
> Engineers

Reasons for Hiring Difficulty Reported by Employers

- Lack of experience, training, or technical skills: 51%
- Insufficient non-technical skills (work ethic, dependability, critical thinking): 34%
- Insufficient qualifications (certifications or education): 26%
- Competition/ small applicant pool: 20%
- Cannot provide competitive wages: 11%
- Cannot pass employment screening: 9%
- Economy/structural problem: 6%
- Other: 3%
- Cultural fit: 3%
- Location: 3%
- Difficulty finding industry-specific knowledge, skills, and interest: 3%
Common themes across companies

- Lack of qualified candidates for open positions
- Significant skills gaps between what businesses are looking for and what workers have been traditionally trained to do
- Training equipment is not being updated and limited opportunities for hands-on training
- Large number of skilled workers expected to retire, creating shortage of workers with the relevant skills and experience
- Startups have limited resources and face difficulty hiring new workers
Benefit From Workforce Development

- **Increase profitability** through improved productivity and reduced downtime
- **Reduce soft costs**, leading to lower costs for clean energy consumers
- **Drive workforce retention** by investing in employee development
- **Extend life span of equipment** by training employees on efficient operations
- **Reduce time** needed to hire and train new workers
- **Contribute to a cleaner environment** by reducing your carbon footprint
When to Consider Workforce Development and Training

Making this investment may be good for your business if you are:

- Looking to advance the skills of your employees
- Expanding your business’ clean energy services
- Identifying ways to increase profitability and lower costs
- Trying to make your building more efficient, safer, and comfortable
- Investing in new equipment, systems, and technologies
- Interested in reducing your carbon footprint and building sustainable business practices
- Trying to obtain or improve a green building certification
Workforce Funding and Impacts

**Nearly $70 million investment (2017-2025)**

**Training Goals:**

> 18,800 trained

> 2,000 new hires through on-the-job training incentives

> 3,200 student internships, work co-ops, etc.

> 200 trainers trained

> Private investment of $66 million
Workforce Funding Opportunities

**Energy Efficiency & Clean Technology Training** - *(PON 3981; $7 million)*
Supports organizations providing training and experience to workers in clean energy businesses

**Energy Efficiency & Clean Technology On-the-Job Training** - *(PON 3982; $10 million)*
Provides incentives to eligible energy efficiency and clean technology businesses throughout the supply chain to hire and provider on-the-job training

**Clean Energy Internship Program** - *(PON 4000; $10.5 million)*
Helps prepare the next generation of clean energy workers through internships – open to both prospective interns and the businesses that will employ them
Workforce Funding Opportunities

**Coming soon:**

**Building Operations and Maintenance** - *(PON 3715; $10.0 million)*

Supports curriculum development, career path training, apprenticeships, internships, training trainers, and coaching/mentorships to ultimately help reduce energy costs and carbon emissions.
Energy Efficiency & Clean Technology Training

*(PON 3981)*

$7 million available

**Projects funded** intended to develop and deliver training, provide hands-on experience and job placement assistance to ensure new and existing clean energy workers have skills businesses need.

**Training activities eligible** for funding include:
- developing, modifying, or implementing curriculum
- delivering training (on-line, classroom, on-site, etc.)
- equipment purchase for hands-on training
- hiring and training trainers
- marketing
- internships
- job placement services
- pre-apprenticeships and apprenticeships

**Proposers can include** unions, colleges and universities, manufacturers, distributors, trade associations, community-based organizations, technical high schools, training and job placement intermediaries, etc.

**Maximum proposal** $250,000, 30% cost share required

**Proposals Due**:
- May 23, 2019
- August 6, 2019
- October 22, 2019
- January 23, 2020

*Due dates after May 2019 are dependent upon funding availability as determined by demand.*
Energy Efficiency & Clean Technology On-the-Job Training

(PON 3982)

$10 million available

Funding to hire and provide on-the-job training (OJT) for workers for energy efficiency and clean technology jobs in these areas:
> high efficiency heating, ventilation, and air conditioning (HVAC)
> renewable heating and cooling
> high efficiency water heating
> insulation and air sealing
> high efficiency lighting and controls
> building automation and controls
> smart grid
> energy storage; and related areas

Businesses with 100 employees or less, NYSERDA will pay 50% of new employee’s hourly wage for 16 weeks. And 50% of the wage for 24 weeks if the worker is from a priority* population

Businesses with over 100 employees, NYSERDA will only pay incentives for new employees from priority populations – 50% for of hourly wage for 24 weeks

The maximum OJT award amount for a business is $100,000

* Priority Populations include veterans, disabled workers, low-income individuals, formerly incarcerated, Native Americans, dislocated power plant workers, and 18-24 year-old trainees in energy related job preparation programs.
Clean Energy Internship Program  
(PON 4000)

$10.5 million available over next six years approximately  
$1.75 million reserved annually through 2024

Enhances talent pipeline for energy efficiency and clean technology businesses by reimbursing employers who offer paid internship opportunities to college students or 18- to 24-year-olds that have completed or are enrolled in technical high schools, energy training, or certificate programs.

NYSERDA will reimburse interns’ salaries based on business size:  
> 20 or fewer employees, reimbursement of 90% of intern wages  
> 21 to 100 employees, reimbursement of 75% of intern wages  
> 100 or more employees, reimbursement of 50% of intern wages

Maximum of 12 weeks: fall or spring - maximum 18 hours per week; summer - maximum 40 hours per week

Maximum of five interns per session

Maximum of 12 interns over the course of the program

Reimbursed intern wages can range from minimum wage, up to $2 above minimum wage
Building Operations and Maintenance

(**PON 3715**) $10.5 million available

**Opening Again Soon**

Improving the skills of employees can significantly improve building efficiency and reduce operating costs.

Proposals must be for buildings or groups of buildings, including partnerships between businesses with common training needs – with annual expenditures of $1 million or more.

**NYSERDA will share up to 50% of the cost** of eligible projects, with a cap of $400,000 per application.

**Funding is available** to help employers and building owners develop training projects that create the educational strategy, on-site training framework, and tools needed to advance the skills of building O&M workers and prepare new workers beyond conventional classroom training.
Building O&M Partners

Here are some examples of training providers, building owners and facility management companies developing and implementing building O&M staff training projects:

ES Energy, LLC
Memorial Sloan Kettering Cancer Center
Ridgewood Bushwick Senior Citizens Council
NYS School Facilities Association
Rensselaer Polytechnic Institute (RPI)
SUNY Brockport
Related Management
NYU Medical Center
Montefiore
The Cooper Union
Housing Works
Realty Operations Group
32BJ Training Fund
Urban Green Council
Weill Cornell Medical College
SUNY School of Environmental Science and Forestry (ESF)
Association of Energy Affordability (AEA)
Interstate Renewable Energy Council (IREC)
Steven Winters Associates, Inc.
Dunn Development Corporation
Douglas Elliman Property Management
New York University
Robert E. Hill, Inc
A&E Real Estate
The Feil Organization
Smith Engineering
Thank you

Adele Ferranti, NYSERDA
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Radiant Store

Specializes in renewable energy

- BPI Gold Star Contractor

- Provides businesses and homeowners with cost-efficient, carbon-neutral solutions for their energy needs.

- Participated in NYSERDA’s On-the-Job training (OJT) program
  > Hired seven people in two OJT programs over the past 5 years
  > New hires have been in the trades: plumbing, heating, solar energy
OJT - Benefits for Employers

- Subsidized wages
- Customized training for your specific business needs
- Used as a tool to attract new hire candidates
- The OJT process is easy
  > The Department of Labor facilitates the paperwork and usually comes to your place of business for signatures once the paperwork is completed
  > NYSERDA reimburses the employer very quickly
OJT - Benefits for Employees

- Customized to meet the needs of the organization and the employees
- Allows for input from the OJT candidate
  > A skills assessment takes place to identify areas that need attention from a training perspective. The skills assessment is an integral first step in the OJT process and facilitates good communication about the candidates’ current skill levels.
  > Feedback throughout the process to adjust and make course corrections through the Department of Labor survey process.
- Retention of OJT trained employees is high
Thank you

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Cooper Union
Facilities Training
and Curriculum
Development
Project Goals

- Reduce energy use and carbon emissions
- Reduce operating costs by building the O&M skills of facilities staff
- Provide faculty and students opportunities to gain industry-relevant expertise by working alongside building energy professionals
- Build culture of continuous improvement and building recommissioning helping Cooper achieve its 40 x 30 carbon intensity reduction goal
41 Cooper Square

- LEED-Platinum-certified academic building
- Central atrium with recirculation
- Radiant heating/cooling ceiling panels and floors
- Six AHUs, some dedicated 100% OA units, some with enthalpy-based economizers
- Laboratory VAV fume hoods and several zone damper actuator applications and sequences
- Occupancy and CO₂ sensors
- Two 500-ton water cooled chillers
- Water-side free cooling
- 250 kW cogeneration plant with absorption chiller
- Siemens Building Management System
# Mechanical Systems Overview

<table>
<thead>
<tr>
<th>Space Description</th>
<th>Overhead VAV supply</th>
<th>Radiant Ceiling Panels</th>
<th>Radiant Floor</th>
<th>Finned Tube Radiation</th>
<th>Fan Coil Units</th>
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<tr>
<td>Laboratories</td>
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<td>Classrooms/Offices</td>
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<td>Main Entrance Lobby</td>
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<td>Multi-purpose Seminar Room &amp; Gallery Space</td>
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<tr>
<td>Art rooms (all subcellar and 9th floor levels)</td>
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<tr>
<td>Auditorium</td>
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<tr>
<td>Retail, Data, Elev.</td>
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Training Scope of Work & Process

Develop Training and Curriculum – *Learn the building to find operational insights*

- Site specific equipment fundamentals, historical operation and data analysis
- Develop Preventive Maintenance (PM) schedules and onsite assistance

Perform Training – *Most of the energy opportunities are operations related*

- Classroom training (PowerPoint decks)
  - Chiller Plant Operation
  - Operator Airside Training
- PM training and field assistance
  - Damper Actuator Troubleshooting – Make repairs as we are learning building
  - BMS PPCL Training, Troubleshooting & Optimization – Deep dive into control system
  - Chief Engineer Training
Training Example:

Cogen Heat Recovery Opportunity

Current recovery ~53%
Improvement opportunity

> 75% recovery = $21k annually
> 100% recovery = $40k annually

Implemented more aggressive hot water supply resets to improve heat recovery

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<th>Pre</th>
<th>Current</th>
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<tbody>
<tr>
<td>OA Temp</td>
<td>HWS Temp</td>
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<tr>
<td>0</td>
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<td>20</td>
<td>190</td>
</tr>
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<td>80</td>
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Training Example:

Temperature Day/Night Setbacks

1. LAB DAY/NIGHT Scheduler with PPCL. Use PPCL to change!!!

Use Point Commander to change Temperature STPT.
Student Involvement

Co-teaching of new Energy Efficient Building Systems Course

Engage student interns and undergraduate and Master’s students on building projects

> Baseline building energy consumption and tracing energy use using Sankey diagram
> Create data historian, energy dashboards, and reporting tools

*A goal is that Cooper students enter the workforce with industry relevant knowledge and skills*
Outcomes:

Energy Master Plan Assistance

- Reduced unoccupied office and laboratory air change rates
- AHU discharge air temperature resets
- Static pressure resets
- More aggressive hot water supply resets to improve cogen heat recovery
- Optimized scheduling and day/night setbacks
- Condenser water supply temperature optimization
- Repair damper actuators
- Identified leaky reheats
Energy Savings and Training Results

$192,659 in energy savings
215 tons of CO2 reduction
10 facilities staff trained
25 students trained
5 Master’s thesis projects
2 Senior Capstone Design projects

Students involved have gone on to full time positions at HVAC and energy firms and to pursue related graduate research
Lessons Learned and Potential Replicability

- Facilities staff are more engaged when training is site specific
- Align training initiatives to current operational needs
- Building trust with facilities staff and finding time for training is key

Cooper Union project provides a model for how industry professionals, operations staff, and engineering faculty and students can partner to strengthen the building industry skillset and workforce pipeline
Thank you

Melody Baglione
Professor and Chair of Mechanical Engineering, Facilities Energy Efficiency Advisor, The Cooper Union for the Advancement of Science and Art
What’s Next

Advancing Innovative Energy Solutions
a series of topical energy webinars and resources for members of the Business Council of NYS

Make Energy Work for you with Strategic Energy Management

Create a Reliable Supply of Energy and Save Using Energy Storage

The Future of Transportation is Already Here

Building Operational Intelligence

Resources

Keep up-to-date on NYSERDA programs, offerings, and information

nyserda.ny.gov/subscribe

Find information on workforce development
nyserda.ny.gov/putenergytowork/wf

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