

ENERGY EFFICIENCY TRAINING PROGRAMS IN COMMUNITY COLLEGES

The network of community colleges that provide training leading to the knowledge and skills required for the energy efficiency, retrofit, and other green industries extends across the U.S. and is growing fast. State, technical and community colleges in 41 states offer building efficiency analyst and other professional training (Table 1). Fifty-nine colleges are BPI Affiliates or in the process of becoming an affiliate. More than 90 additional community colleges host programs that prepare individuals for home performance industry jobs (Table 2).

The American Association of Community Colleges (AACC) is finalizing a project to create a central web site that will link over 1,000 community colleges across the U.S. with a collection of resources that community colleges can use to create curricula on building efficiency and other sustainable resources topics. The AACC project will link colleges to up-to-date material and promising practices in building efficiency and other sustainability and green workforce education topics. The Online Resource Center, scheduled for release October 10, has been named SEED (Sustainability Education and Economic Development.) The site will be organized as a matrix:

Topics or Sectors:

- A. Solar
- B. Wind
- C. Building efficiency (includes auditing and weatherization)
- D. Green building
- E. Other (name the topic, such as sustainability or biomass or organic agriculture)

Categories:

- 1. College-based examples of curricula and programs
- 2. Skills sets, competencies, and career pathways
- 3. Certifications and industry credentials
- 4. Partnership models
- 5. Professional development resources for faculty and staff
- 6. Workforce employment projections
- 7. Select funding opportunities
- 8. Industry Trends

BPI has provided SEED an extensive break-down of BPI resources to match the SEED categories in the Building Efficiency topic. When the site is launched, a report will be sent to community college presidents.

Table 1 State Coverage of Community Colleges with Energy Efficiency Training Programs.

Alaska	Kansas	Nebraska	South Carolina
Alabama	Kentucky	Nevada	Tennessee
Arizona	Louisiana	New Hampshire	Texas
Arkansas	Maine	New Jersey	Vermont
California	Maryland	New Mexico	Virginia
Colorado	Massachusetts	New York	Washington
Delaware	Michigan	North Carolina	West Virginia
Florida	Minnesota	Ohio	Wisconsin
Georgia	Missouri	Oregon	Wyoming
Illinois	Montana	Pennsylvania	
Iowa		Rhode Island	

Table 2 Energy Efficiency Training Programs, By State (List may not be fully comprehensive).

College	State	BPI Training Affiliate	BPI Training Affiliate Applicant	EE Program - BPI Aligned	EE Program (not community college)
University of Alaska Southeast	AK	x			
Chatthoochee Community College	AL			x	
NW Arkansas Community College	AR		x		
Pulaski Technical College	AR		x		
Central Arizona Association of Governments WORKING WITH AZ COLLEGE SYSTEM	AZ	x			
Central AZ College System	AZ		x		
Maricopa County Community College District (Estrella Mountain, Chandler-Gilbert and Phoenix Community Colleges)	AZ			x	
Century Center for Economic Opportunity	CA			x	
North Orange Community College District	CA			x	
Ventura Community College District	CA			x	
Solano Community College	CA			x	
Aims Community College	CO			x	
Arapahoe Community College	CO			x	
Colorado Mountain College	CO	x			
Community College of Aurora	CO			x	
Community College of Denver	CO			x	
Emily Griffith Opportunity School	CO			x	
Northeastern Junior College	CO			x	
Pueblo Community College	CO			x	
Red Rocks Community College	CO	x			
Delaware Technical & Community College	DE	x			

College	State	BPI Training Affiliate	BPI Training Affiliate Applicant	EE Program - BPI Aligned	EE Program (not community college)
Miami Dade Community College	FL			x	
Polk State College	FL		x		
WorkNEt Pinellas	FL			x	
Atlanta Technical Institute	GA			x	
Atlanta Technical Network	GA			x	
Iowa Lakes Community College	IA			x	
City Colleges of Chicago	IL			x	
Illinois Central College - Professional Development Institute	IL	x			
Parkland College	IL			x	
Rock Valley Community College	IL			x	
Wright College	IL			x	
Neosho County Community College	KS	x			
Kentucky Community & Technical College System	KY	x			
Delgado Community College	LA			x	
Bristol Community College (MassGREEN)	MA			x	
Cape Cod Community College	MA			x	
Greenfield Community College	MA			x	
Mass Green Initiative – 15 community colleges	MA			x	
Northern Essex Community College	MA				
North Shore Community College	MA	x			
Springfield Technical Community College	MA			x	
Allegheny College of Maryland	MD			x	
Anne Arundel Community College	MD			x	
Baltimore City Community College	MD		x	x	
Baltimore County Community College	MD		x		
Carroll County Community College	MD			x	
Cecil Community College (Harford County)	MD			x	
Chesapeake College and Prince George's Community College	MD			x	
Community College of Baltimore County	MD			x	
Frederick Community College	MD			x	
Harford Community College	MD			x	
Howard Community College	MD			x	
Montgomery College	MD			x	
Prince George's Community College	MD			x	
Wor-Wic Community College	MD			x	

College	State	BPI Training Affiliate	BPI Training Affiliate Applicant	EE Program - BPI Aligned	EE Program (not community college)
Eastern Maine Community College	ME	x			
Maine Community College System	ME	x			
Northeast Technical Institute	ME	x			
Northern Maine Community College	ME			x	
Southern Maine Community College – Efficiency Maine	ME			x	
Lansing Community College	MI			x	
Northwestern Michigan College	MI	x			
Fond du Lac Tribal & Community College	MN	x			
Jefferson Community College	MO				
Saint Louis Community College	MO	x			
Southeast Community College	NB			x	
Blue Ridge Community College	NC			x	
Caldwell Community College	NC		x		
Central Carolina Community College	NC	x		x	
Craven Community College	NC			x	
College of the Albemarle	NC			x	
Elizabeth City State University	NC			x	
Fayetteville Technical Community College	NC			x	
Isothermal Community College	NC			x	
North Carolina Community College System	NC			x	
Robeson Community College	NC				
Stanly Community College	NC	x			
Wake Technical Community College	NC	x			
Keene State College	NH	x			
Lakes Region Community College	NH	x			
Manchester Community College	NH	x			
County College of Morris	NJ			x	
Salem Community College	NJ	x	x		
Central NM Community College	NM		x		
Santa Fe Community College	NM	x			
Southern Nevada Community College	NV			x	
Truckee Meadows Community College	NV	x			
Association for Energy Affordability	NY				x
Bronx Community College	NY			x	
Bronx Community College - Center for Sustainable Energy	NY	x			
Broome Community College	NY			x	

College	State	BPI Training Affiliate	BPI Training Affiliate Applicant	EE Program - BPI Aligned	EE Program (not community college)
Broome County Community College	NY	x			
CUNY	NY		x		
Dutchess County BOCES - Adult Education	NY	x			
Erie Community College	NY	x			
Fulton-Montgomery Community College	NY			x	
Hudson Valley Community College	NY			x	
Monroe Community College	NY	x			
Onondaga Community College	NY			x	
Onondaga-Cortland-Madison BOCES	NY			x	
Stonybrook University	NY			x	
Suffolk County Community College	NY			x	
SUNY Canton	NY	x			
SUNY Ulster/Ulster County Community College	NY	x			
Westchester Community College	NY	x			
Cincinnati State Technical & Community College	OH	x			
Cleveland State Community College	OH			x	
Cuyahoga Community College, Workforce Solutions	OH	x			
Sinclair Community College	OH			x	
Stark State College of Technology	OH				
Zane State	OH				
Lane Community College – NW Energy Institute	OR			x	
Portland Community College	OR			x	
Lehigh Carbon Community College	PA			x	
Weatherization Training Center at Pennsylvania College of Technology	PA	x			
Community College of Rhode Island	RI	x			
Midland Technical College	SC		x		
South Carolina Technical College System	SC	x			
Jackson State Community College	TN			x	
Pellissippi State Technical Community College	TN	x			
Austin Community College	TX	x			
Building Performance & Comfort, Inc. TRAINING FOR AUSTIN CC AND WAP TEXAS	TX	x			
Building Performance Center WORKS	TX	x			

College	State	BPI Training Affiliate	BPI Training Affiliate Applicant	EE Program - BPI Aligned	EE Program (not community college)
WITH CC					
YOUTHBUILD	USA		x		
Lord Fairfax Community College	VA			x	
Virginia Community College System	VA			x	
Virginia Highlands	VA			x	
Virginia Western Community College	VA			x	
VT Technical College	VT		x		
Bellingham Technical College	WA			x	
Cascadia College	WA			x	
Cascadia Community College	WA	x			
Edmonds Community College	WA			x	
Everett Community College	WA			x	
Grays Harbor Community College	WA			x	
Green River Community College	WA			x	
Olympic Community College	WA			x	
Seattle Central Community College	WA			x	
Shoreline College	WA			x	
South Seattle Community College	WA	x			
South Sound Community College	WA			x	
Spokane Community College	WA	x			
Tacoma Community College	WA			x	
Washington State University Energy Program	WA	x			
Lakeshore Community College	WI			x	
Kanawaha Valley Community College	WV			x	
Pierpont Community & Technical College	WV			x	
New River Community College	WV			x	
Casper College	WY			x	
Laramie County Community College	WY	x			
Total	150	46	13	90	1

The states are supportive of energy efficiency training. For example, The California Energy Commission, State Energy Office and the Employment Training Panel have provided extensive funds for clean energy workforce training in California, which is being deployed in partner programs between workforce investment boards and community colleges to provide BPI training throughout California. BPI works with state and coalition education systems nationwide to encourage curriculum licensing and to increase home performance training opportunities.

Training typically covers the fundamentals of energy efficient retrofit and many community colleges offer advanced training. Programs may include courses on weatherization training, air leakage control and insulation installer, energy auditor training. Some example programs are described below.

Springfield Technical Community College, Springfield MA

Weatherization Installer training Program:

After completing this course, students will be qualified to work as professional air sealing technicians and insulation installers. Successful graduates of the course will be prepared to take the BPI Installer exams for Air Sealing and Densepacking, assuming that the final certification materials from BPI are similar to the drafts currently available.

Participants who successfully complete this program will be able to:

- Determine where the thermal boundary should be in any typical single family residence and identify potential air leakage points in that barrier
- Determine the best materials and methods for sealing all of the typical leakage points found in a single family residence
- Seal all typical leakage points with the most efficient and effective use of time and materials and test their seals for air-tightness
- Apply air-sealing techniques in compliance with all relevant building and fire code requirements
- Identify appropriate insulation materials for any given application in a single family residence
- Install all standard insulation materials in a manner that assures maximum practical insulating value, minimal damage to the property, occupant health and safety, and compliance with all relevant building and fire codes
- Install house ventilation components as directed
- Work in a manner that ensures their own safety and the safety of job-site residents and property

Greenfield Community College, Turner Falls, MA

Weatherization Installer Course:

After completing this course, students will be qualified to work as professional air sealing technicians and insulation installers by learning to:

- Determine where the thermal boundary should be in any typical single family residence and identify potential air leakage points in that barrier
- Identify appropriate insulation materials for any given application in a single family residence, seal and test their seals for air-tightness
- Install all standard insulation materials in a manner that assures maximum insulating value, minimal damage to the property, occupant health and safety, and compliance with all relevant building and fire codes
- Install house ventilation components as directed
- Work in a manner that ensures their own safety and the safety of job-site residents and property

Bristol Community College, Bristol, MA

MassGREEN:

This 78 hour training prepares students to work as professional air sealing technicians and insulation installers. Successful graduates of the course will be prepared to take the BPI Installer exams for Air Sealing and Densepacking. The majority of this program will consist of hands on training experience.

After completing this course, students will be able to:

- Determine where the thermal boundary should be in any typical single family residence and identify potential air leakage points in that barrier
- Determine the best materials and methods for sealing all of the typical leakage points found in a single family residence
- Seal all typical leakage points with the most efficient and effective use of time and materials and test their seals for air-tightness
- Apply air-sealing techniques in compliance with all relevant building and fire code requirements
- Identify appropriate insulation materials for any given application in a single family residence
- Install all standard insulation materials in a manner that assures maximum practical insulating value, minimal damage to the property, occupant health and safety, and compliance with all relevant building and fire codes
- Install house ventilation components as directed
- Work in a manner that ensures their own safety and the safety of job-site residents and property

Delgado Community College, New Orleans, LA

Energy Efficiency Specialist Training Program:

Delgado Community College has formed a partnership with the Louisiana Department of Natural Resources, Home Builders Association of Greater New Orleans, and Entergy New Orleans Inc. to offer an Energy Efficiency Specialist Training Program. The goal of this training program is to create a workforce of Energy Efficiency Specialists that can perform the following duties:

- Analyze Energy Efficient (EE) Recommendations
- Contractor Coordinator (Outside are of expertise)
- Home and Small Business Energy Assessments
- Install Economic EE Recommendations

Lane Community College– Northwest Energy Education Institute Eugene, Oregon 2-Year Degrees

Energy Management:

- Evaluate the energy use patterns for residential and commercial buildings and recommend energy efficiency and alternative energy solutions for high-energy consuming buildings.
- Understand the interaction between energy consuming building systems and make recommendations based on that understanding.
- Construct energy evaluation technical reports and make presentations for potential project implementation.
- Use appropriate library and information resources to research professional issues and support lifelong learning.

- Access library, computing and communications services, and obtain information and data from regional, national and international networks.
- Collect and display data as lists, tables and plots using appropriate technology (e.g., graphing calculators, computer software).
- Develop and evaluate inferences and predictions that are based on data.
- Determine an appropriate scale for representing an object in a scale drawing.
- Interpret the concepts of a problem-solving task, and translate them into mathematics.

Renewable Energy Technician:

This professional technical program is offered as a second year option within the Energy Management Program. The coursework prepares students for employment designing and installing solar electric and domestic hot water systems. An advisory committee made up of renewable energy practitioners guides program development.

Water Conservation Technician:

- Design, implement, evaluate and market water conservation programs. Perform public outreach to a broad audience.
- Evaluate usage patterns for rural, urban, residential and commercial sites; recommend water efficiency measures as well as alternate water sources, as appropriate.
- Understand water distribution, flow and elimination systems; basic hydraulics; quality issues; mass balance and time of use. Understand the multiple stressors to water supply and how they interact to affect supply, demand and other issues.
- Monitor, collect, interpret and analyze data to evaluate effectiveness of programs and adjust program over time. Calculate water and cost savings from programs at multiple scales (including cost/benefit analysis).

Resource Conservation manager (RCM)

The RCM sector is currently showing exponential growth. Regional utilities are developing significant programs that will require qualified graduates to be employed by school districts, higher education, and city and state agencies to help control their waste throughput. The US military has increased posted positions for Resource Efficiency Managers and [Better Bricks](#), the education department of the Northwest Energy Efficiency Alliance has asked to join forces with the Energy Program to develop RCM coursework.

Certification Courses:

- Sustainable Building Advisor Certificate Program: The Sustainable Building Advisor (SBA) Certificate Program is a nine-month, specialized training program, designed to enable graduates to advise employers or clients on strategies and tools for implementing sustainable building. Benefits from participating in the SBA program often include saving long term building operating costs, improving the environmental, social and economic viability of the region, reducing environmental impacts and owner liability plus a chance to improve your skills in a rapidly growing field.
- Residential energy Auditor / Inspector Training Program: A five-day course that includes training in the principles of energy auditing and weatherization inspection. This comprehensive program includes training in the principles of energy, energy and the building shell, energy auditing, air

leakage, insulation, windows and doors, heating and cooling systems, indoor air quality, lighting and appliances, and water heating. Attendees will be trained to conduct energy audits and work with utility customers in the field.

- **Buildings Operators Certification:** BOC is a professional development program created by The Northwest Energy Efficiency Council (NEEC), and delivered in Oregon by NEEI. It is designed for operations and maintenance staff working in public or private commercial buildings. It certifies individuals in energy and resource-efficient operation of building systems at two levels.
- **Energy Management Certification:** This program goes beyond the fundamentals and teaches a broad spectrum of energy management principles and techniques. Topics include building energy use, glazing, insulation, building envelope, heating/cooling, secondary HVAC, controls, central plant equipment, energy auditing, operation and maintenance. Each topic is covered by a discipline expert.

Lansing Community College, Lansing, MI: Lansing was one of the first colleges in the nation to incorporate alternative energy into its curricula and sustainability practices on campus. With help from \$1 million grant from the U.S. Department of Energy, college instructors help other colleges and universities across the country create their own alternative energy curricula. LCC's automotive technology students work on hybrid vehicles and are building an internal combustion engine powered by a fuel cell. The college's HVAC and building construction students learn energy management and alternative methods for heating and cooling buildings and residences. Students learn all of this first-hand at LCC's West Campus, heated and cooled by a geothermal system. LCC-educated alternative energy technologists are finding employment with public utilities, alternative energy systems manufacturers, architectural and engineering consulting firms, energy management companies, heating and cooling contractors, and specialty independent energy systems retailers.

Lakeshore Community College, Cleveland, WI: Lakeshore taps into the windy shoreline of Lake Michigan with a turbine that yields 50,000 kilowatt hours of energy a year and supplies about 2 percent of the campus' electrical energy. The turbine, constructed in 2004, is used for technical training, workshops, seminars and courses on renewable energy systems.

Red Rocks Community College, Lakewood, CO: Red Rocks Community College's new associate degree program in renewable energy technology combines elements of existing HVAC, carpentry, and construction technology programs with courses in energy system design, energy audit techniques, and solar panel installation.

Santé Fe Community College, Santa Fe, NM: Santa Fe Community College's Sustainable Technology Center offers non-credit courses and green job training programs. Credit programs include an associate degree in environmental technologies with concentrations in water conservation or solar energy, and certificates in environmental technologies, green building systems and solar energy.

Hudson Valley Community College, Troy, NY: Hudson Valley Community College's Workforce Development Institute (WDI) includes the Center for Energy Efficiency & Building Science, which provides training on the incorporation of energy efficiency methods into building trades. The college has established eight additional training sites for this program and several more sites are planned. In addition, the WDI offers a 40-hour photovoltaic electric systems introductory credit-free course designed for people interested in learning the fundamentals of photovoltaic system design and installation.

Cape Cod Community College, West Barnstable, MA: Hudson Valley Community College's Workforce Development Institute (WDI) includes the Center for Energy Efficiency & Building Science,

which provides training on the incorporation of energy efficiency methods into building trades. The college has established eight additional training sites for this program and several more sites are planned. In addition, the WDI offers a 40-hour photovoltaic electric systems introductory credit-free course designed for people interested in learning the fundamentals of photovoltaic system design and installation.

Iowa lakes Community College, Northeastern IA: Iowa Lakes Community College offers an associate degree program that focuses on the operation and maintenance of wind turbines and includes a summer internship between the first and second year of training, as well as a one-year diploma program option. The college currently owns and operates a V-82 turbine and has a V-90 prototype nacelle that students use as an educational laboratory. The Wind Energy and Turbine Technology Program's curriculum is industry-driven, with a program advisory committee as an integral part of the education. Representatives from business serve as guest speakers, provide industry input on curriculum and faculty development, and sponsor field trips to manufacturing and service facilities in the area.

North Carolina Community College System

- Central Carolina Community College, Weatherization Faculty Training Program
- **Lehigh Carbon Community College, Green Energy Training Center:**
 - BPI Building Analyst / Energy Auditor Training & Certification: Building Performance Institute (BPI) Certification is the recognized national standard for contractors engaged in the growing fields of energy related improvements and energy auditing such as HVAC, weatherization and renewable energy. BPI certification will be required for participation by contractors in most upcoming utility and federal and state incentive programs.

DOE awarded \$29 million in ARRA funds for 34 weatherization training center projects in 27 states, including:

- Pulaski Technical College, North Little Rock, Ark
- Century Center for economic Opportunity, Garden, CA
- WorkNEt Pinellas, St. Petersburg, FL
- Baltimore City Community College, Baltimore, MD

Solano Community College, Green Building and Clean energy Pre-Apprenticeship: Training activities will contain: classroom and hands-on skill training in environmental literacy, soft skill development, and Green Building (LEED certified). Specified training will consist of energy fundamentals; retrofits & energy efficiency; water efficient buildings and retrofits; solar hot water and space heating; Solar – Photovoltaic (PV). Supportive classes addressing the basic skills of Math, Reading, and Writing will be available to those students requiring such training.

Efficiency Maine

- Building Operator Certification Level 1: Building Operator Certification is a nationally recognized training program designed to educate facilities personnel in the energy and resource efficient operation and maintenance of building systems.
- Energy Auditor & BPI Building Analyst 1: This course will prepare students to pass the Building Performance Institute (BPI) Building Analyst I Written and Field Exams. Students will learn to conduct accurate building analysis, provide information, reports and documentation of findings, make appropriate recommendations for weatherization and energy improvements, including financial benefits and payback on energy investments. Students will be knowledgeable with respect to space and water heating systems and combustion appliance zones. Upon receipt of BPI

certification, candidates will be authorized to conduct CAZ tests, flue gas analysis, carbon monoxide tests, spillage tests and gas leak tests.

- Weatherization for the Homeowner – Level 1: This course will help the homeowner to understand the house as a system, and basic energy concepts. Students will learn about energy movement in the home, how heat is lost, and how weatherizing the home will improve indoor air quality, occupant safety and the longevity of the building. This class will explore some of the common myths of weatherization, and very costly mistakes most people make when attempting to weatherize a home. Whether you are planning to “do it yourself”, or want to better understand about work that you are hiring out, this course is for you!
- Weatherization for the Homeowner – Level 2: This course will expand on the “House as a System” concept, and teach advanced energy sciences. Students will learn how to properly weatherize the house to minimize heat losses. We will practice some of the techniques used by professionals, address some of the challenges, learn to select appropriate materials for the task at hand, and how to avoid mistakes that could create safety hazards in your home. This course will prepare the student to conduct a very effective weatherization project, and make the best use of their weatherization dollars.