



Building
Energy
Education

fundamentals

Partnered with Illinois EPA Office of Energy
Sponsored by DOE

April 22, 2022



SEDAC

SMART ENERGY DESIGN ASSISTANCE CENTER

Providing effective energy strategies for buildings and communities

Who We Are

The Smart Energy Design Assistance Center (SEDAC) is an applied research program at University of Illinois.

Our mission: Reduce the energy footprint of Illinois and beyond.



BEE Fundamentals Partners & Participants



Illinois Environmental
Protection Agency

Lewis & Clark Community College
McHenry County College
Moraine Valley Community College
Southwestern Illinois College
Triton College
Illinois Central College
Kishwaukee College
Olive-Harvey College
Oakton Community College
Illinois Eastern Community College
John A Logan College
Hartland Community College
Rend Lake College
Harper College

University of Illinois
University of Chicago
Northern Illinois University
Chicago Public Schools

Ameren Illinois / Leidos
Illinois Green Alliance (IGA)
Illinois Green Economy Network (IGEN)

Village of Matteson
City of Rock Island
City of Naperville
City of Ottawa
Village of Midlothian
City of Peoria **and many more**



HAWAII STATE
Energy Office

Kauai Community College
Honolulu Community College
UH Maui College
Brigham Young University-Hawaii

Leidos – Hawaii Energy
Hawaiian Electric

Island Green Architecture
Bowers + Kubota Consulting
STUDIO OXEYE
D.R. Horton
Saito Design Associates
Plumbing & Mechanical Contractors Association of Hawaii
(PAMCA HI)
Islandwide mechanical service
Oahu Air Conditioning Service, Inc.
TMA Architects
Economy Plumbing & AC
Bowers and Kubota Consulting
Mason Architects
S. Biniaris Architect
Colliers

Kauai County
Maui County Office of Economic Development
City & County of Honolulu
County of Hawaii
Hawaii Community Development Authority
Hawaii Department of Education **and many more**



Nevada Governor's
Office of Energy

Western Nevada College
College of Southern Nevada
Truckee Meadows Community College

Clark County School District

Nevada Builders Alliance
Home Energy Connection
GRN Vision

Desert Research Institute
International Code Council (ICC)
Envirolution
Plumbing, Heating, Colling Contractors of Nevada
(PHCC NV)
Home Energy Connection

Clark County
City of Las Vegas
City of North Las Vegas
City of Henderson
City of Mesquite
City of Elko
City of Sparks
City of Reno **and many more**



What is BEE Fundamentals?

This program introduces community college students and young professionals to **energy efficiency and energy code topics** to prepare **the next generation of professionals** to integrate energy efficiency into their work.



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Program Q & A

Who is the **target audience**?

- Community college instructors & students, entry level building professionals

Does the program prepare students for a **specific job or certification exam**?

- No. Provides fundamental knowledge relevant for many jobs and exams.

Program Q & A

How **long** is the training program?

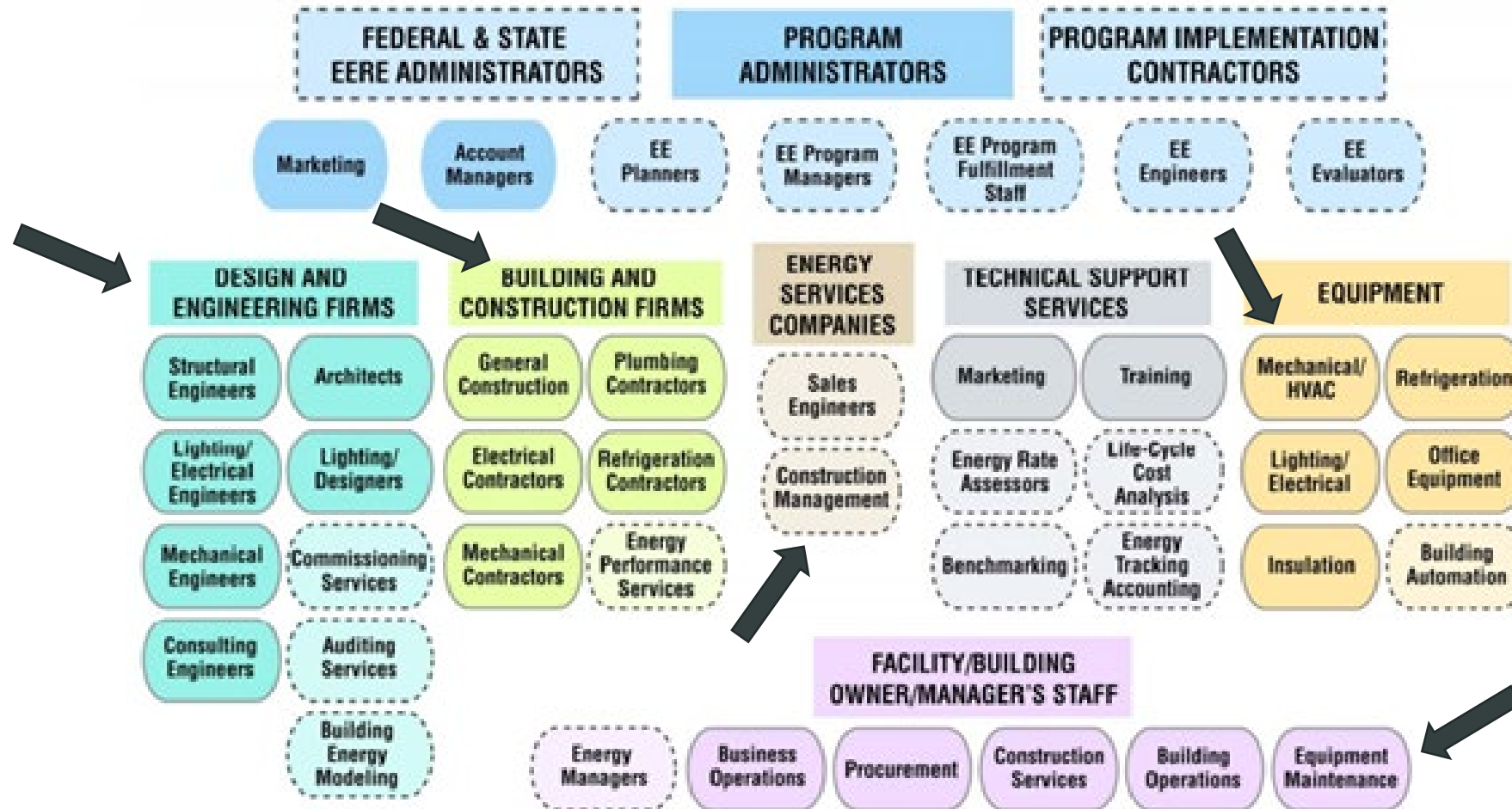
- 15 modules (~60 minutes of content), broken up into smaller chunks

What **background knowledge** is required to teach the modules?

- Appropriate for those who teach courses in building design and construction, HVAC, architecture, mechanical engineering, energy management, and sustainability

Careers in Energy Efficiency

There are many different energy efficiency jobs.



<https://emp.lbl.gov/publications/energy-efficiency-services-sector>

Careers in Energy Efficiency

Energy efficiency jobs span a range of skills.



Building Related Jobs:

- ✓ Design
- ✓ Construction
- ✓ Operation



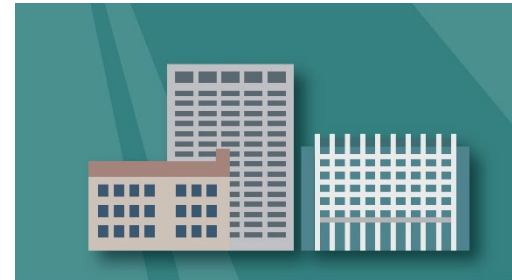
Policy & Planning

- ✓ Marketing
- ✓ Proposal Writing
- ✓ Research



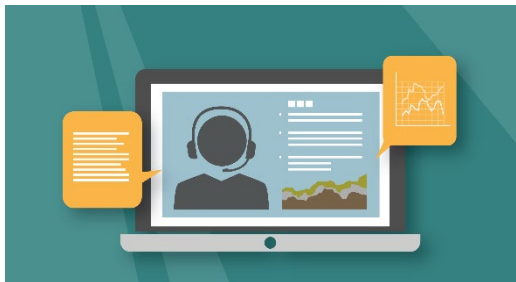
Analysis & Computation:

- ✓ Calculate Savings
- ✓ Manage Data
- ✓ Generate Reports



Financial:

- ✓ Sales & Cashflow Analysis
- ✓ Project Financing
- ✓ Project Management



Customer Service & Training

- ✓ Sell Products and Services
- ✓ Quality Control
- ✓ Teach Students

Careers in Energy Efficiency

Building related jobs address energy efficiency.



Architects & Engineers

- ✓ design for efficiency
- ✓ ensure code compliance and safety



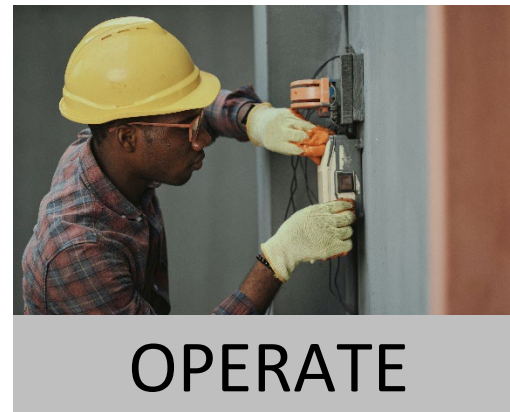
Contractors and Construction Managers

- ✓ build efficiently
- ✓ make buildings more efficient when they renovate



Installers & Technicians

- ✓ install efficient equipment
- ✓ make sure it is operating properly



Building Operators

- ✓ ensure that buildings run smoothly and efficiently
- ✓ maintain efficiency

Careers in Energy Efficiency

There are many non-construction, technical energy efficiency jobs, too.

Industrial: Factories and manufacturing have big energy efficiency opportunities



Program Implementation: Identify opportunities for clients to take advantage of utility energy efficiency programs



Product Development: Engineers and designers develop products to support energy efficiency in other sectors



Public Works: Reduce the energy use of vital public services such as water treatment and public transportation.



Careers in Energy Efficiency

There are many non-construction, technical energy efficiency jobs, too.

Sales and marketing:
Sell energy efficiency products and services



Program management:
Help manage utility energy efficiency programs



Accounting: Help finance and facilitate energy efficiency projects



Policy making: Help develop the policies that prioritize energy efficiency



Educating: Educate people about the benefits of energy efficiency



Code Professional Career

Figure 2: Plans to Leave the Building Regulatory Profession

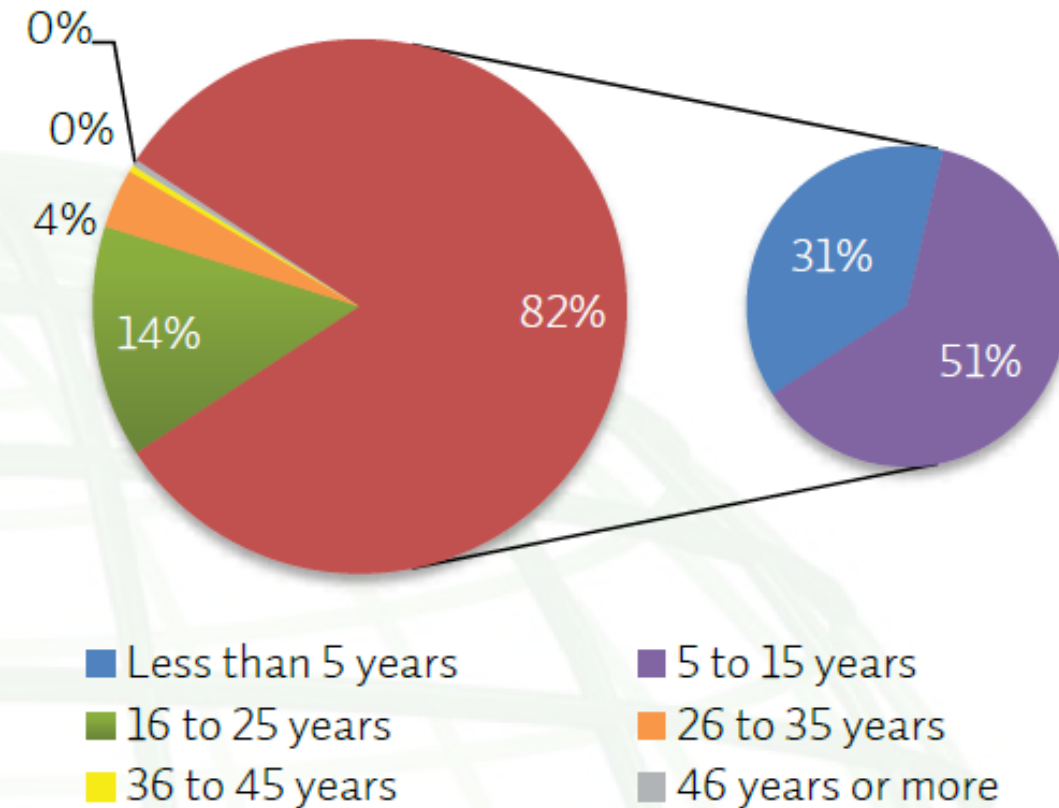
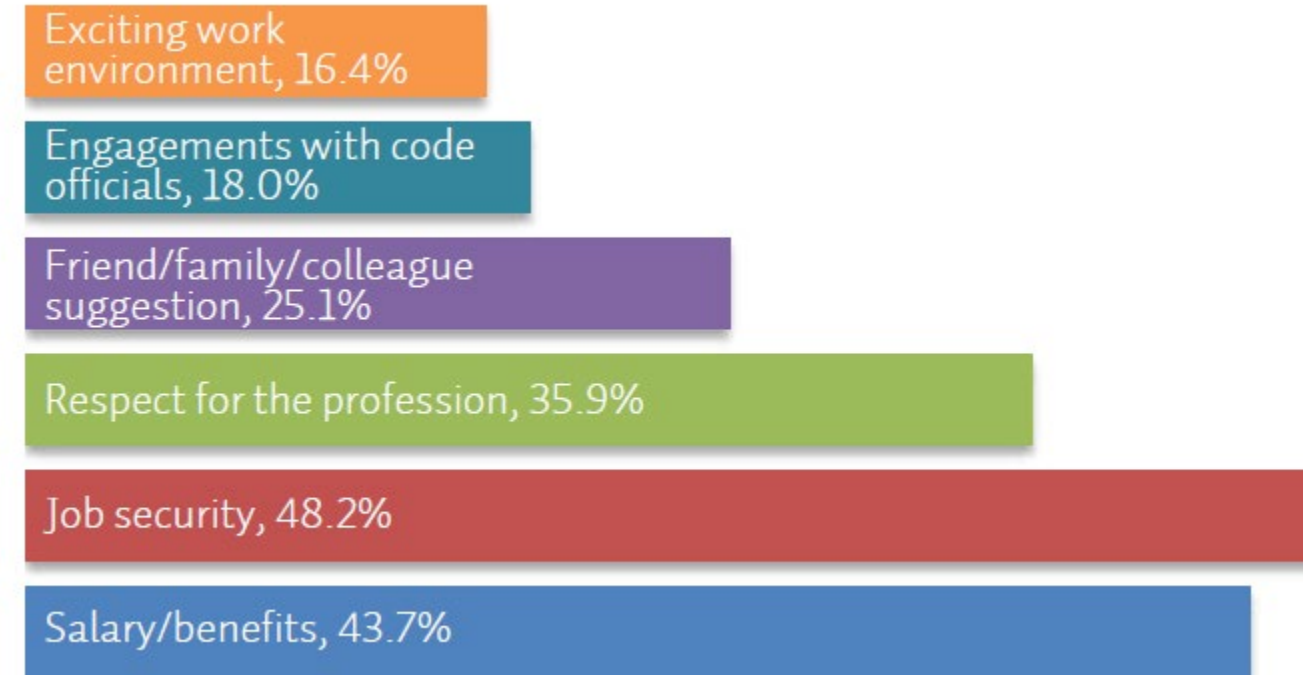


Figure 10: Reasons for Pursuing Career as Code Professional



Code Professional Career

“... far more rewarding, as you **maintain vigilance** over all structures built in your jurisdiction to ensure they meet the minimum standards of the laws and codes.”

“I believe that my 25 years in the field of commercial construction as an **apprentice, journeyman, foreman and supervisor** served me well when I made the decision to enter the inspection field.”

“**Extremely rewarding**, always helping people, always learning, never a dull moment, always in demand.”

“Get all of the vocational training you can, and work in the building trades field, so you have a **good understanding** of how a structure should go together. Work for a good, reputable contractor for at least two years and **train, train, train.**”

Why BEE Fundamentals?

“We’re going to keep struggling with code compliance **until energy code training permeates the building trades.**”

- IL Code Official

“We offer basic, introductory exploration of the topic...it would be great to **focus more on the IECC and how it relates**”

- IL Instructor

“I don’t just keep using the same book over and over...I like to keep [my students] apprised of **what’s going on in the world today**”

- NV Instructor

“Most people tend to learn better when they are able to have **hands-on experience or see live examples** instead of only reading about it.”

- HI Code Consultant

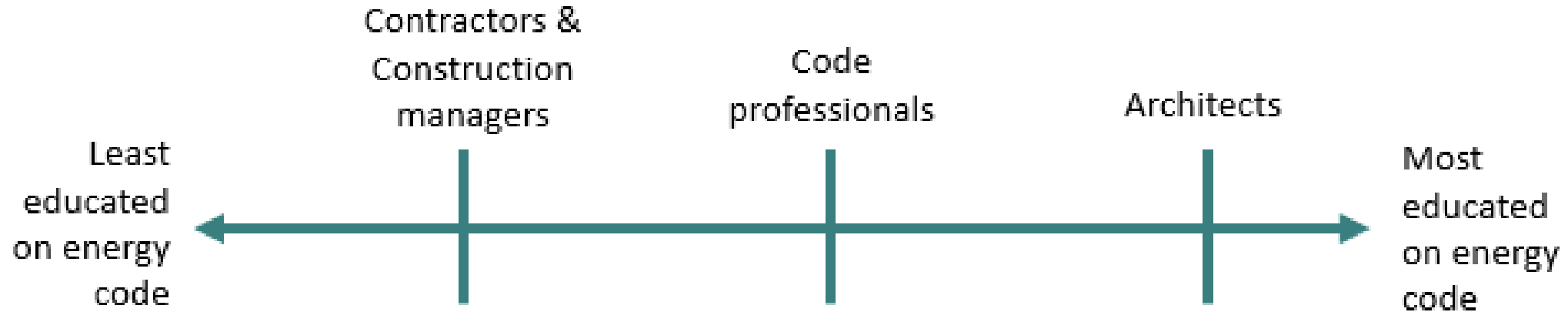
What We've Learned: Training Needs Assessment

Methods

- Literature review & feedback from code officials, instructors in IL, NV and HI.
- Surveyed about 60 community college programs & curricula
- Reviewed literature on barriers & best practices

Results

Interviewees agreed that there is a need for more energy code/energy efficiency training in the building trades



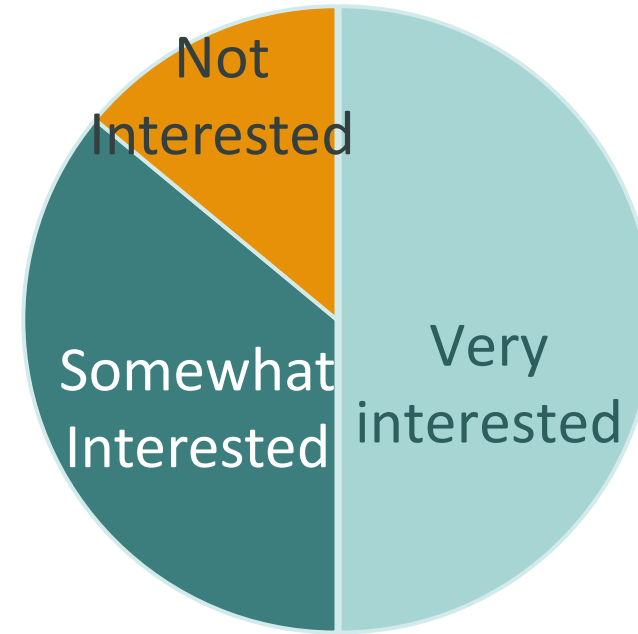
“We’re going to keep struggling with code compliance until energy code training permeates the building trades.”

- IL Code Official

Results

Strong Interest in additional training

86% of instructors are interested in enhancing energy and energy code education in their programs.



“We offer basic, introductory exploration of the topic...it would be great to focus more on the IECC and how it relates”

- IL Instructor

Results

What content should be taught?

- Energy code/energy efficiency **basics**
- **Whole-building** approach
- Information about **new practices, technologies**
- Information about **careers** in codes, energy efficiency

“I don’t just keep using the same book over and over...I like to keep [my students] apprised of what’s going on in the world today”

- NV Instructor

Results

How should the content be taught?

Engaging teaching methods

- Short videos
- Demonstrations
- Building science basics
- Self-directed learning activities
- Experiential learning

Not engaging teaching methods

- Lectures
- Rote memorization

“Most people tend to learn better when they are able to have hands-on experience or see live examples instead of only reading about it.”

- HI Code Consultant

Results

Is it feasible to integrate new content into existing curriculum?

Feasible

- Small, add-on elements
- Resources to reinforce existing content

Not feasible

- Major changes, additions
- Stand-alone courses

Barriers to making major changes:

- Class time
- Established learning objectives
- Administrative approval
- Advisory committee approval
- Transfer requirements

“For anything you add, something has to be removed.”

- IL Instructor

What We've Developed:

Building Energy Education (BEE)

Fundamentals

BEE Fundamentals Program Webpage

https://smartenergy.illinois.edu/bee_fundamentals/



About ▾

Programs ▾

Who We Serve ▾

Resources ▾

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Building Energy Education Fundamentals

Home > Energy Code Training > Building Energy Education Fundamentals



Building
Energy
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fundamentals

Teach energy efficiency through energy code basics

Hands-on Curriculum | Instructor Training | Resources

Instructor Toolkit:
How to Use our Curriculum



Access our Modules!
Login to our Moodle Site



Instructor Toolkit

Instructor Toolkit:
How to Use our Curriculum



ABOUT OUR PROGRAM

What is this training program about?



Why all the focus on energy codes?



Who should use this program?



Will this training prepare students for a job or certification exam?



Who created this training program?



How can I be involved and get updates?



<https://smartenergy.illinois.edu/instructor-toolkit>



USING OUR CURRICULUM

Are the modules free to use?



Do I need to use all of the modules?



How should I select which curriculum to use?



How do my students and I access the modules?



Can my students work through the material on their own?



How can I provide feedback?



INTRO MODULES



Community College Energy Code Training Program: ...



1. Energy Efficiency Careers & Pathways



3. Introduction to Energy Codes & Standards



4. Navigating Energy Codes & Standards



1. Accessing the Codes: Presentation
2. Looking up Requirements: Presentation
3. Energy Code Compliance Paths: Presentation
4. The Approval and Permit Process: Presentation
5. Combined presentation, in-class exercise, review worksheet, and Jeopardy activity

Moodle

<https://learn.smartenergy.illinois.edu/>



SEDAC eLearning

ⓘ Cookies must be enabled in your browser ⓘ

Is this your first time here?

For full access to this site, you first need to create an account.

Already have an account?

	username

☒ Remember username

Log in

[Forgotten your username or password?](#)

[Create new account](#)

1. Energy Efficiency Careers & Pathways

Home > Courses > Intro Modules > 1. Energy Efficiency Careers

Turn editing on

1. Energy Efficiency Careers & Pathways

Learn about careers that engage with energy efficiency and the energy code.



1.1 Careers in Energy Efficiency

Objective: Identify common energy efficiency careers and job titles, describe what people do in these careers, and what motivates them.

Topic's progress



1.3 Code Official Careers

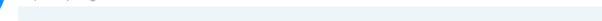
Objective: Identify building code official careers and describe pathways to these careers.

Topic's progress



Quiz & Survey

Topic's progress



1.2 Pathways to Energy Efficiency Careers

Objective: Describe potential career pathways to common energy efficiency jobs

Topic's progress



Activities

Want to teach all chapters in this module at once? Use our combined presentation. Assess learning on all chapters with this review activity and worksheet.

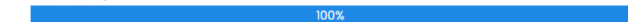
Topic's progress



Completion Certificate

Get your completion certificate for this module.

Topic's progress



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Moodle: How to Navigate



https://www.youtube.com/watch?v=SwMPYh26E0c&ab_channel=SEDACILLINOIS

BEE Fundamentals Webinars & Workshop

https://smartenergy.illinois.edu/bee_fundamentals/

PROGRAM LAUNCH

HAWAII LAUNCH WEBINARS

Part 1: April 7, 2022, 12:00-1:30 pm HST

[Register here](#)

Part 2: April 14, 2022, 12:00-1:30 pm HST

[Register here](#)

Part 3: April 21, 2022, 12:00-1:30 pm HST

[Register here](#)

Hawaii Launch Part 1 Agenda



Hawaii Launch Part 2 Agenda



Hawaii Launch Part 3 Agenda



NEVADA LAUNCH WEBINAR

April 20, 2022 from 10am-12pm PST

RSVP via email: info@energy.nv.gov

Nevada Launch Agenda



ILLINOIS LAUNCH WEBINAR

April 22, 2022 from 2-4pm CST

[Register here](#)

Illinois Launch Agenda



TRAIN-THE-TRAINER WORKSHOP

(for All States)

April 29, 2022

2:00-4:00 pm CST (12 – 2pm PST, 9 – 11am HST)

[Register here](#)

Train the Trainer Workshop Agenda





Questions?

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217-300-1820