Center For ENERGY Workforce Development

TOOLKIT

Getting Buy-in for the Energy Industry Fundamentals (EIF) Credential

February 2017

Toolkit At-a-Glance
Toolkit: Energy Industry Fundamentals Certificate

Toolkit Purpose	To enable member companies to gain understanding and recognition of Energy Industry Fundamentals Certificate as an industry recognized credential.
What are the benefits of the program to the member company?	- This training/credential helps make occupation-specific training more meaningful, and enables students to understand how one's company (once hired) and job fits into the big picture. - In many instances, utilities end up having to provide this training after employees are hired. - Applicants with this certificate have a much broader and deep understanding of the energy industry.
How can member companies obtain access to the curriculum?	- The curriculum is available on the CEWD Energy Industry Curriculum Center at: http://www.cewd.org/curriculum/
What is included in the Toolkit?	- Presentation on Energy Industry Fundamentals - Energy Industry Fundamentals Curriculum Blueprint - Overview of the Energy Industry Fundamentals Certificate - Credentialing Overview

Energy Industry Fundamentals Certificate Program

The course content focuses on understanding various types of energy and their conversion to useable energy such as electrical power. How generated electrical power is transmitted and distributed to the point of use.

01.0 Demonstrate knowledge of the basic and emerging principles and concepts that impact the energy industry-- the student will be able to:.

- 01.01 Explain the flow of energy from generation through distribution to the customer.
- 01.02 Discuss the history of the United States energy industry/infrastructure (refer to Energy Information Administration www.eia.doe.gov).
- 01.03 Identify the role and function of generation, transmission and distribution organizations.
- 01.04 Explains the role of regulatory bodies in the energy industry (Federal Energy Regulatory Commission www.ferc.gov ; Public Service Commission of the State of Florida www.psc.state.fl.us) (highlight "obligation to serve").
- 01.05 Discuss environmental laws and regulations that impact the energy industry (local, state, and federal) and explain importance of proper documentation to ensure compliance.
- 01.06 Explain the different structures of energy companies, including investor-owned utilities, municipalities (and associated utility practices such as water/wastewater), electric cooperatives, independent power producers and can explain the different lines of energy business, including electric and gas.
- 01.07 Describe the process of electric metering and billing for energy consumption.

02.0 Apply compliance with procedures necessary to ensure a safe and healthy work environment-- the student will be able to:

- 02.01 Review the role of the U.S. Department of Labor/ Occupational Safety and Health Administration in work place safety. (http://www.complianceregs.com/29cfr/1910/subR/1910-269.html)
- 02.02 Identify both potential hazards and accident scenarios in the work environment.
- 02.03 Follow established safety procedures (OSHA regulations and utility company procedures).
- 02.04 Evaluate changes in the environment with respect to their impact on safety of self and others.
- 02.05 Promote effective local, state, and national security operations for the protection of people, data, property and institutions.
- 02.06 Comply with energy industry safety procedures and proper ways to perform work.
- 02.07 Name potential threats created by deviation from safety procedures and improper use of tools and equipment.
- 02.08 Use safety equipment as specified by user manuals and safety training.

02.09 Use Personal Protective Equipment (PPE) including safety glasses, hearing protection, gloves, work boots, and hard hats.
02.10 Keep personal safety equipment in good working order.
02.11 Use tools and equipment in compliance with user manuals and training.
02.12 Call attention to potential and actual hazardous conditions as they arise.
02.13 Alert coworkers and supervisory personnel to hazardous conditions and deviations from safety procedures in a timely manner.
02.14 Maintain appropriate certification and is knowledgeable in first aid or first response procedures.
02.15 Demonstrate understanding and knowledge of lock/tag out practices in the work place.
02.16 Notify person in charge and/or coworkers of unsafe work conditions.
02.17 Stop the job if there are unsafe working conditions.

03.0 Understand electric power generation-- the student will be able to:

03.01 Explain the conventional electric power generation systems and process (coal, gas, hydroelectric, and nuclear).
03.02 Identify electric power generation equipment and systems.
03.03 Identify various conventional electric power generation fuel sources and the cost/ efficiency/environmental issues associated with each:
a. Explain how oil was created and list its advantages and disadvantages.
b. Explain how coal was created and what are its advantages and disadvantages.
c. Explain how natural gas was created and what are its advantages and disadvantages.
d. Explain how water is used in hydroelectric power generation and what are its advantages and disadvantages.
e. Explain how uranium is created and what are its advantages and disadvantages.
03.04 Discuss emerging and alternative electric power generation technologies and fuel sources.
03.05 Explain how solar energy is used to produce electricity in photovoltaic systems and what are its advantages and disadvantages.
03.06 Explain how solar energy is used to produce electric energy using steam and what are its advantages and disadvantages.
03.07 Explain how wind energy is used to produce electric energy and what are its advantages and disadvantages.
03.08 Explain how geothermal energy is used to produce electric energy and what are its advantages and disadvantages.
03.09 Explain how biomass energy is used to produce electric energy and what are its advantages and disadvantages.
03.10 Explain how ocean wave energy is used to produce electric energy and what are its advantages and disadvantages.
03.11 Discuss pros and cons of various energy producing technologies and fuels in the electrical infrastructure (including fossil, nuclear and emerging alternative energy systems).

04.0 Understand electric power transmission-- the student will be able to:

04.01 Explain the electric power transmission process.
04.02 Discuss the application of different electric power transmission principles (including AC vs. DC).
04.03 Name electric power transmission equipment and systems.
04.04 Discuss the emerging technologies in electric power transmission (including Smart Grid).
04.05 Explain ownership/governance of the electric transmission system.

05.0 Understand electric power distribution-- the student will be able to:

05.01 Explain the electric power distribution process.
05.02 Discuss the need for electric distribution systems and how they are designed to operate.
05.03 Name electric power distribution system equipment and what the various components do.
05.04 Discuss the emerging technologies in electric power distribution, including distribution automation and SmartGrid systems.

06.0 Identify and describe careers and entry requirements-- the student will be able to:

06.01 Describe entry-level careers available in energy generation, transmission, distribution and the education/experience requirements for entry into those positions, along with career development and advancement opportunities from those positions.
06.02 Identify entry-level careers available in business and corporate support functions of the energy industry**;** describes the education/experience requirements for entry into those positions, and career advancement opportunities from those positions.
06.03 Describe general wage/salary, benefits, and other advantages of careers in the energy industry.
06.04 Explain the educational pathways available to gain training necessary for entry into energy careers at secondary and post-secondary levels (Partner to create Energy Education Portal).

07.0 Evaluate and analyze energy 'hot topics'-- the student will be able to:

07.01 Energy "Hot Topics"
07.02 Describe energy efficiency/conservation
07.03 Describe alternative energy (wind, solar, biomass, geothermal)
07.04 Describe emerging technologies (wave, algae, IGCC, clean coal, etc.)
07.05 Describe SmartGrid and Time of Use technologies
07.06 Describe key energy regulatory topics (cap and trade, etc.) efficiency, cost, etc.).

Energy Industry Fundamentals Certificate

What is the *Energy Industry Fundamentals* Certificate?

Developed by the Center for Energy Workforce Development, CEWD is a non-profit consortium of electric, natural gas, and nuclear utilities and their associations - Edison Electric Institute, American Gas Association, Nuclear Energy Institute, and National Rural Electric Cooperative Association. CEWD was formed to help utilities work together to develop solutions to the coming workforce shortage in the utility industry. One solution is to fill a gap in industry training. While there are occupation-specific credentials in the energy industry, there is no credential that ensures potential workers gain an understanding of the industry as a whole to make occupation-specific training more meaningful and to understand how one's company (once hired) fits into the big picture. In many instances, utilities end up having to provide this training after employees are hired. This philosophy of learning the basics before occupational training aligns with the energy industry competency model. See the pyramid below.

How is it structured?

Energy Industry Fundamentals is divided into modules. In order to receive the credential, all modules must be completed, and students must take and pass an assessment. The modules for the program include:

- Basic and emerging principles and concepts that impact the energy industry
- Compliance with procedures necessary to ensure a safe and healthy work environment
- Electric power generation

- Electric power and natural gas transmission
- Electric and natural gas distribution
- Energy careers and entry requirements
- Energy 'hot topics' (such as Smart Grid technologies)

What are the benefits to utilities?

The Energy Industry Fundamentals course, for which the credential is based, takes a comprehensive look at the energy industry, including nuclear, natural gas, and renewable. Instructor guides and student materials are provided as part of the program, focusing on experiential learning techniques with a comprehensive online assessment at the end of the course. Students will be required to pass the assessment to receive the certificate.

There is no other credential that ensures potential workers have an understanding of the industry as a whole. This training/credential helps make occupation-specific training more meaningful, and enables students to understand how one's company (once hired) and job fits into the big picture.
In many instances, utilities end up having to provide this training after employees are hired.

What are the benefits to students?

Since CEWD is a coalition made up of energy companies, this credential is being created by the industry for the industry. This ensures that students are learning the right material that will help them succeed at their jobs.

What is required of schools to issue the credential?

CEWD is seeking accreditation from the American National Standards Institute (ANSI) for assessment-based certificate programs. Therefore, there will be a set of requirements for organizations offering the course to lead to the credential. CEWD is in the process of setting up the administration of the credential as well as developing the materials, so these requirements will be available once accreditation is received. This accreditation will ensure the quality and integrity of the certificate.

Energy Industry Fundamentals Recognition Commitment

CEWD was formed to help the energy industry work together to develop a skilled, diverse workforce for the future. Through this effort, CEWD has developed a stackable credentialing framework and has identified specific credentials that measure the skills and competencies of potential applicants.

Tiers 4 and 5 of the Energy Competency Model identify specific competencies that relate to how the industry is organized and operates as a whole. Although there was curriculum for some competencies in those tiers, there was no comprehensive curriculum or credential that ensures potential workers gain a foundational understanding of the industry. CEWD, with its member companies, has now developed the Energy Industry Fundamentals curriculum, assessment and credential

The Energy Industry Fundamentals course, for which the credential is based, takes a comprehensive look at the energy industry, and all fuel types including fossil, nuclear, natural gas, and renewable. Instructor guides and student materials are provided as part of the program, focusing on experiential learning techniques with a comprehensive online assessment at the end of the course. Students will be required to pass the assessment to receive the certificate. There is no other credential that ensures potential workers have an understanding of the industry as a whole. The curriculum can be taught at both the secondary and post-secondary education levels.

Commitment:

The company below recognizes the Energy Industry Fundamentals Certificate as an industry credential that adds value for both the student and the company, and indicates that the bearer of the certificate has a foundational knowledge and understanding of the utility industry.

_____ _____

Signature Company Name

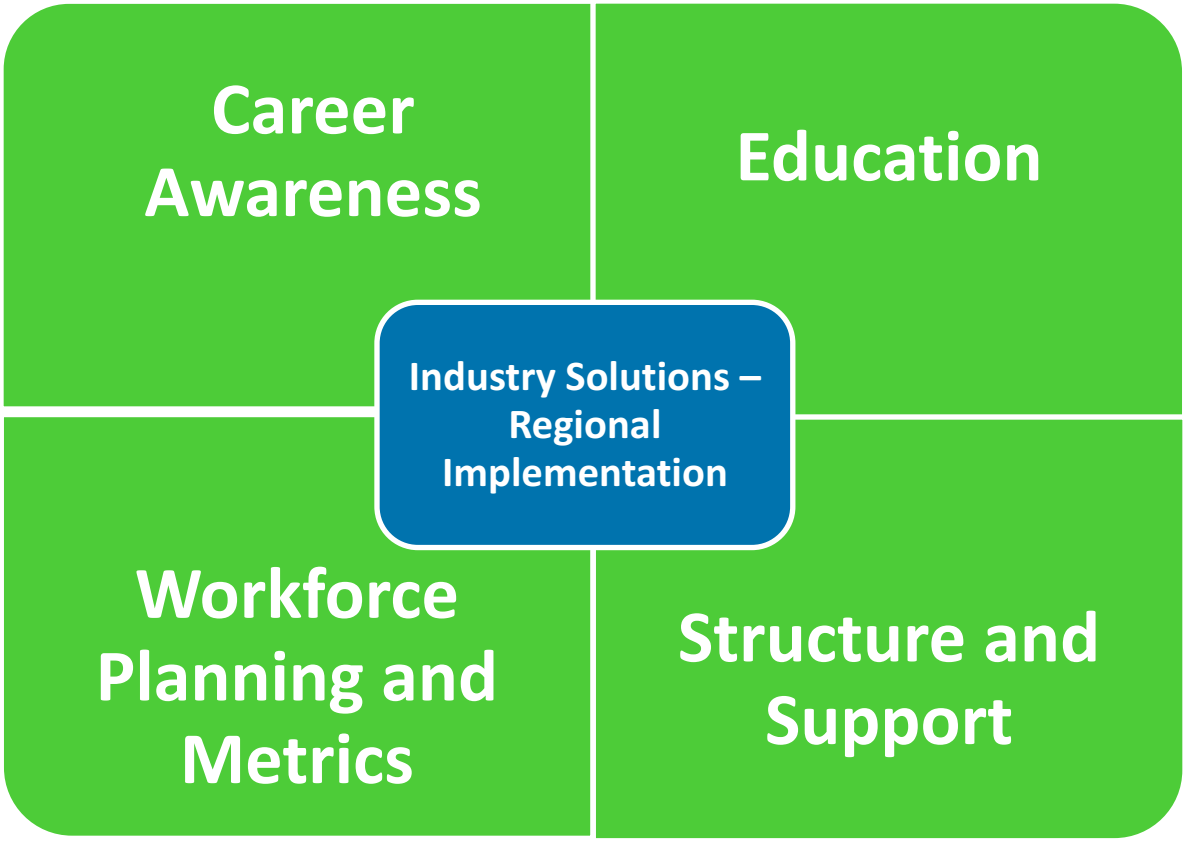
Center For
ENERGY
Workforce Development

Industry Solutions–Regional Implementation

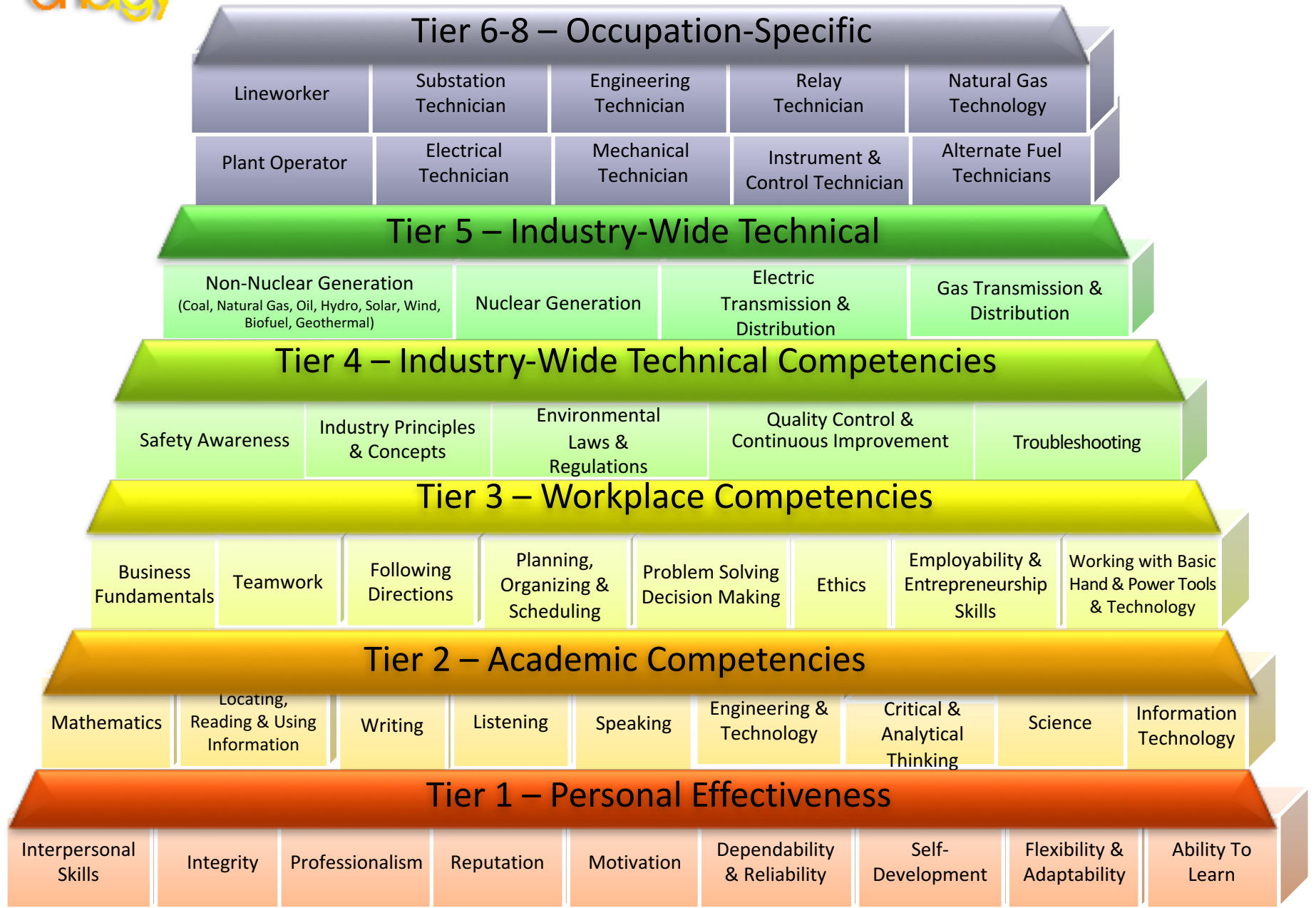
Get Into Energy Career Pathways Credentials

CEWD Mission

Build the alliances, processes, and tools to develop tomorrow's energy workforce



Energy Competency Model: Generation, Transmission & Distribution



Training/Credential Components

Tier 6–8 Job Specific Skills/Credentials

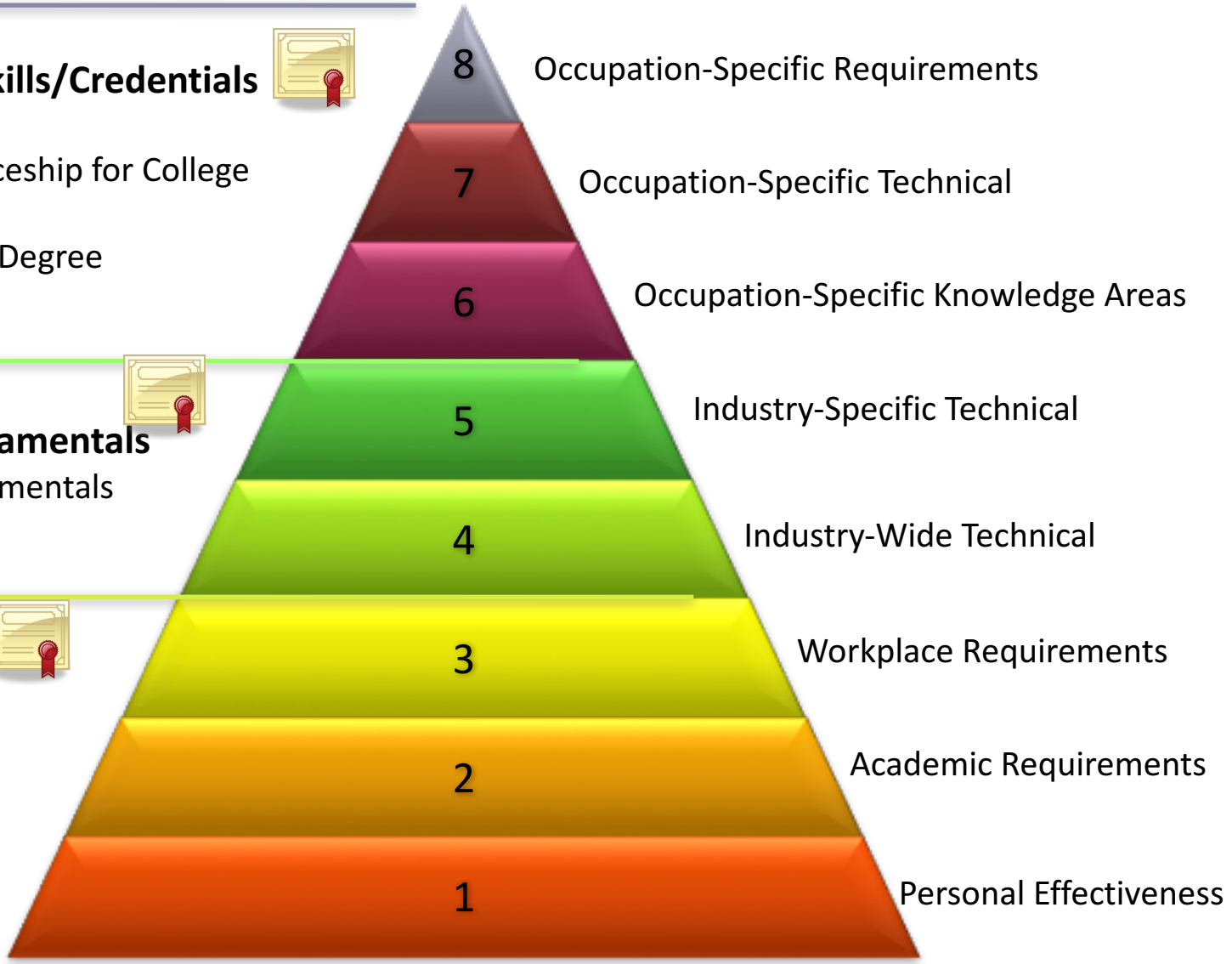
- Associate Degree
- Boot Camp / Apprenticeship for College Credit
- Accelerated Associate Degree

Tier 4–5 Industry Fundamentals

- Energy Industry Fundamentals Certificate

Tier 1–3 Basic Training

- Energy Industry Employability Skills Certificate
- National Career Readiness Certificate



Energy Competency Tier Model for Skilled Technician Positions in Energy Efficiency, Energy Generation and Energy Transmission and Distribution

What is Energy Industry Fundamentals?

- EIF provides:
  - A broad understanding of the electric and natural gas utility industry.
  - Course includes the following modules:
    - Basic and emerging principles and concepts that impact the energy industry
    - Compliance with procedures necessary to ensure a safe and healthy work environment
    - Electric power generation
    - Electric power and natural gas transmission
    - Electric and natural gas distribution
    - Energy careers and entry requirements
    - Energy ‘hot topics’ (such as Smart Grid technologies)

Energy Industry Fundamentals

Why an Energy Industry Fundamentals Certificate?

- There is no other credential that ensures potential workers have an understanding of the industry as a whole.
  - This training/credential helps make occupation-specific training more meaningful, and
  - Enables students to understand how one's company (once hired) and job fits into the big picture.
- In many instances, utilities end up having to provide this training after employees are hired.

Energy Industry Fundamentals

- Benefits to Students:
  - Learning the right material that will help them succeed at their jobs.
  - Material was created by industry for industry
- Benefits to Employers:
  - Applicants who understand how the industry works and how jobs fit into the big picture
  - Validation that the applicant has a fundamental understanding of the energy industry.

Energy Industry Fundamentals

- CEWD is seeking accreditation from the American National Standards Institute.
- A set of requirements have been developed for organizations offering the course to lead to the credential.
- Curriculum is available at no cost on our curriculum sharing site – However, only approved providers may offer the course that leads to a credential.

Energy Industry Fundamentals

- EIF as an industry recognized credential
  - The company recognizes the Energy Industry Fundamentals Certificate as an industry credential that adds value for both the student and the company, and indicates that the bearer of the certificate has a foundational knowledge and understanding of the utility industry.

get into energy

Center For ENERGY Workforce Development

For more information, contact:

Ann Randazzo
Center for Energy Workforce Development
ann@cewd.org
www.cewd.org

Formed in March 2006, the Center for Energy Workforce Development (CEWD) is a non-profit consortium of electric natural gas and nuclear utilities and their associations —Edison Electric Institute, American Gas Association, Nuclear Energy Institute, and National Rural Electric Cooperative Association. CEWD was formed to help utilities work together to develop solutions to the coming workforce shortage in the utility industry. It is the first partnership between utilities, their associations, contractors and unions to focus on the need to build a skilled workforce pipeline that will meet future industry needs.

Center For
ENERGY
Workforce Development

701 Pennsylvania Ave., N.W.
Washington, D.C. 20004-2696
Ph: 202-638-5802
www.cewd.org