Stronger Together with Energy Education

June 17, 2025

get into energy

WITH THE CENTER FOR ENERGY WORKFORCE DEVELOPMENT

Agenda

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- Energy & Natural Resources National Career Cluster Update
- Content Standards
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  - Secondary (Grades 9-12)
  - Post-Secondary (Adult)
- EIF 2.0 Overview
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- NCCER Energy Core
- Open Discussion
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Briefing

CEWD
Center for Energy Workforce Development

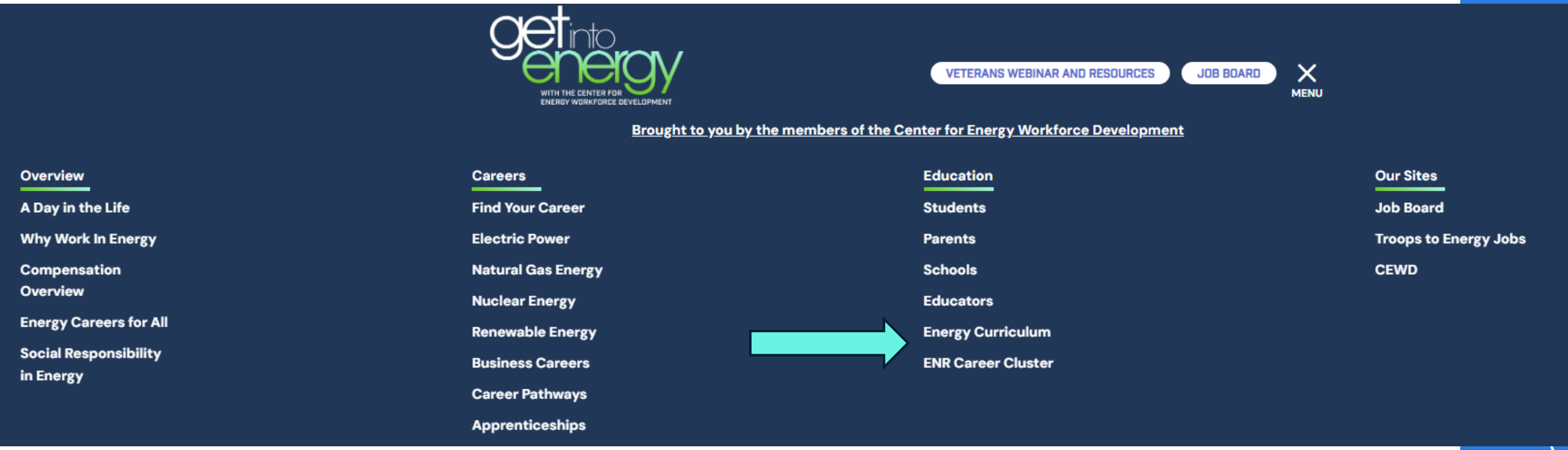
- We represent the diverse interests of the entire energy sector and serve as the first stop for information, collaboration, leadership, and resources for workforce planning, recruitment, development and retention.

get into energy

A thriving energy workforce powering our nation.

- Career awareness and promotion
  - Raising awareness, inspiring interest and attracting new candidates to energy careers through targeted outreach and engagement.
- Leadership for workforce development
  - Serving as the leading resource for tools and strategies to help develop and retain the industry's talent pipeline.
- CEWD member success
  - Enhancing member value through high-impact services, leadership opportunities and collaboration.

GIE Menu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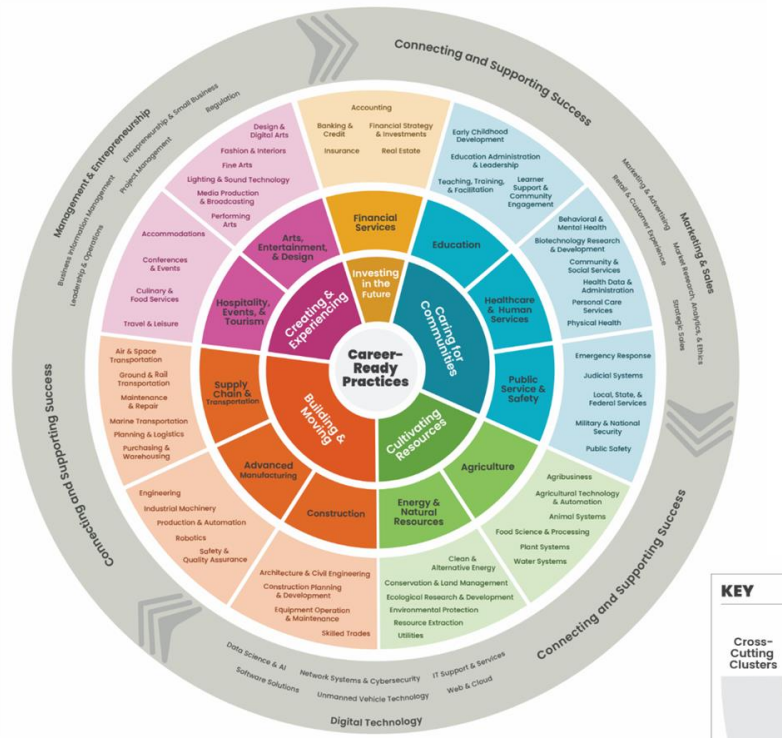
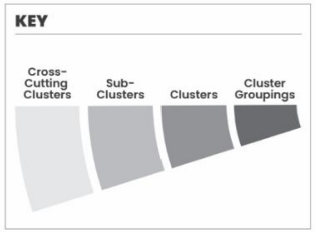
WITH THE CENTER FOR ENERGY WORKFORCE DEVELOPMENT
VETERANS WEBINAR AND RESOURCES
JOB BOARD
MENU
Brought to you by the members of the Center for Energy Workforce Development
Overview
A Day in the Life
Why Work In Energy
Compensation Overview
Energy Careers for All
Social Responsibility in Energy
Careers
Find Your Career
Electric Power
Natural Gas Energy
Nuclear Energy
Renewable Energy
Business Careers
Career Pathways
Apprenticeships
Education
Students
Parents
Schools
Educators
Energy Curriculum
ENR Career Cluster
Our Sites
Job Board
Troops to Energy Jobs
CEWD

National Career Clusters

The Framework: Wheel View



The Framework: Grid View



CULTIVATING RESOURCES

COUNCIL
A national partnership for excellence in agriculture and education.

Center for Energy Workforce Development

FFA

Energy and Natural Resources
CAREER CLUSTER

get into energy

For 2025 and beyond...

Energy and Natural Resources
CAREER CLUSTER

Click here to visit ENR Career Cluster

The Cluster Defined

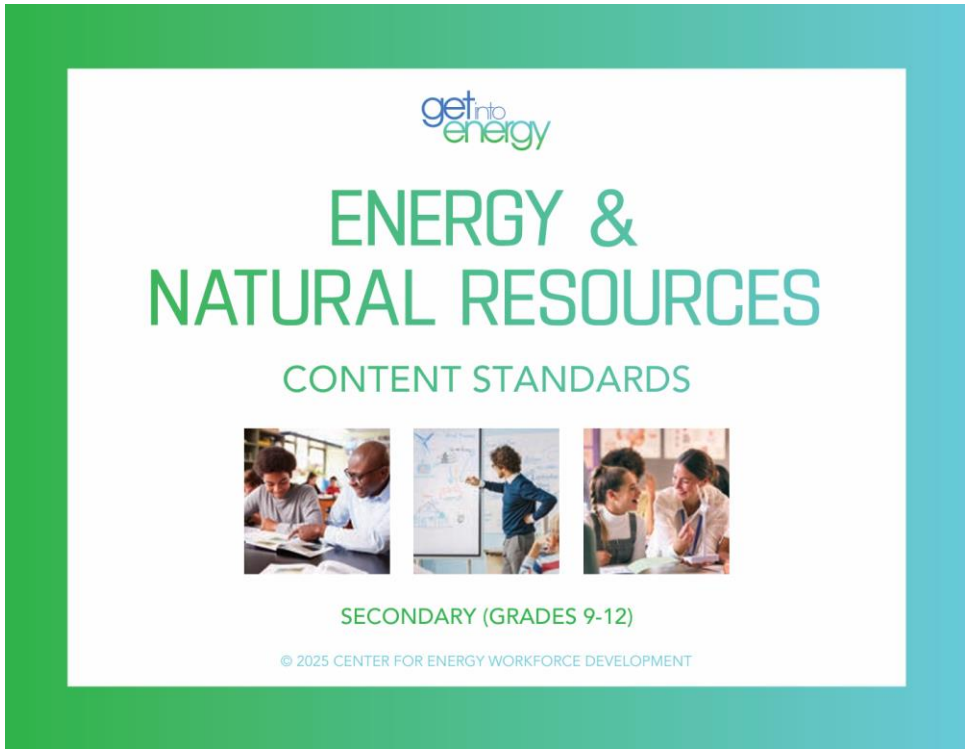
The Energy & Natural Resources Career Cluster spans careers in traditional and renewable fuel production, power generation and energy conversion, utilities, environmental preservation, ecological research, and resource extraction. These industries focus on efficient and responsible resource management, including conservation, transmission, distribution and storage, to minimize environmental impacts and meet global energy needs. Careers in this Cluster are dedicated to creating a sustainable future, innovating cleaner energy solutions, and preserving our planet's natural resources for generations to come.

Energy & Natural Resources: *Powering Progress and Preserving Our Planet*

Cluster Definition: The Energy & Natural Resources Career Cluster spans careers in traditional and renewable fuel production, power generation and energy conversion, utilities, environmental preservation, ecological research, and resource extraction. These industries focus on efficient and responsible resource management, including conservation, transmission, distribution and storage, to minimize environmental impacts and meet global energy needs. Careers in this Cluster are dedicated to creating a sustainable future, innovating cleaner energy solutions, and preserving our planet's natural resources for generations to come.

Sub-Clusters	Example Programs of Study
Clean & Alternative Energy: Careers focused on energy generation and infrastructure development from clean energy sources such as low carbon fuels, natural gas, nuclear, biofuels, hydrogen processes, and other alternative sources aimed at addressing climate change impacts. Professionals in this field develop and implement technologies that harness natural elements including solar, nuclear, wind, and hydro power, while advancing efforts in electrification and energy storage solutions. This Sub-Cluster also includes recycling of batteries and waste, carbon capture, and other energy and mineral reuse and reclamation.	Renewable Energy Electric Vehicle Installation & Maintenance Solar System Design & Installation Wind Turbine Installation & Maintenance
Conservation & Land Management: Careers rooted in environmental and natural sciences, focusing on protecting and managing natural resources and landscapes. Professionals in this field operate local, state, and national parks; safeguard forests and waterways; maintain national lands and rangelands; and manage wildlife and marine life. This field merges ecological conservation with recreational spaces, aiming to preserve nature while enhancing community well-being and environmental stewardship through public accessibility.	GIS Mapping Natural Resource Conservation Wildlife Management
Ecological Research & Development: Careers emphasizing the scientific study of and research in ecological, geological, electrical, chemical, nuclear, biological, environmental engineering, and other sciences as they relate to energy production, sustainability, and the management of natural resources. Professionals in this field employ scientific methods to understand ecosystems, biodiversity, and the impacts of energy systems on the environment.	Environmental Engineering Environmental Management Environmental Science & Sustainability
Environmental Protection: Careers centered on regulating and managing the impacts of both natural processes and human activities, such as resource production and consumption. This Sub-Cluster involves developing and enforcing policies to protect all ecosystems, including space, air, land, and water, from natural disasters, pollution, and degradation. This field focuses on conserving natural habitats and biodiversity and applying scientific and engineering principles to solve environmental problems and improve climate resilience.	Climate Resilience Sustainable Communities
Resource Extraction: Careers focused on the efficient extraction of natural materials including fossil fuels, minerals, natural gas, and geothermal resources that are essential for fuel production in energy and manufacturing. This Sub-Cluster includes careers in exploration, drilling, mining, fracking, mineral processing, geoscience, quarrying, and petroleum engineering.	Clean Energy System Design Energy Transfer Mining Technology
Utilities: Careers involving the transmission and maintenance of utility systems for clean and alternative energy, electricity, water, waste remediation, and telecom/broadband; distribution and infrastructure development; and storage. Professionals in this field ensure reliable connectivity to energy sources, energy efficiency, and other essential services. Opportunities exist in public utilities, as well as commercial and industrial companies, with a focus on operations, maintenance, and security of systems to guarantee uninterrupted access to vital resources.	Telecommunications Water & Wastewater Systems Plant Operations Underground or Overhead Linework Utility Maintenance and Repair

Content Standards



- Primary (Grades K-8)
- Secondary (Grades 9-12)
- Post-Secondary (Adult)

Primary

ENERGY & NATURAL RESOURCES

COMPETENCIES (GRADES K-8)

Subclusters	Grade Bands	Beginning	Intermediate	Advanced
Energy Foundations	K-2	List the different forms of energy (e.g., light, heat, motion, sound, and growth).	Explain the difference between renewable and nonrenewable energy sources.	Discuss where we see the energy in everyday life.
	3-5	Describe the different sources of energy.	Categorize energy sources according to their forms.	Analyze how people use various energy sources.
	6-8	Identify careers in the energy sector.	Present emerging technologies in the energy sector.	Debate the best new energy technology to implement in your community.
Clean Energy	K-2	Define clean energy.	Explain why some energy sources are called clean.	Compare and contrast two clean energy sources.
	3-5	Define the greenhouse effect.	Compare energy sources based on their level of greenhouse gas emissions.	Illustrate how the greenhouse effect works.
	6-8	Describe how power is generated.	Graph the level of emissions from different power generation sources.	Graph the level of emissions from different power generation sources.

Secondary

ENERGY FOUNDATIONS

Standard: EF.01. Examine foundational energy concepts and career opportunities in the energy industry.

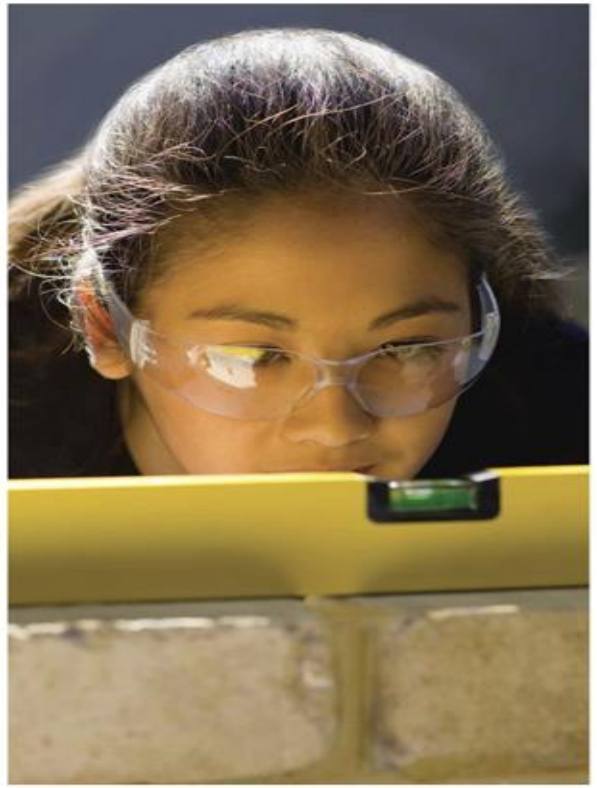
Performance Indicator	Sample Measurements		
	Beginning	Intermediate	Advanced
EF.01.01. Demonstrate an understanding of workplace safety in the energy sector.	**EF.01.01.01.a.** Explain the role of the Occupational Safety and Health Administration (OSHA).	**EF.01.01.01.b.** Follow established safety procedures and guidelines.	**EF.01.01.01.c.** Evaluate various workplace scenarios to identify potential hazards and ways to mitigate risk.
EF.01.02. Understand the relationship between power and energy and how it relates to the production and usage of electricity.	**EF.01.02.01.a.** Define power, energy, force, and work.	**EF.01.02.01.b.** Compare different units for energy and power and their use cases.	**EF.01.02.01.c.** Use dimensional analysis to explain the relationship between the standard units of force, energy, and power.
EF.01.03. Understand the scientific laws that govern electricity.	**EF.01.03.01.a.** Define key terms and scientific laws related to electricity.	**EF.01.03.01.b.** Construct an electrical circuit.	**EF.01.03.01.c.** Modify a circuit to improve efficiency.
EF.01.04. Discuss the history of the United States energy sector.	**EF.01.04.01.a.** List key milestones in the history of the United States energy sector.	**EF.01.04.01.b.** Describe key milestones in the history of the United States energy sector.	**EF.01.04.01.c.** Prioritize key milestones in the history of the United States energy sector based on their importance.
EF.01.05. Examine various energy sources and their impact on the environment.	**EF.01.05.01.a.** List the primary sources and forms of energy.	**EF.01.05.01.b.** Diagram examples of human-made energy systems from source to end use.	**EF.01.05.01.c.** Compare the efficiency of different methods of electricity production.
	EF.01.05.02.a. Describe the difference between renewable and nonrenewable energy sources.	**EF.01.05.02.b.** Categorize energy sources as renewable or nonrenewable.	**EF.01.05.02.c.** Compare and contrast energy sources based on their impact on the environment.
	EF.01.05.03.a. Explain how greenhouse gases are generated.	**EF.01.05.03.b.** Analyze the impact of greenhouse gases (e.g., carbon dioxide, methane, and nitrous oxide) on the economy and environment.	**EF.01.05.03.c.** Appraise strategies for reducing greenhouse gas emissions (fuel-efficient vehicles, energy conservation marketing campaigns, regulations, incentives, etc.).
EF.01.06. Examine career opportunities in the energy sector.	**EF.01.06.01.a.** Describe the diversity of careers in the energy sector.	**EF.01.06.01.b.** Discuss the attributes of different energy career pathways of interest.	**EF.01.06.01.c.** Analyze careers in the energy industry by assessing factors such as total compensation (including salary and benefits), education and training requirements, and working conditions aligned with career goals.

Post-Secondary

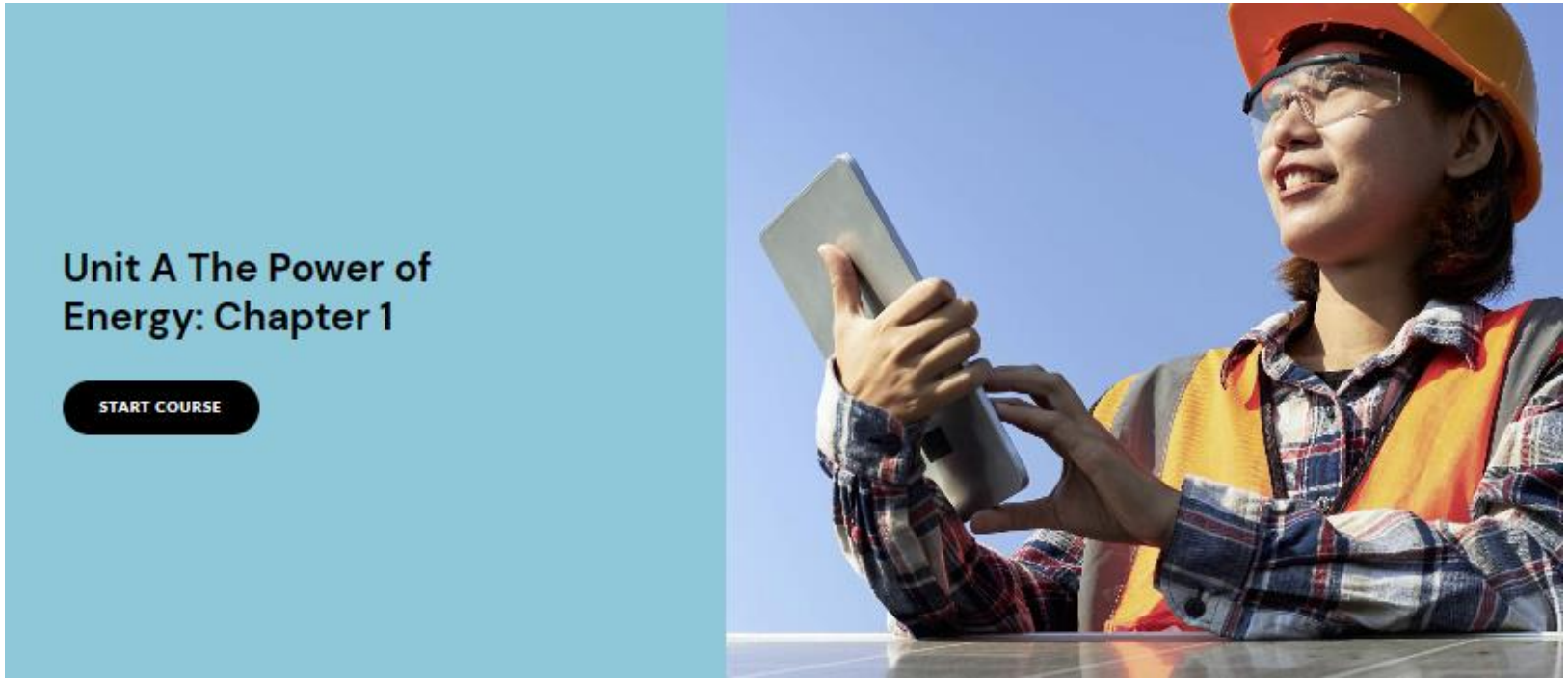
SKILLED TRADES

The following competencies describe the skills and knowledge for postsecondary skilled trades pathways in the energy and natural resources sector.

1. Demonstrate workplace safety including utilizing personal protective equipment as appropriate.
2. Discuss the basic employability skills needed for success in a skilled trades career and create a personal development plan and resume aligned with career goals.
3. Demonstrate basic communication skills, including reading, speaking, listening, and writing.
4. Apply mathematics knowledge to plan and carry out tasks.
5. Interpret construction-related drawings.
6. Identify, select, use, and maintain hand and power tools properly.
7. Utilize critical thinking strategies to collect, analyze, and interpret data to perform troubleshooting.
8. Identify and describe careers, job requirements, and training opportunities within the energy and natural resources sectors.
9. Demonstrate competency in a specific skilled trade.



EIF 2.0 Updates



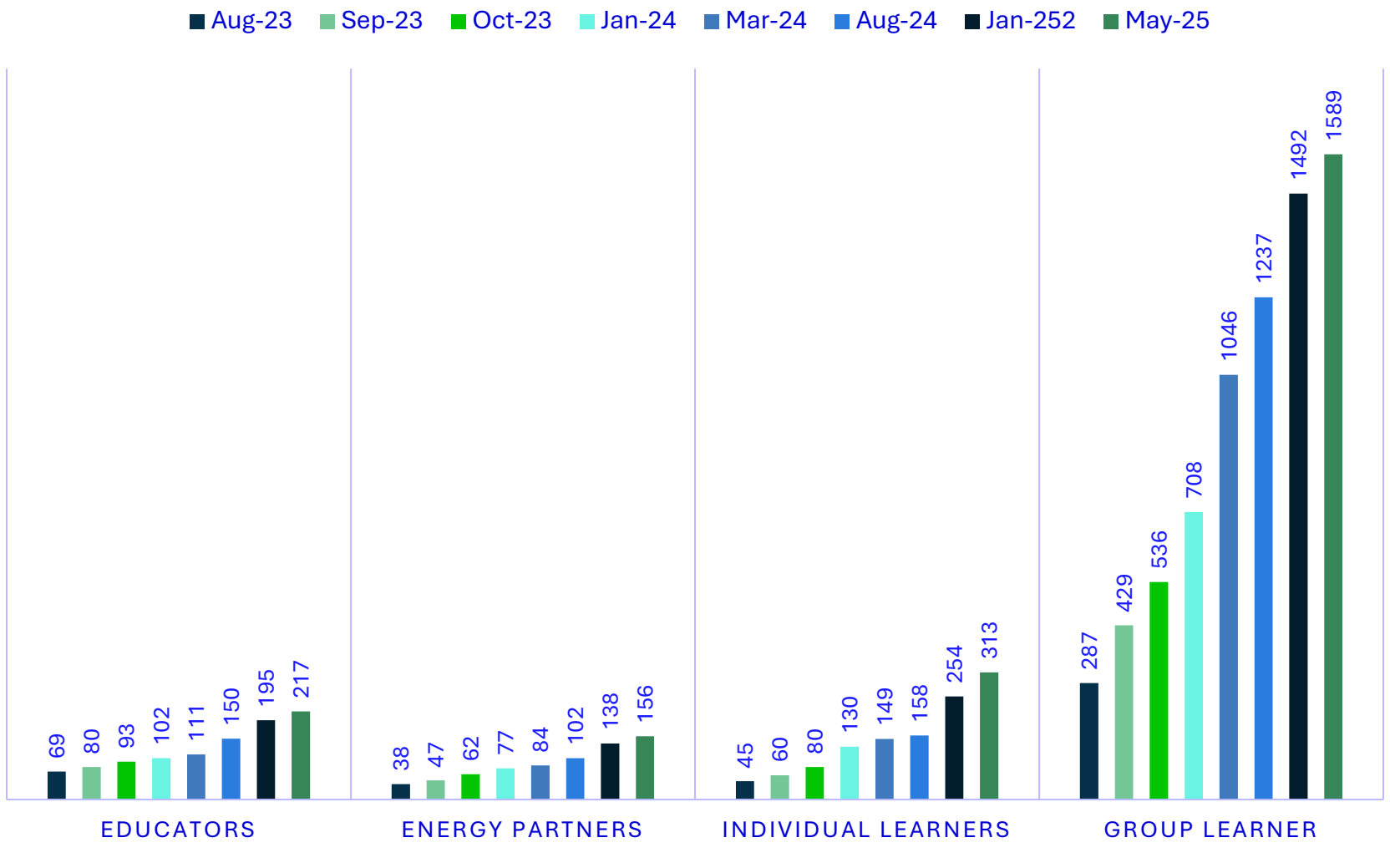
- Bonus Modules

Architecture

Unit A: The Power of Energy	Unit B: The Evolution of Energy	Unit C: Our Interconnected Energy System	Unit D: Show Me the Money
Chapter 1: Get Up to Speed on Energy Careers and Concepts	**Chapter 5:** The Past, Present, and Future of Energy	**Chapter 9:** The Power Transmission System	**Chapter 13:** How Bills Come Together
A.1.1 Find Your Exceptional Field in Energy **A.1.2** What Exactly is Energy Anyway? **A.1.3** Here's Why Energy is Important **A.1.4** Energy Efficiency Everywhere **A.1.5** Energy Systems are Ecosystems **A.1.6** Getting Real About Workplace Safety **A.1.7** Organizations that Prioritize Safety **A.1.8** Good Regulations Do Great Things	**B.5.1** Electric Revolution: From Lightning to Current War **B.5.2** The First Energy Companies **B.5.3** The Rapid Expansion of Electricity Service	**C.9.1** The Lowdown on High-Voltage Transmission **C.9.2** Power Transmission Lines, Towers and Transformers **C.9.3** Electric Transmission System Challenges and Opportunities	**D.13.1** Breaking Down Bills **D.13.2** Deciphering the Fine Print **D.13.3** Distributed Generation: Behind-the-Meter Systems
Chapter 2: Fueling Our Energy Future	**Chapter 6:** Companies that Power America	**Chapter 10:** Our Power Distribution System	**Chapter 14:** Policies and Politics in Practice
A.2.1 What Are the Facts on Fuels? **A.2.2** Where Generation Meets Demand	**B.6.1** Utilities and Agencies With Power **B.6.2** Case Study: North Carolina **B.6.3** Clearing the Air: Energy and Pollution	**C.10.1** Introduction to the Distribution System **C.10.2** Distribution System Components **C.10.3** Maintenance and Safety: Make It A Priority	**D.14.1** Public Policy and the Energy Industry **D.14.2** Demand-Side Management and Distributed Energy Storage
Chapter 3: The Technologies that Generate Electricity	**Chapter 7:** Keeping the Grid Reliable and Safe	**Chapter 11:** The Pivotal Role of Natural Gas	**Chapter 15:** Energy Careers and Energy Justice
A.3.1 Steam-Electric Power Basics **A.3.2** Natural Gas **A.3.3** Coal **A.3.4** Nuclear **A.3.5** Wind **A.3.6** Hydroelectric **A.3.7** Solar Photovoltaics (PV) **A.3.8** Biomass and Biogas **A.3.9** Geothermal	**B.7.1** Power Players: FERC, NERC, and the IEEE **B.7.2** What is Deregulation?	**C.11.1** Natural Gas Production, Transmission and Distribution **C.11.2** Natural Gas Direct Use, Power Generation and Future Innovation	**D.15.1** Building Your Career in Energy **D.15.2** Career Pathways in the Energy Industry **D.15.3** Equity and Energy Justice
Chapter 4: Our Generation's Energy Trends	**Chapter 8:** The Future of Energy Companies	**Chapter 12:** The Drive for Grid Modernization	**Chapter 16:** Bringing it All Together
A.4.1 Ch-ch-ch-ch-changes **A.4.2** Emerging Fuel: Hydrogen **A.4.3** Emerging Fuel: Marine Energy **A.4.4** Energy Storage Systems (ESS)	**B.8.1** The Business of Energy **B.8.2** Business Case Studies: Constellation and Exelon **B.8.3** Rebalancing the Carbon Cycle	**C.12.1** Risks to Our Energy Infrastructure **C.12.2** The Grid Expansion Imperative **C.12.3** What's So Smart About a Smart Grid?	**D.16.1** Unit A Comprehension Review **D.16.2** Unit B Comprehension Review **D.16.3** Unit C Comprehension Review **D.16.4** Unit D Comprehension Review

EIF 2.0 Registrations

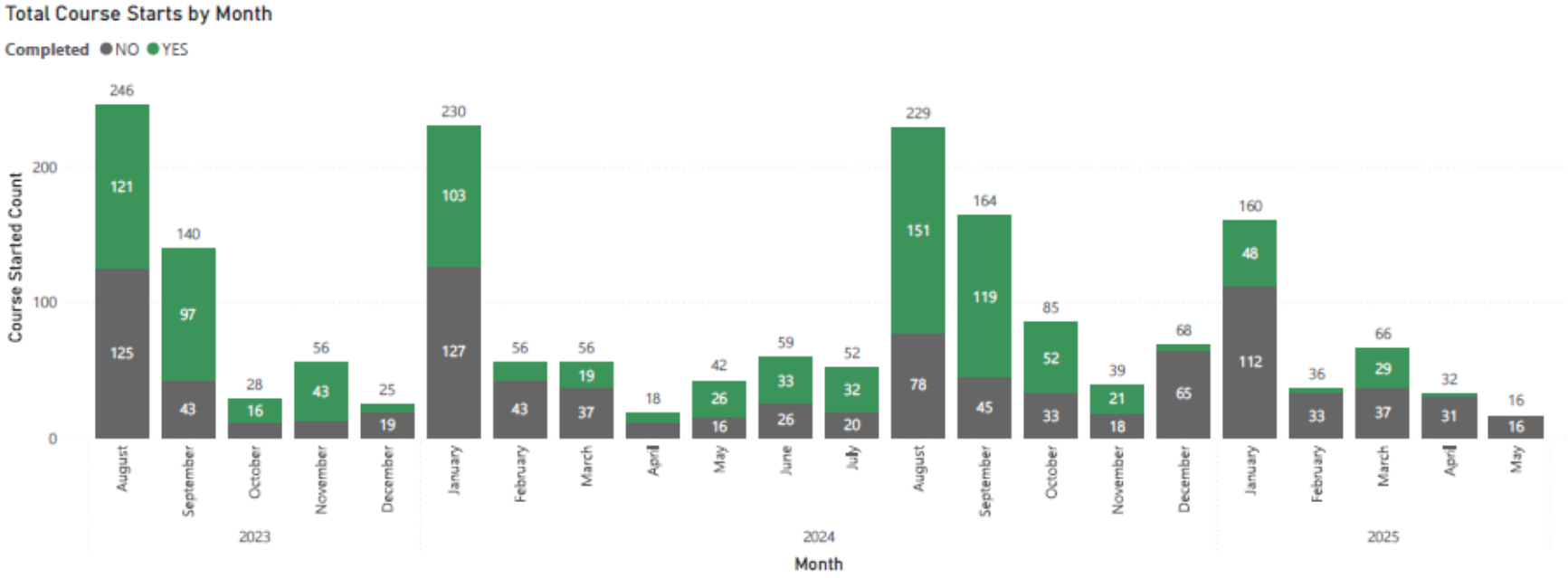
ANNUAL PROGRESS



Monthly Course Starts (Gray) vs. Completions (Green)

1902
TOTAL STARTED

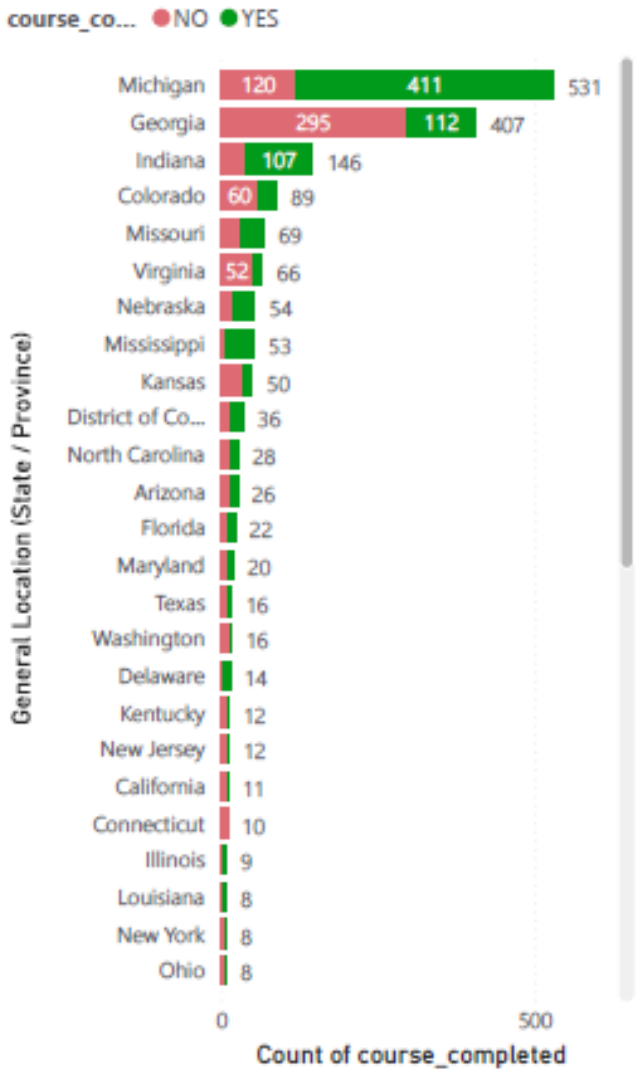
941
TOTAL COMPLETED



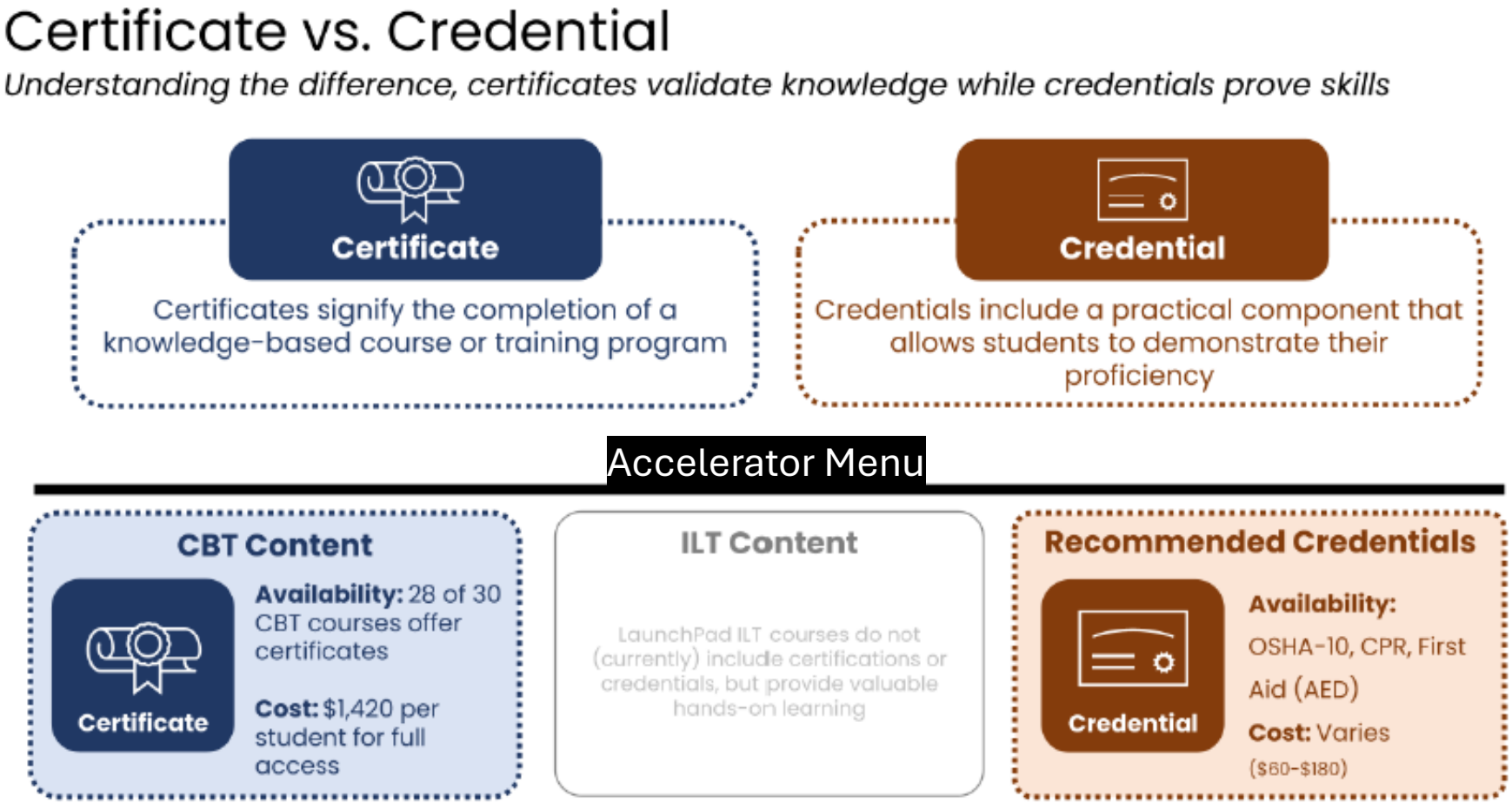
Locations of Students

Count of Created By (User Id) by General Location (State / Province)

Count of course_completed by General Location (State / Province) and course_completed



Accenture Project – Part I Accelerator



Accenture Project – Part II

Energy Connector

- Educator
  - Guest Speaker
  - Lab Resources
  - Equipment Donation
  - Field Trip
  - Externship
  - Career Fair
  - Monetary Donation

Aka “Match.com”

- Energy Partner
  - Location
  - Time
  - Talent
  - Treasure

NCCER MOU

CEWD is collaborating with the National Center for Construction Education & Research (NCCER) to develop and deploy Energy Core, digitally accessible ENR curriculum

Partnership Goals

- Energy Core would be based off nationally recognized "Construction Core"
- Energy Core would be hosted on NCCER's LMS
- Create industry recognized credentials

Benefits

- NCCER has established accreditation capabilities
- Widely recognized brand name
- Well-rooted training network
- Learner traceability platform

STAY TUNED FOR MORE DETAILS COMING SOON

Questions?

Kristie Kelley, M.Ed.
Workforce Development Director
Kristie@cewd.org
850-549-1298

- How can CEWD help you?

Resources will be released on the GIE website by August

- Thank you!

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WITH THE CENTER FOR ENERGY WORKFORCE DEVELOPMENT

Panel Discussion

Chuck Fowlkes
Randolph Career Technical Center/ DPSCD - Panelist

Jamie Vandenburgh
Jackson College - Panelist

Kristie Kelley, CEWD - Moderator