



U.S. DEPARTMENT OF
ENERGY

Battery Workforce Initiative (BWI)

NAATBatt2024

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Director, Office of Energy Jobs



Number of jobs announced in advanced battery manufacturing industry



Clean energy jobs expected thanks to Inflation Reduction Act

Jobs by sector, announced since IRA passage

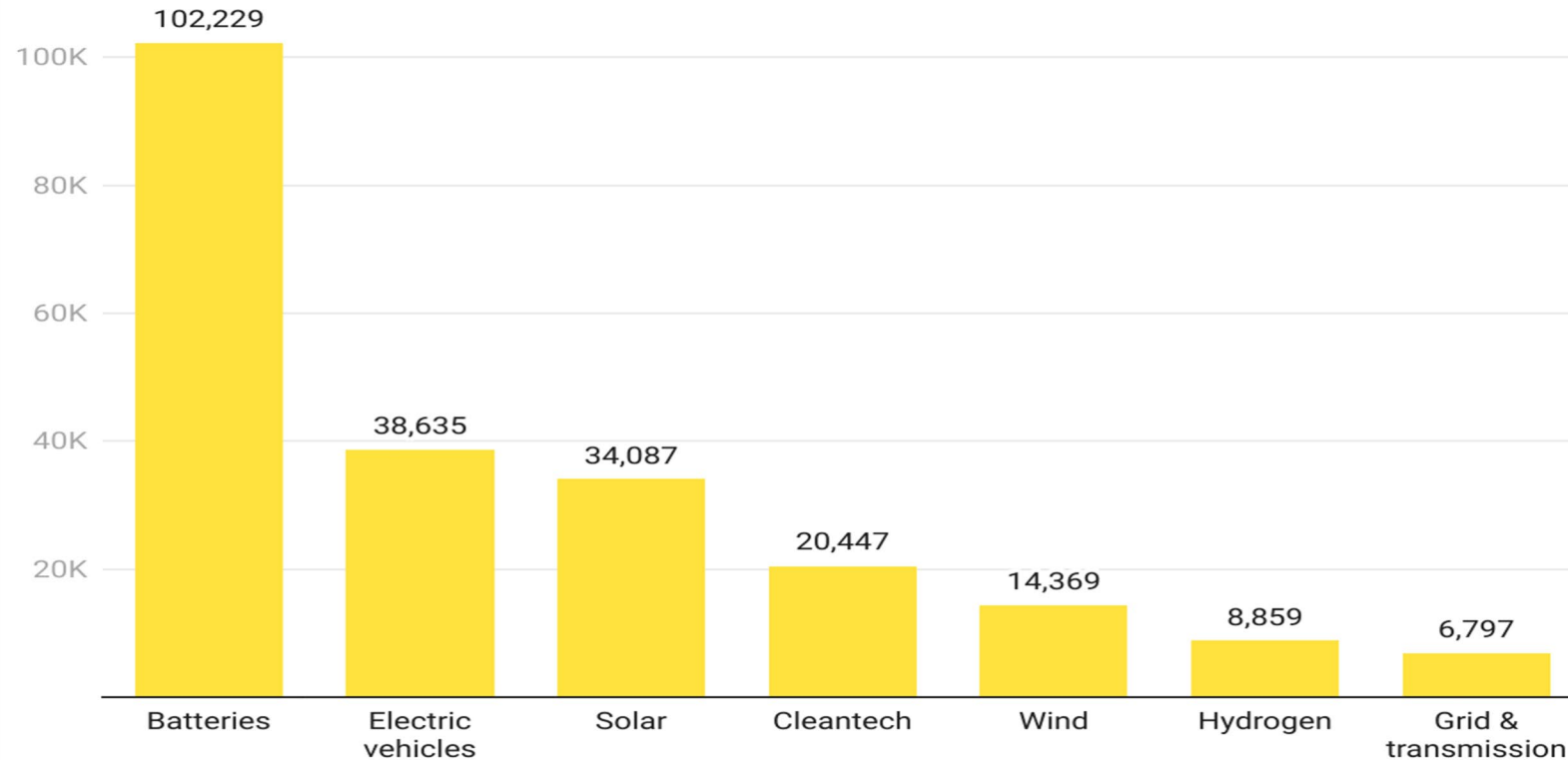


Chart: Canary Media • Source: Climate Power, Clean Energy Boom, September 2023



Creation of BWI



Challenge

Battery manufacturing is projected to **grow nearly 20x by 2021** and 2030,* creating unprecedented demand for skilled workers.

In advanced manufacturing, there is no coherent national system for workforce development.

Each employer is on their own, driving excessive competition for skilled workers in the labor market.

**Source: DOE's VTO*

Strategic Solution



Broad collaborative approach to battery workforce development.



Develop national training guidelines leading to industry-recognized credentials.



Unleash workforce funding from the Department of Labor to support the rapid growth of this industry.



Grow the pool of capable workers who have skills that are responsive to the needs of employers.

BWI by the Numbers: Industry Consensus



14 months

Since kickoff

\$5 million

Commitment by DOE

22 employers

Engaged (and growing)

2 dozen+

*Industry roundtables
and 1:1 meetings*

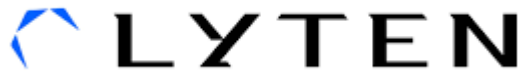
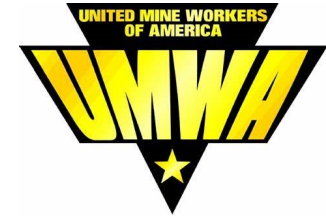
**3 federal
agencies**

Working in partnership

**5 community
colleges**

Visited or consulted





Content of the Job Training Program Guidelines and Testing



Job task analysis: **skills and knowledge requirements** for each occupation



Curricula: **classroom lessons and on-the-job** training guidelines



Pilots and validation: **testing** at 3-5 employers to confirm effectiveness



Job Task Analysis



Responsibility	Task	Level 1	Level 2	Level 3	Level 4
Understanding electronic symbols and schematics	Design analog circuits for various types of equipment.		x	x	x
	Design digital circuits for various types of equipment.		x	x	x
	Understand any symbols related to industrial (420 volt) systems.	x	x	x	x
	Interpret Ladder Diagrams.		x	x	x
	Interpret Logic Diagrams.		x	x	x
	Read various control schematics.	x	x	x	x
	Understand concepts of Programmable Logic.		x	x	x
	Assist in updating flow charts, schematics and electrical diagrams as changes are made.		x	x	x
Revising software for PLCs and other electronic control units	Use laptop computer to diagnose faults.		x	x	x
	Work with engineering and operators to determine new program requirements.		x	x	x
	Design programs to reflect changes in mechanical operation of machines.		x	x	x
	Install new program interfaces.			x	x
	Update software programs.		x	x	x
	Update ladder diagrams.		x	x	x
	Update structured text instructions.		x	x	x
	Update sequential function charts.		x	x	x
Installing and repairing hardware for operator computer terminals	Test software for proper operation.		x	x	x
	Troubleshoot and correct software.		x	x	x
	Adjust operation of virtual shifts and cams.		x	x	x
	Repair computer monitors.		x	x	x
	Install or remove touchscreens.			x	x
	Install or remove keyboards and mouses.			x	x
	Rewire operator terminals.		x	x	x
	Install new program interfaces.			x	x
Rebuild and upgrade computers.			x	x	
Replace sensors.		x	x	x	
Install software programs on operator terminals.		x	x	x	
Change display views and default settings.	x	x	x	x	

Training Guidelines



Module Title	Estimated Duration & Training Method	Summary of Module	Learning Objectives	Topics/Activities/Hands-On Learning
Electrode Prep: Coating I	3 hours classroom or eLearning & OJT to be determined	<p>This module is the first of four that will focus on the electrode prep stage of the battery production process. This training provides an overview of the cathode coating process and an introduction to the coating machine. An overview of machine parts and their function will comprise the main part of this module. Also included will be a discussion of common machine and production issues and troubleshooting strategies.</p> <p>Participants will receive a demonstration of coating machine operation, including loading, monitoring, and adjustments, and will complete hands-on coating instruction during this module.</p>	<ul style="list-style-type: none"> • Identify the parts of the coating machine and their purpose in the battery production process. • Follow the procedure for operating the machine, including loading materials, monitoring production, and adjusting die settings. • Perform basic troubleshooting of the coating machine. 	<ul style="list-style-type: none"> • Introduction to the coating machine and its importance in the overall production process • Overview of machine parts and their function • Discussion of common machine and production issues and basic troubleshooting of these issues • <i>Quiz on coating machine parts and function</i> • <i>Coating machine operation best practices activity</i> • <i>Demonstration of the machine, including loading, monitoring, and die adjustments</i> • <i>Hands-on coating instruction</i>



BWI Timeline



FEBRUARY

RFP development for training pilots

Virtual roundtable on upstream/recycling occupations

Launch health and safety training committee

MARCH

Community college virtual roundtable

RFP for pilots released

Release training guidelines for cell manufacturing occupations

Q3 2024

RFP responses due

Evaluation and selection of pilots

Site visits for materials processing

Job task analysis for upstream/recycling occupations

Q4 2024

Training Pilots

Finalize and release training guidelines for upstream and recycling occupations



What is Next for BWI!

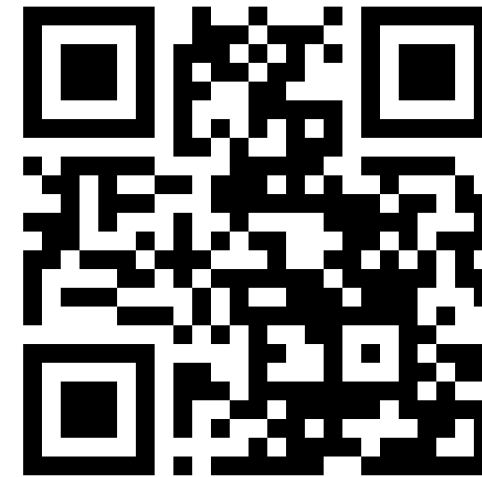


- Establishing a **cohort of education providers** to use the materials and help refine the instructional approach
 - Ask: If you are working with a community college or technical school, send them our way
- Recruiting **upstream materials suppliers and recycling firms** to develop industry workforce standards
 - Ask: If your company makes battery-grade materials, please let us know and come to our kickoff webinar
- Developing a **cell manufacturing safety module**
 - Ask: If you can contribute material or expertise, please let us know and we'll be in touch

BWI Vision for Industry Success



Provide the tools and resources to develop a skilled workforce for a competitive domestic battery industry.



Visit netl.doe.gov/bwi