



Goals and Progress of the Battery Workforce Initiative (BWI)

September 2022 – November 2024

Goals

BWI is charting a national strategy to grow a robust, highly skilled advanced battery workforce.

- BWI is driving collaboration across government, industry, training institutions, and organized labor to address the challenge of building and retaining a high-skilled workforce in advanced battery manufacturing, an industry projected to grow 20x by 2030*.
- This collaboration aims to develop high-quality training models, informed by needs across the industry and labor organizations, in high-growth advanced battery manufacturing occupations.
- BWI's training models aim to equip workers with skills that are valued by employers, ultimately facilitating attention to job quality and retention in the industry and contributing to a strong ROI from workforce investments.
- BWI is charting a concerted strategy to build the workforce of an important part of the domestic clean energy supply chain.



Goals

BWI Goal and Objectives

The goal of BWI is to support the development and success of the workforce, which is indispensable to the success and competitiveness of a growing domestic industry.

This report chronicles the activities of the BWI that are aligned with the goal and objectives.



Kick-start a National Sectoral Workforce Strategy for a Growing Industry

Chart a sectoral strategy to accelerate the growth of a highly skilled advanced battery manufacturing workforce by convening government, industry, organized labor, training institutions, and other workforce stakeholders to support the industry's growing recruitment, education, training, and retention needs.



Develop Industry-Recognized Credentials and Training Materials

Develop a national education and training curriculum that meets the needs of employers and workers by engaging the advanced battery industry employers (to share non-proprietary skills requirements for high-demand occupations) and training experts (to distill common skills and abilities to educational and on-the-job training requirements).



Purpose of the Battery Workforce Initiative (BWI)



Accelerate the development of high-quality training for advanced battery manufacturing workforce.



Convene and collaborate with technical experts across government, industry, labor, and educational institutions to **build consensus** in the development of high-quality training models.



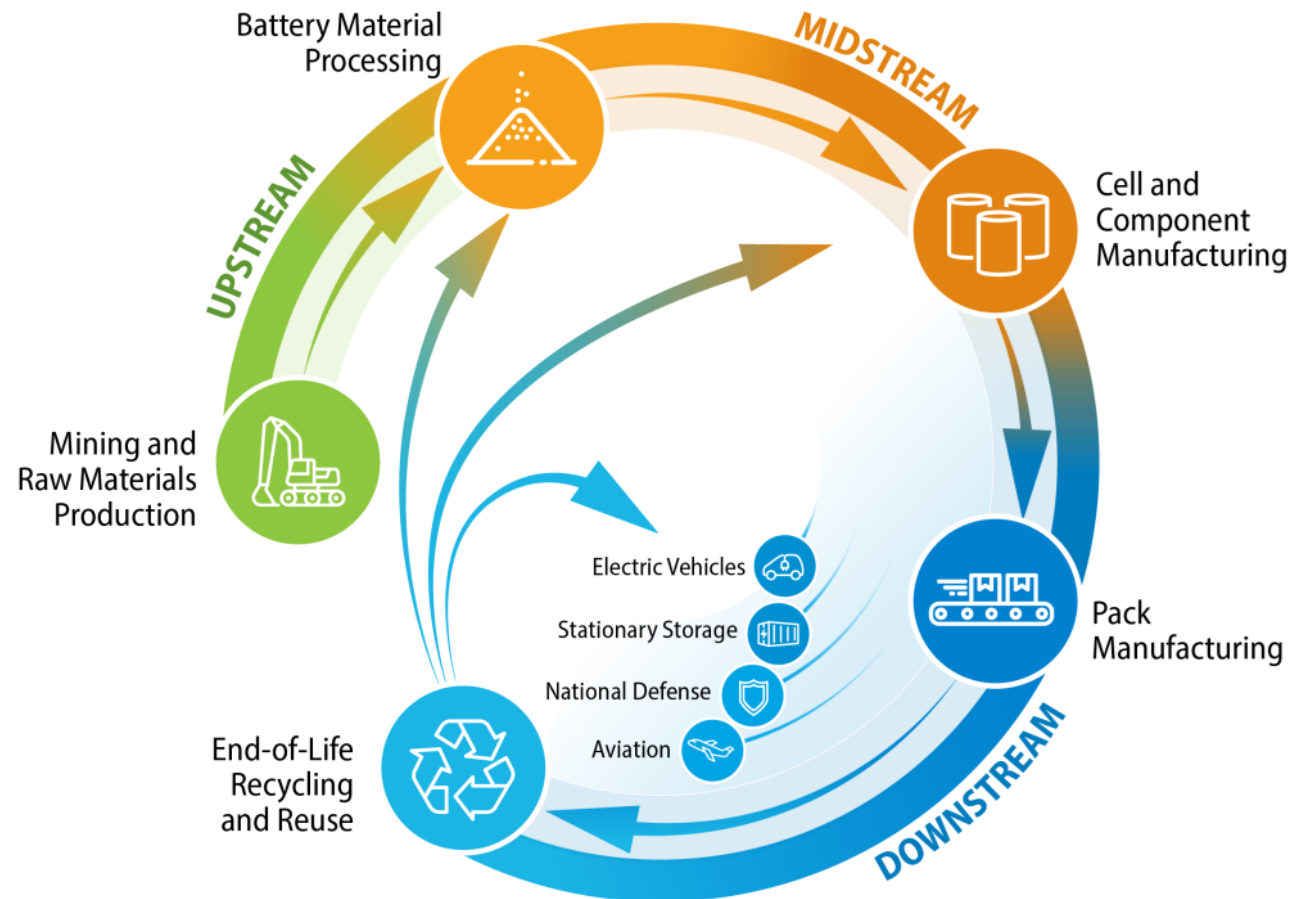
Grow and retain qualified manufacturing workers equipped with skills that employers value and that **support health & safety, efficiency, quality, innovation, and subsequently industry competitiveness.**



Develop national training guidelines for Registered Apprenticeship programs, speeding up access to high-quality training materials that lead to industry-valued credentials.

BWI Footprint Across Advanced Battery Supply Chain

- BWI aims to develop training material for priority occupations across the supply chain.
- The first part of the supply chain BWI focused on was cell manufacturing, developing training materials for battery machine operator.
- Currently, BWI is developing training guidelines for machine repair positions.
- BWI is also focused on end-of-life recycling, material processing, and component manufacturing.



Source: NREL.gov, NAATBatt International

Industry Engagement

Kickoff Event & Stakeholder Meeting (2022)

DOE and the BWI team sponsored a kickoff event and press conference in Detroit, MI that included stakeholders and advanced battery industry leaders who confirmed their commitment to participate in the initiative.

- **22 main table attendees**, including advanced battery and EV manufacturers, the Secretary of Energy and Acting Secretary of Labor, the White House National Economic Council, several U.S. Senators, Michigan Governor's Office, the AFL-CIO, the United Auto Workers, United Mine Workers, and the International Brotherhood of Electrical Workers.
- Extensive coverage by **28 outlets**, including Reuters newswire, Crain's Business, local newspapers, TV newscasts, radio stations, and online publications.



Industry Engagement

1

Convened Stakeholders

Industry leaders attended several virtual roundtables hosted by BWI. These events attracted dozens of advanced battery manufacturers, labor unions, state and federal agencies, and advanced battery production experts.

2

Solicited Input

BWI presented the initiative and solicited input from the industry stakeholders on how to customize effective training guidelines to meet the needs of the emerging industry, focusing on both entry-level workers and upskilling incumbent workers.

3

Applied Feedback

In response to employers' preferences, BWI prioritized training for hourly workers to understand the advanced battery manufacturing process.

Engaged First with Cell Manufacturers

Performed Job Task Analysis for advanced battery cell manufacturing with multiple employers (2023-24)

BWI collaborated with key employers to perform on-site Job Task Analysis (JTA) at advanced battery manufacturing facilities for machine operator and machine repair positions.

- Compiled a list of **572 tasks and responsibilities** in seven categories through on-site factory visits and meetings with Subject Matter Experts (SMEs).
- JTA addressed three forms of lithium-ion batteries – cylindrical, pouch and prismatic.
- Task lists were reviewed and verified as accurate by employer and union designated SMEs.



Designed Battery Cell Manufacturing Curriculum Outline (2023-24)

The BWI Team converted the verified task lists into 36-page curriculum outline.

- Curriculum outline for machine operator and machine repair positions includes module titles, estimated duration of training, learning objectives for classroom or online instruction.
- Modules provide a **holistic understanding of the advanced battery manufacturing process**, with a priority on health and safety procedures, as industry leaders requested.
- Curriculum outline was reviewed with participating companies and **verified as accurate** by their SMEs.



Developed Battery Machine Operator Curriculum (2024)

The BWI Team worked with an instructional design firm with more than 20 years of expertise in training for the transportation industry, including zero-emissions vehicles.

- The **Battery Innovation Center (BIC)** provided significant **SME support** to an instructional designer team in creation of the curriculum.
- BWI team of designers **prepared a curriculum** with modules, including introductory material, emphasizing safety considerations, and a module for each step in the complex production process for advanced Battery Machine Operators.
- Accuracy of **modules was verified** by a collaborative of SMEs from several companies, union training programs, and BIC experts.



Focus on Health and Safety

The BWI team worked with advanced battery manufacturing subject matter experts to review, refine, and boost the curriculum's safety and health content.

- Subject matter experts from United Auto Workers, NAATBatt, the Occupational Safety and Health Administration (OSHA), and the University of Michigan were included in this effort.



Certified National Guideline Standards - NGS (2024)

In addition to curriculum development, the BWI collaborated with the US Department of Labor and its Office of Apprenticeship.

- BWI and USDOL **jointly developed the National Guideline Standards (NGS)** for Battery Machine Operator (O*Net Code 51-4081.00) based on JTA verified by industry stakeholders and SMEs.
- The NGS framework is vital for future conversion into a **registered apprenticeship program**.
- The NGS for Battery Machine Operator is **now posted on the USDOL website - National Guideline Standards for Battery Machine Operator** - for widespread use.



Started Pilot Training Program - Round 1 (Spring – Fall 2024)

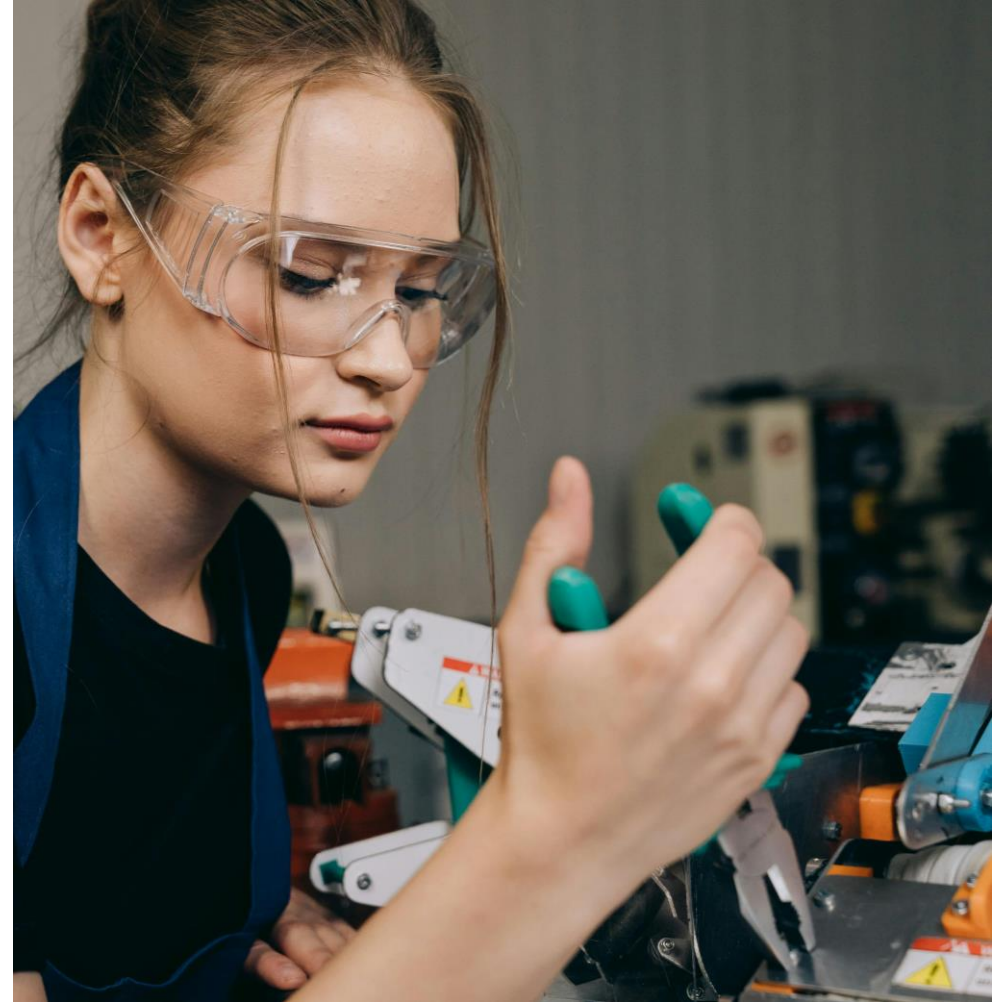
BWI selected and funded three companies as pilot project sites to test the curriculum and materials; the pilots started in September 2024.

- The BWI project is delivering **trainer orientation sessions** and will review the curriculum and instructional methods.
- **Three companies will implement** the training and participate in evaluating and improving its effectiveness in collaboration with the BWI Team.



Deliverables for late 2024-2025

- Pilot projects completed and results evaluated by BWI.
- Approach for second round of pilot projects to be developed and implemented for additional cell manufacturers.
- Industry-based, validated curriculum available widely, with a design and implementation methodology accessible to other clean energy technology producers in the supply chain and post-secondary education and training providers.
- Approved curriculum (with training materials) to be disseminated in a way that ensures the integrity of its components for community colleges and other providers to offer to employers



Deliverables for late 2024-2025

- Principles of job quality and access to career ladders will continue to guide implementation of the curriculum in employer facilities.
- Application of the same collaborative approach to customizing curriculum will be launched for the recycling sector of the supply chain.
- Promote material sharing with community colleges and industry focused on key geographies where facilities are built.
- Finalize NGS for advanced battery machine repair.
- Identify priority occupations and conduct JTA in recycling, materials processing, and component manufacturing to address upstream industry stakeholders.

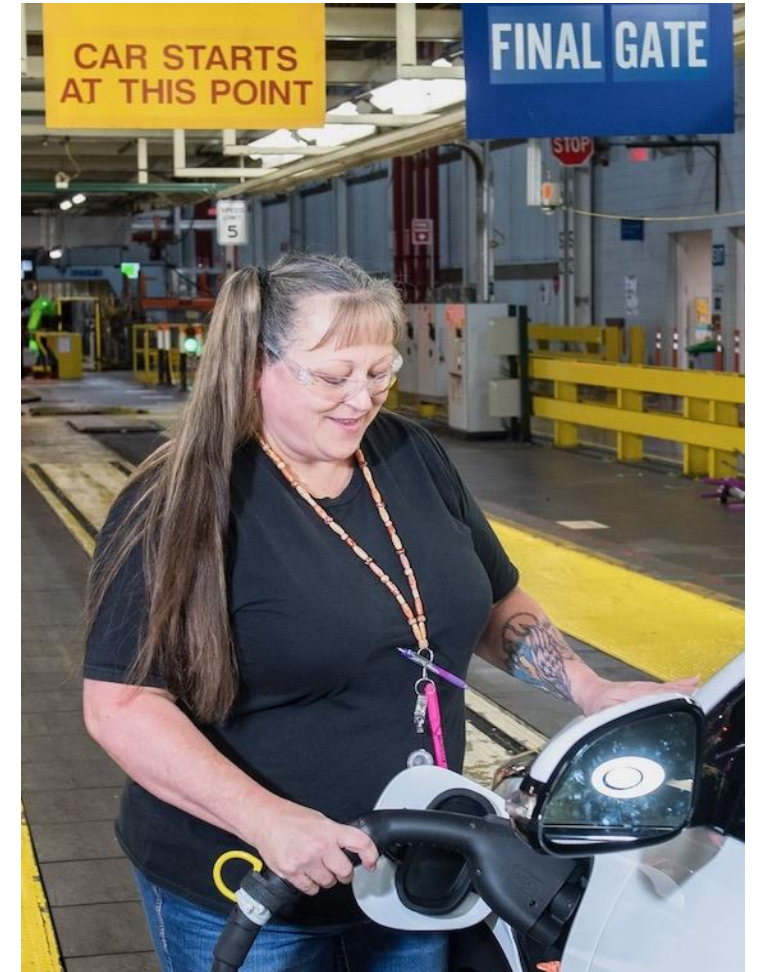
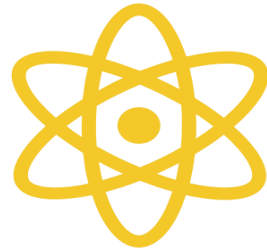


Photo Credit: The Washington Post

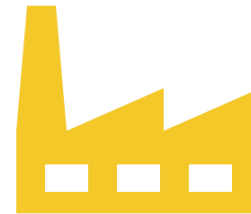
Lessons Learned



Engaging trusted industry and labor partners to tap their **subject matter expertise is critical for addressing training needs** that meet both workers and employers' needs.



Improvements in the manufacturing process and **efficiencies along with innovations in advanced battery chemistry will impact U.S. competitiveness** in the world market.

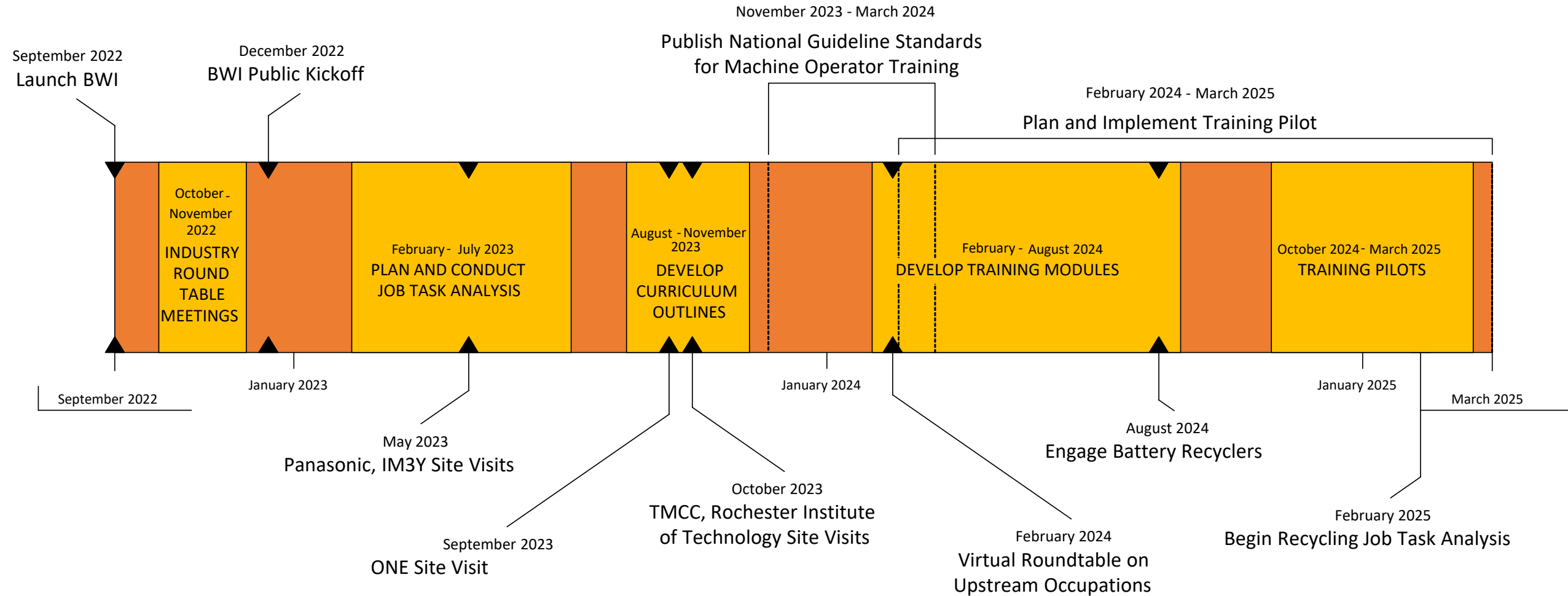


Job descriptions for many **occupations in advanced battery manufacturing and its supply chain are evolving.**



The government's convening power is unique and important to kickstart a national sectoral workforce strategy that aims to strengthen the advanced manufacturing workforce.

Historical Timeline of the BWI





Thank you

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