



The Battery Workforce Development Program

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Background

As the United States competes against potential great power adversaries and pursues a carbon-free infrastructure, the importance of energy storage technologies, or batteries, has gained traction. Batteries require a large volume of minerals, frequently rare earth, or strategic minerals, that must be extracted from sub-surface mines or repositories. There is a lack of expertise within the United States, which has been years in the making and extends throughout the battery value chain. Indeed, studies demonstrate a requirement for nearly 3-1/2 million U.S. manufacturing workers over the next decade, but skills gaps will result in over [2 million of those jobs going unfilled](#). This systemic deficiency in skills and knowledge range from mining to refining to the final application in the field and even through to the recycling of waste products of both production and end use. Each one of these gaps, as well as the aggregated deficiencies, has the potential to become a national security vulnerability.

The Battery Workforce Development program covers both new and continuing thrusts within NPS’ Energy Academic Group’s (EAG) ongoing efforts in research, outreach, curriculum development, and training programs within the broader DoD energy security field. This proposal also expands these efforts beyond NPS to support the continuation of ongoing energy related research and the delivery of professional, technical or vocational, and research-based, institutionally accredited instruction. The work will seek to identify areas where targeted teaching and degree programs, as well as just-in-time education and workforce development can further energy capabilities and capacities, as well as U.S. national interests.





Mission

The Battery Workforce Development team’s mission is to help train and educate individuals to better discover, mine, refine, deploy, and recycle strategic minerals and continue to instruct individuals in associated technologies to enact advanced battery solutions.

Phase I(a) Concept

Concurrent and complementary, but potentially duplicative efforts by other organizations, may be underway during the period of performance of this proposal. Therefore, the NPS team will **conduct a preliminary assessment of similar or redundant projects in the battery workforce development realm.**

For this reason, there will be a 3-month effort, designated Phase I(a), to determine the broader training and education landscape in this field. This assessment will include a breakdown of the battery sector into subordinate parts—specifically upstream, midstream, and downstream.

	Upstream	Midstream	Downstream
Government			
Industry			
Academia			

This sectoral analysis will be enhanced by, but not be limited to, efforts within the U.S. Government, notably the Departments of Defense, State, Energy, Interior, Commerce, and other relevant organizations.

Moreover, representatives from the battery industrial sector will be polled to determine the extent of workforce development programs. Finally, a review of academia will be made to determine whether similar efforts are already in existence at U.S. universities or trade schools. The combination of these summary assessments will provide the basis of the Phase I(a) final report. This document is an attempt to outline the Phase I(a) project scope, tasks and milestones; it is subject to refinement as the NPS/EAG team progresses in its research.

Process

To initiate Phase I(a), NPS/EAG will convene the first of three formal stakeholder meetings designed to introduce the actors and develop a structured course of action. Ad hoc or impromptu stakeholder meetings are expected during this 3-month period. It is anticipated there will be mid-term and concluding stakeholder meetings before the completion of the Phase I(a) activities.





Analyses of each sector (Government, industry and academia) will be conducted to determine status, scope and whether overlap exists. These sector analyses will provide the basis for the Phase I(a) final report, entitled **Summary of Ongoing Efforts and Activities**.

Additional, subordinate tasks embedded within Phase I(a) will be 1) a cursory sectoral gap analysis, 2) and the preliminary development of the consortium or Battery Workforce Advisory Group, which will be addressed in more detail in subsequent phases.

Additionally, the NPS/EAG team will engage with subject matter experts to address the status of government, industry and academic views on training/education. General topics will include:

Government:

- What are the nation's strategic goals regarding battery workforce development?
- What are the national security challenges?

Industry:

- From where do you expect to recruit workers and what is your plan for retention?
- Describe the top production and highly skilled occupations/fields your company expects to recruit.
- What type of job training partnerships has your company been involved in or is considering?
- How can an industry-guided skills project help your company meet its factory-level workforce development and training goals?
- Can you identify specific skills gaps in your workforce?
- Is there a comprehensive and accepted industry-wide list of required skills?

Education:

- From where do you expect to recruit students into relevant fields?
- From where do you expect to recruit faculty?

Phase I(a) Plan of Action and Milestones (POA&M)

A general POA&M is listed below, which begins with the project kickoff in early April 2023, through the conclusion in the first week of July.

1. Project kickoff: Week of 3 April 2023; project scope and outline
2. Initial stakeholder meeting: Week of 24 April 2023 (Virtual)
3. Mid-term stakeholder meeting: Week of 15 May 2023 (Hybrid)
4. Project IPR: Week of 22 May 2023
5. Concluding stakeholder meeting: Week of 12 June 2023 (Hybrid)
6. Draft report **Summary of Ongoing Efforts and Activities** completed: 23 June 2023
7. Final report **Summary of Ongoing Efforts and Activities** submitted: 7 July 2023
8. Sponsor comments and revisions: 28 July 2023





	2023	2024-25	2026-2027
PHASE I (including Phases I(a) & I(b))	April 2023 – April 2024		
MAJOR DELIVERABLE:	Phase I(a) Summary – Apr-Jul 2023		
<i>Strategic Roadmap</i> that will identify the key steps to achieving gap mitigation.		Phase I(b) – Aug 2023-Apr 2024 Completion of Strategic Roadmap – Mar 2024 Final Report and Outbrief – Apr 2024	
PHASE II		April 2024 – June 2027	
MAJOR DELIVERABLE:		STREAM #1: Academics Apr 2024-Jun 2025	
<i>Plan of Action and Milestones (POA&M)</i> leading to the systematic resolution and fulfillment of discovered gaps in battery and strategic mineral education and industry.		STREAM #2: Bridge Apr 2024-Mar 2026 STREAM #3: Industry Jan 2025-Jan 2027 Completion and Submission of POA&M Apr 2027	Completion and Submission of Lessons Learned – Jun 2027

Phase I(a) Deliverable

Phase I(a) will result in a **Summary of Ongoing Efforts and Activities**, delivered to the sponsor by 7 July 2023. This will include a broad sector assessment with a general path forward to inform Phase I(b).

In this Summary, we anticipate content broken down into three broad sectors; Government, industry and academia. Each sector will report on the existing workforce development efforts (if any) that can be identified.

Phase I(a) Budget

Item	Labor*	Travel	Other	Total
FTE 1	75,000	20,000		95,000
FTE 2	75,000	15,000		90,000
SME Labor	50,000			50,000
SME travel		35,000		35,000
Management Reserve			30,000	30,000
Total	200,000	70,000	30,000	300,000
*Based on an average loaded rate of \$300K				





The project will build upon and leverage ongoing activities in (though not limited to):

Department of Energy's Li Bridge Report
Federal Consortium on Advanced Batteries (FCAB)
Relevant initiatives from the Departments of Energy and Labor
Society of Automotive Engineers (SAE)
Curriculum development in coordination with the Advisory Group

Next steps

The results of the **Summary of Ongoing Efforts and Activities** will be leveraged to the benefit of Phase I(b) and the final roadmap. The roadmap is due in Mid-2024 and will effectively complete the Phase I task of the program. This phase will also shape the creation of the Battery Workforce Advisory Group, which be a guiding component of the program writ large.

Phase I(b) produces a strategic roadmap for a workforce development program. It identifies stakeholder groups, key targets and desired outcomes by stakeholder group, success metrics, and program timeline. A Battery Workforce Advisory Group is also created in this phase.

