

Battery Industry Workforce Education & Training Needs Assessment (BIETNA)



Li-Bridge Workforce &
Communities Committee

NAATBatt Education Committee



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RESEARCH

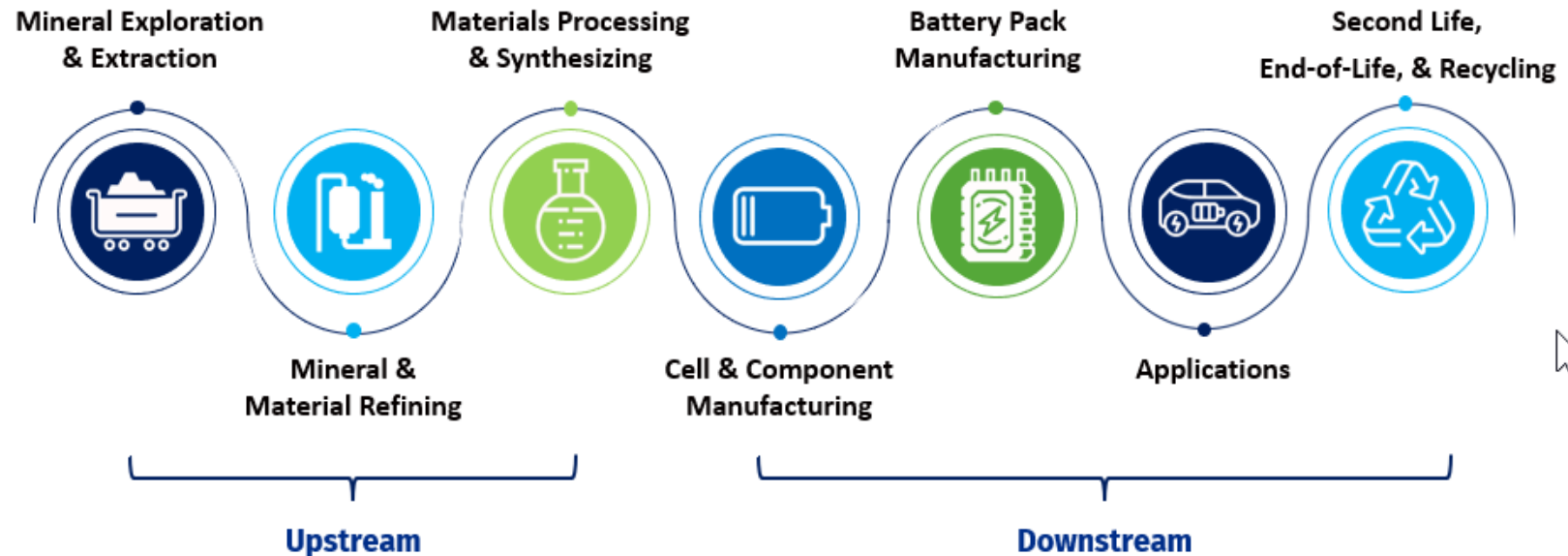
Mission and Assessment Objectives

MISSION

- The Li Bridge² objective: Strengthen and sustain the domestic lithium battery supply chain
- Meeting this objective requires building a U.S. skilled workforce scaled to industry demand
- **Phase 1:** Examine Workforce Skills Gaps³ within current battery industry, determine needs for training and education

ASSESSMENT OBJECTIVES

- Develop, execute comprehensive **assessment of skills gaps and workforce needs**
- Identify needs across the whole battery supply chain
- Capture representative sample from each sector



Scope and Key Metrics of Workforce Needs

SCOPE OF INDUSTRY ASSESSMENT

- Gather perspectives of industry employers within lithium battery industry **across the entire supply chain**
- 2023 assessment executed via online survey platform, contact with industry and public sector
- This phase 1 identifies needs of industry. (Does not catalog training and education resources – that's phase 2)

KEY METRICS OF WORKFORCE NEEDS



Results: Skills Gaps and Outdated Skills

A. Skills Gaps

INDUSTRY-WIDE GAPS

Electrochemistry / Battery Chemistry

Manufacturing

Battery management systems (BMS)

Product & system design

Safety

Battery Recycling

UPSTREAM GAPS

Chemistry/ Chem. Engineering,
Extraction / Mining,
Metallurgical/ Mineral Processing

DOWNSTREAM GAPS

Electrochemistry/ Battery Chemistry

Battery Materials

(Chem. Eng. & Materials science)

Battery Management (BMS)

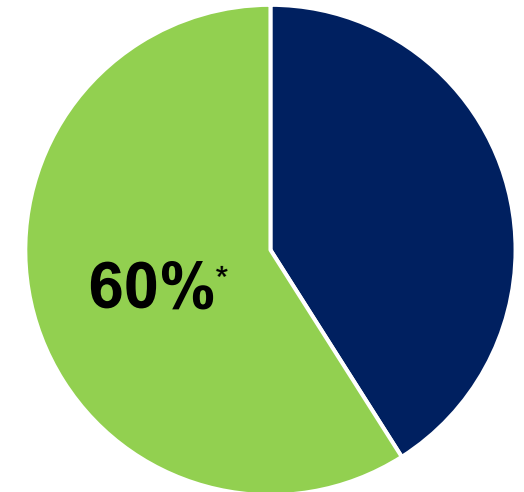
ADVANCED MANUFACTURING

Materials science,

Chemistry/
Electrochemistry,

Managing / operating
automated tools

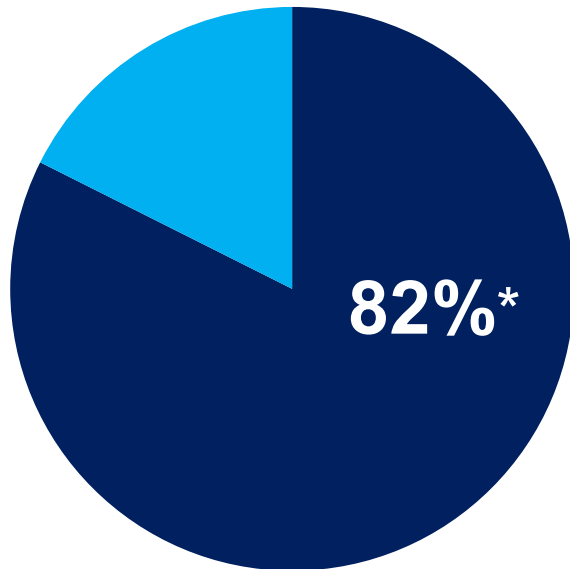
B. Outdated Skills



**Percent reporting 25-100% of employees with outdated skills*

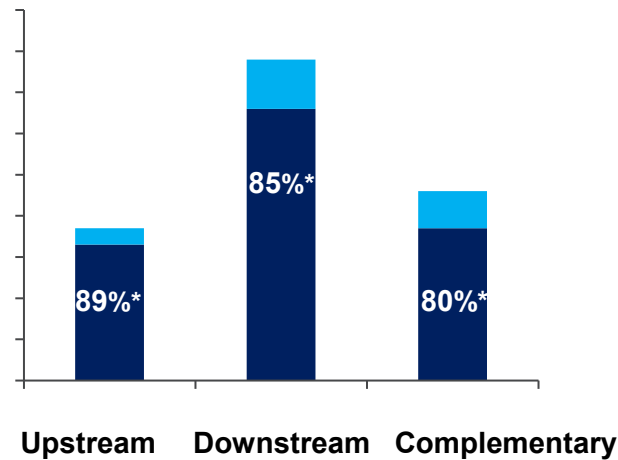
Findings: Workforce Shortages

A. SKILLED LABOR SHORTAGE



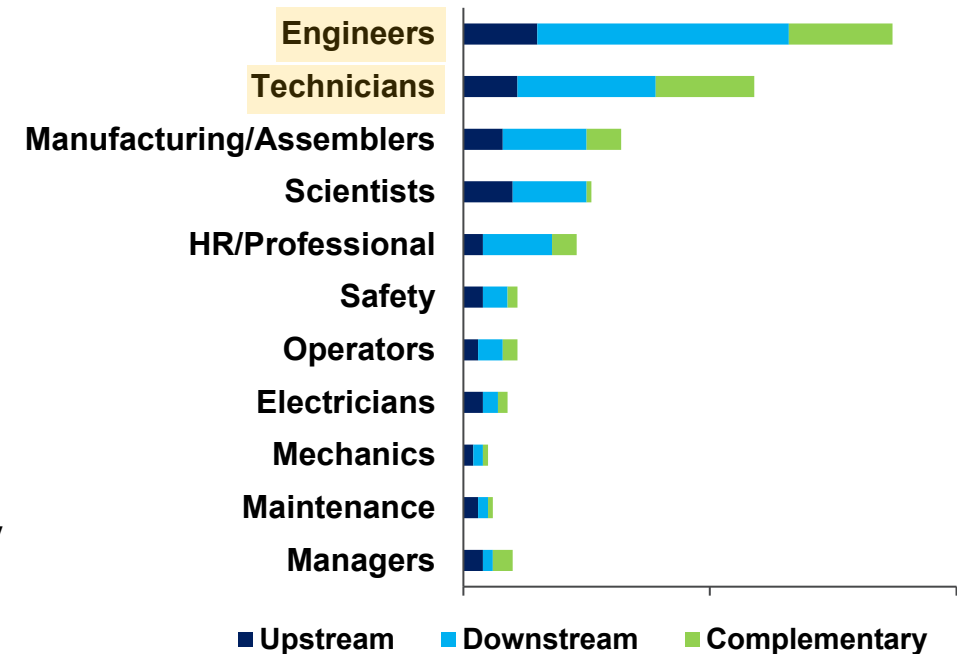
**Percent of employers reporting lack of skilled local labor*

B. LABOR SHORTAGE BY SECTOR



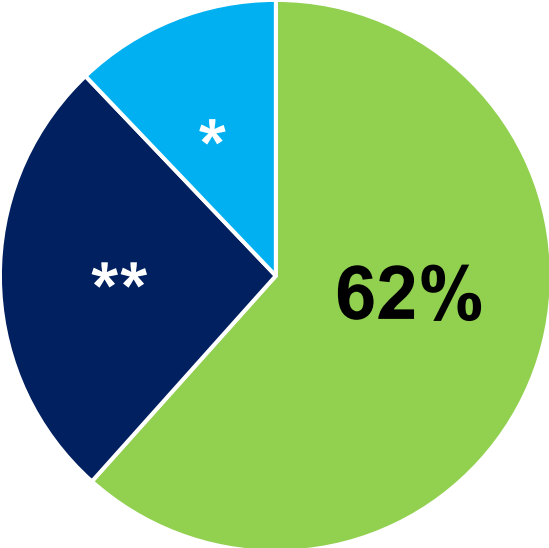
**Percent of employers reporting lack of skilled local labor*

C. ROLES IN SHORT SUPPLY



Findings: Recruitment & Retention Challenges

A. Recruitment Challenges for Technical/ R&D Roles



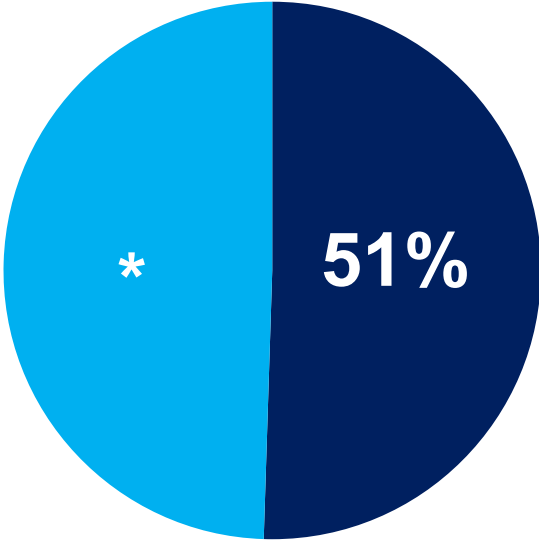
*26% report no challenges,
**12% challenges developing

B. Reasons for Retention Challenges

40% report challenges retaining skilled employees

- Competition with other industries
- Lack of veteran leaders and SMEs
- Geographic location/ cost of living
- Shift work
- Turnover due to high demand for battery engineers

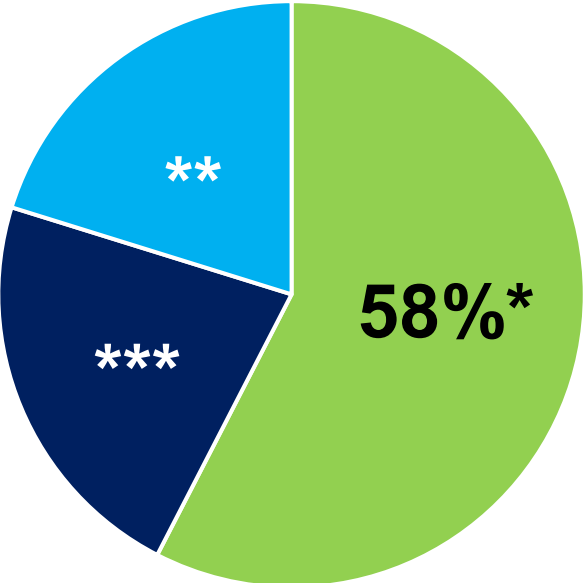
C. Recruitment Challenges: Relocation



*49% report no relocation challenges

Findings: Growth and Hiring Demand

A. Demand driving Industry Changes



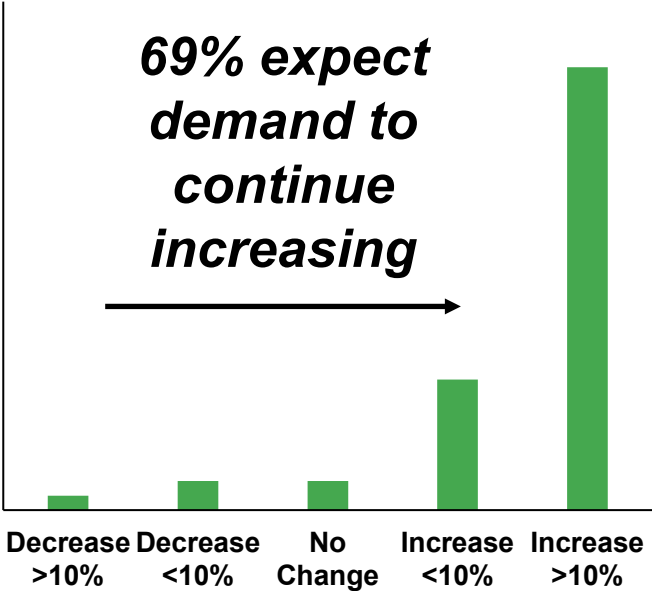
*Industry organizational changes expected (e.g., new departments, structure, or initiatives),
 ** Emerging changes, *** No Change

B. Hiring Demand Increases (2023-2026) by Area and Training level

UPSTREAM SECTORS
 Areas: Mineral exploration, Mining
 Training Source: On-the-job, Apprenticeship, 2-year degree

DOWNSTREAM SECTORS
 Areas: Components, Cell Mfg., Recycling
 Training Source: On-the-job, 4-year degree

C. Hiring Demand Following Scale-up (2026 - 2030)



Three Action Steps to Fill Workforce E&T Needs

The Assessment is Part 1 of a 3 Step Process to Address U.S. Advanced Battery Industry Workforce Education & Training (E&T) Needs Cost Effectively

1. **What We Need: Completed** - Battery Industry Education & Training Needs Assessment (BIETNA) ✓
2. **What E&T We Have: Pending** - Collect and catalog a comprehensive database of the U.S. and allied battery / battery-related E&T courses and programs – the Master Battery E&T Catalog
 - Incorporate it into a 1-stop online, central, searchable E&T service directory
 - Make it publicly / freely available and update it twice annually
3. **What E&T is Missing / Fill The Gaps: Pending** - Compare 1 & 2 to identify the gaps in U.S. workforce and allied battery and battery-related E&T
 - Encourage and catalyze E&T content providers to fill those gaps
 - Provide funders with the information needed to target those needs most cost effectively (and not fly blind)



Next: Build the Education & Training Master Catalog

Reach out to hundreds of battery training and education providers in the U.S. and allied nations - including trade and apprenticeship schools, community colleges and universities. Collect the disparate offerings and unify them for maximum access and efficient utilization by government, industry and the workforce

- A sizable team needed to convince hundreds of providers to participate
- Organize, sort, and tag courses and programs for battery E&T application.
Most E&T institutions do not label for battery E&T
- I.T. work to construct the website and build the database

Platform for ongoing public information service:

- Will enable workers to find and engage the battery E&T needed
- Ongoing 2x / year outreach to maintain currency
- Organize, sort, and tag for battery E&T application 2 x / year
- Daily operational work
- Regular maintenance of catalog, database, website



Access to the Battery Industry Workforce Edu. & Training Needs Assessment



Please review the BIETNA after the panel.