

STRIDE Ventures Tech Metal Transformation Challenge Solicitation / Call for Submission

CALL FOR SUBMISSION STRIDE VENTURES CHALLENGE: TECH METAL TRANSFORMATION

WHAT IS STRIDE VENTURES?

STRIDE Ventures exists to advance breakthrough innovation that reinforces U.S. technological leadership, economic security, and industrial resilience. By supporting the translation of high-potential research into deployable solutions, STRIDE Ventures initiatives aim to strengthen the nation's capacity to address critical challenges in manufacturing, energy, and materials. Through targeted funding, expert guidance, and strategic partnerships, STRIDE Ventures fosters the development of scalable technologies and new industrial capabilities that contribute to a more resilient, competitive, and secure U.S. innovation ecosystem.

WHAT IS THE TECH METAL TRANSFORMATION CHALLENGE ABOUT

The United States is home to vast, underutilized reserves of critical metals—embedded not in mines, but in our waste. From e-waste and batteries to industrial residues and post-use electronics, these materials represent a strategic opportunity to **rebuild domestic supply chains** and **fuel advanced manufacturing**.

The **Tech Metal Transformation Challenge** is a multi-year, milestone-driven program designed to support the development of **integrated systems** that can extract, convert, and deliver **manufacturing-grade materials** from complex waste streams. This challenge creates a **manufacturing innovation pipeline**, aimed at reshoring critical material capabilities and enabling the next generation of resilient, U.S.-based production.

We are seeking teams that can:

- Start with **early-stage prototypes (TRL 3)** and progress toward **production-ready systems (TRL 7)**,
- Deliver **functional metal outputs** that meet the performance, purity, and form factor requirements of U.S. industry,
- Integrate with **existing or emerging manufacturing workflows**, including additive, subtractive, or hybrid processes, and
- Scale efficiently to meet the throughput, cost, and reliability demands of industrial deployment.

We welcome **bold, interdisciplinary innovation** that combines mechanical, chemical, biological, and computational methods. Successful proposals will:

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- Demonstrate **system-level integration** across recovery, transformation, and delivery stages,
- Address **complex, mixed-material waste streams** (e.g., shredded electronics, printed circuit boards (PCBs), batteries),
- Avoid metal dissipation and maximize **resource efficiency**,
- Go beyond recovery to **create functional, industrially relevant materials**, and
- Articulate a clear path to **commercialization and manufacturing adoption**.

The program is structured in three stages:

- **Stage 1** (10 months): **Technical Validation** – Establish proof-of-concept for metal recovery and transformation from standardized reference materials.
- **Stage 2** (12 months): **Market Validation** – Demonstrate alignment with manufacturing needs, identify offtakers, and validate integration into supply chains.
- **Stage 3** (12 months): **Scale-Up** – Advance toward TRL 7 with pilot-scale systems and manufacturing partnerships to demo recovered materials in a manufacturing process.

THE GOAL

The goal of the Tech Metal Transformation program is to catalyze breakthrough technologies that redefine how the United States sources and manufactures with critical metals by transforming complex waste into high-performance materials through bold, unconventional approaches.

Over three stages teams will design and demonstrate **integrated, end-to-end systems** that can extract, convert, and deliver metals from domestic waste streams in forms suitable for direct industrial use. Starting from **early-stage prototypes (TRL 3)**, the program challenges teams to reach **production-ready functionality (TRL 7)** not by optimizing what exists, but by inventing what doesn't.

Of particular interest are solutions that can process **complex, difficult-to-separate metal mixtures** (e.g., e-waste, batteries, industrial residues) and convert them into **functional materials**—such as metal salts, high-entropy alloys, or nanoparticles—with a **clear path to reuse in existing or emerging manufacturing applications**.

Teams are expected to combine insights from **multiple scientific disciplines**, including chemistry, biology, materials science, mechanical engineering, and computer science to overcome current technical and economic barriers.

Through this challenge, **STRIDE Ventures** aims to secure **domestic access to critical metals**, reduce dependence on foreign supply chains, and position the United States as a **global leader in advanced material transformation**.

THE PROCESS

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The Tech Metal Transformation program is structured as a **multi-year, milestone-driven challenge** designed to accelerate the development of breakthrough systems from early-stage prototypes to production-ready solutions. The process is designed to be fast, focused, and flexible, supporting bold ideas while ensuring accountability and progress.

Application and Selection

Teams will submit a written application outlining their technical concept, interdisciplinary approach, and vision for manufacturing integration. A panel of experts will evaluate proposals based on their potential for disruptive innovation, feasibility, and alignment with the program's goals. Up to **eight teams** will be selected to participate in Stage 1.

Three Stages of Advancement

The challenge is divided into one 10-month and two 12-month stages, each supported by funding, 1:1 expert coaching matches, and group quarterly in-person mentoring days:

- **Stage 1: Technical Validation (10 months)**
Teams will demonstrate proof-of-concept systems capable of extracting and transforming metals from standardized reference waste streams. Emphasis is placed on technical feasibility, functional outputs, and early integration potential with manufacturing processes.
- **Stage 2: Market Validation (12 months)**
Selected Stage 1 teams will advance to demonstrate how their technologies can meet real-world manufacturing needs. This includes identifying offtakers, validating product-market fit, and refining system design for industrial relevance.
- **Stage 3: Scale-Up (12 months)**
Selected finalists from Stage 2 will build toward TRL 7, demonstrating pilot-scale systems with clear pathways to production. Teams will be expected to show readiness for deployment, including cost models, throughput targets, and integration into domestic supply chains.

Funding

Teams selected for Stage 1 of the Tech Metal Transformation Challenge will be eligible to receive up to \$2 Million in non-dilutive grant funding. The Stage 1 funding will be distributed along the following timeline:

- Up to 50% of total funding (\$1M) upfront, upon signing of the participant agreement.
- Up to 25% of total funding (\$500K) at the beginning of the 5th month (of 10) of Stage 1.
- Up to 25% of total funding (\$500K) at the beginning of the 7th month (of 10) of Stage 1.

If selected, teams will be eligible for \$2.5M for Stage 2 and \$3M for Stage 3 respectively. The timeline for these stages consists of 50% of total funding available for that stage upon selection and signing of updated agreements, followed by 25% of total funding at the beginning of the 6th month (of 12) and the remaining 25% of the total funding at the

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beginning of the 9th month (of 12).

Evaluation and Support

At the end of each stage, teams will be evaluated based on progress toward technical, manufacturing, and commercialization milestones. A jury of experts will determine which teams advance.

Table 1: Expected time schedule

Date	Event
11/17/2025	Call for submissions launched
01/15/2026	Application deadline (11:59PM PT)
02/04/2026	- Notification of selection for Pitch Day
02/11/2026	
02/19/2026	- Pitch Day and Jury decision on participating teams
02/20/2026	
02/23/2026	Communication of Jury decision to teams
03/01/2026	Start of Stage 1
12/31/2026	End of Stage 1 – Stage 2 Selection
01/01/2027	Start of Stage 2
12/01/2027	End of Stage 2 – Stage 3 Selection
01/01/2028	Start of Stage 3
12/01/2028	End of Challenge and Winner Announcement

Stage 1

In Stage 1, selected teams will lay the technical foundation for their breakthrough system. The goal is to move from concept to **proof-of-concept demonstration** showing that the proposed approach can extract and transform metals from complex waste streams into **functional materials** with clear potential for industrial use.

Each team will receive a **standardized reference material** composed of shredded **printed circuit boards (PCBs)** and **hard drives**. Teams may focus on multiple metals of their choice but must demonstrate a **selective, efficient, and scalable process** for recovering and converting metals from this input.

By the end of Stage 1, teams are expected to:

- Identify the **target metals or metal classes** they aim to recover and transform,
- Demonstrate a **proof-of-concept process** that produces at least one **functional material** (e.g., metal salt, alloy, nanoparticle) from the reference waste stream,
- Provide **quantitative evidence** of recovery efficiency, selectivity, and transformation performance,
- Show a **clear path to integration** with downstream manufacturing processes, and

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- Calculate a preliminary **TMT Critical Materials Score (CM-Score)**.

TMT Critical Materials Score (CM-Score)

A key evaluation measure for this challenge is the **Critical Materials Score (CM-Score)**, which indicates the extent to which the proposed process reduces the need for primary critical metals. To ensure comparability at the end of Stage 1, all teams must calculate their CM-Score using the following equation:

$$CM\ Score = \sum_i (R_i \times SR_i \times w_i)$$

Where:

Symbol	Description
R_i	Recycling yield of the critical metal (recovered mass ÷ original mass of material in reference)
SR_i	Recency-weighted mean Supply Risk score from the USGS Methodology and Technical Input for the 2021 Review and Revision of the U.S. Critical Minerals List
w_i	Weighting factor reflecting the square root of the metal's mass share in the starting materials, normalized so that all weighting factors sum to 1
$m_{i,content}$	Mass of the critical metal contained in the reference material, provided by NSF
$M_{reference}$	Total mass of the reference material, provided by NSF

The weighting factor is calculated as:

$$w_i = \frac{\sqrt{\frac{m_{i,content}}{M_{reference}}}}{\sum_j \sqrt{\frac{m_{j,content}}{M_{reference}}}}$$

If a critical metal does not have a recency-weighted mean supply risk score but appears on the [USGS List of Critical Materials](#) or the [DLA Materials of Interest List](#), teams should coordinate with NSF to determine an appropriate approximation.

Stage 2

In Stage 2, selected teams will advance their systems from technical feasibility toward market and manufacturing relevance. The focus is on demonstrating that the recovered and transformed materials are not only functional, but also valuable, usable, and desirable within real-world industrial contexts.

Teams must show that their approach can deliver materials that meet the performance, purity, and form factor requirements of specific manufacturing applications. This includes identifying target industries, potential customers or offtakers, and integration pathways into existing or emerging production environments.

By the end of Stage 2, teams are expected to:

- Validate that their recovered materials meet application-specific performance criteria (e.g., conductivity, mechanical strength, chemical compatibility),
- Demonstrate compatibility with downstream manufacturing processes, including any required pre-processing or conditioning steps,
- Identify and engage with potential offtakers, industrial partners, or supply chain stakeholders,
- Refine their system design for manufacturability, reliability, and cost-effectiveness,
- Update their TMT Critical Materials Score (CM-Score) based on improved recovery yields and expanded metal targets, and
- Present a preliminary commercialization strategy, including market sizing, value proposition, and regulatory considerations.

Teams that can show early traction with industrial partners, clear product-market fit, or evidence of scalable demand will be prioritized for advancement to Stage 3.

Stage 3

In Stage 3, finalist teams will transition from validated prototypes to **production-ready systems**. The focus is on demonstrating that the technology can operate at **pilot scale**, meet **industrial performance requirements**, and be deployed in real-world manufacturing environments.

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This stage is where bold ideas become tangible infrastructure. Teams must show that their systems are not only technically sound and market-aligned, but also **scalable, cost-effective, and ready for integration** into domestic supply chains.

By the end of Stage 3, teams are expected to:

- Advance their system to **Technology Readiness Level 7 (TRL 7)**, a prototype demonstrated in an operational environment,
- Prove that your system can operate under real-world conditions, processing complex waste and delivering transformed materials at a scale that signals readiness for industrial deployment,
- Provide **robust performance data** on recovery efficiency, material quality, energy and resource use, and system reliability,
- Demonstrate **integration with manufacturing partners**, including feedback loops for product specifications and process compatibility, and
- Finalize a **go-to-market strategy**, including cost models, supply chain partnerships, and regulatory readiness.

Teams that successfully complete Stage 3 will be positioned to lead the next generation of domestic critical materials manufacturing, delivering not just innovation, but impact.

APPLICATION & SELECTION

Who Can Apply

The Tech Metal Transformation Challenge is open to a wide range of U.S.-based applicants, including:

- Academic institutions and research organizations,
- For-profit companies of any size, including startups and established manufacturers,
- Nonprofit organizations and consortia,
- Multidisciplinary teams that combine expertise across science, engineering, and manufacturing.

The lead applicant must be a U.S.-based entity and will serve as the primary point of contact and contractual partner. The work must be primarily done in the U.S. International collaborators are welcome as team members, but funding will be awarded only to U.S.-based institutions.

Team Composition

There is no minimum or maximum team size. However, teams must demonstrate that they have or can assemble the full range of expertise needed to execute the proposed work. This includes technical, manufacturing, and commercialization capabilities.

Federally Funded Research and Development Centers (FFRDCs)

FFRDCs are subject to applicable direct competition limitations and cannot respond to this solicitation unless they submit a letter drafted and signed by their sponsoring organization that (a) cites the specific authority establishing their eligibility to propose to Government solicitations and compete with industry, and (b) certifies the FFRDC's compliance with the associated FFRDC sponsor agreement's terms and conditions. These conditions are a requirement for FFRDCs planning to be awardees or subawardees.

How to Apply

Applicants must submit a complete application package through the designated online portal by the deadline listed in the timeline. The application must include:

- A technical concept summary and system overview,
- A description of the proposed innovation and its differentiation from existing solutions,
- A work plan covering all three stages of the challenge,
- Team bios and organizational information,
- Budget estimates and resource contributions.

[APPLY HERE NOW](#)

Selection Process

All complete applications will be reviewed by experts with experience across science, engineering, manufacturing, and commercialization. This first round will assess the boldness, feasibility, and transformative potential of each proposal.

From this pool, a **subset of applicants will be invited to virtually pitch** to a **jury of interdisciplinary experts**. This is your opportunity to make the case for your vision: to show how your approach challenges the status quo, redefines what's possible, and could reshape how the U.S. manufactures with critical materials.

Participant Agreement

The Tech Metal Transformation Challenge is built to move quickly and keep administration light. To support this, the Participant Agreement will be shared shortly after the program launches, allowing applicants time to review the contract terms prior to Jury decisions. This will help ensure that funds can be released quickly once Stage 1 companies are selected. The Participant Agreement can be found at the following link: [STRIDE Ventures TMT Challenge Participant Agreement Link](#).