Competition Details

Critical Technologies and Minerals Resilience

Dates

Internal Submission Deadline:	Thursday, August 28, 2025

Details

Administrator(s):	Jerome Gately (Owner)
Category:	MIT Internal Funding
Cycle:	FY 2026
Number of Applications Allowed per Applicant:	Unlimited
Number of Possible Awardees:	Unlimited
Funding Source(s):	$100,000 - Unspecified
Workshop Documents:	We hosted the MIT Critical Technologies and Minerals Resilience Workshop in June 2025 to identify key themes where MIT expertise could support scaling efforts—email Liz Moore (eamoore@mit.edu) if you'd like access to the workshop materials
Main Contact:	Liz Moore - eamoore@mit.edu
Finance Contact:	Jerome Gately - jfgately@mit.edu
Head Faculty Member:	Elsa A. Olivetti - elsao@mit.edu

Description

More details in attached Critical Technologies and Minerals Resilience RFP document. See introduction below.

The United States and its international partners face significant energy and security risks due to a lack of comprehensive supply chain capacity for critical minerals. Building these capabilities involves significant challenges, given the small volumes of demand material, whose processing requires substantial capital expenditure with high operating costs.

In this Request for Proposals (RFP), the Office of the Vice President for Energy and Climate seeks innovative, creative, and translation-oriented ideas for building resilient critical minerals supply chains. This RFP will support early-stage efforts from MIT principal investigators (PIs) and their teams to develop transformative concepts that address barriers across the supply chain for critical energy and defense end uses.

This RFP provides short-term funding for MIT researchers to:
1.Identify novel solutions that are viable at scale, and
2.Develop the analysis, experiments, financial models, and/or external collaborations to attain preliminary results demonstrating the concept's feasibility.

The primary scope of the call is aimed at supporting the U.S.'s need for rare earths supplies. However, approaches for the extraction, processing, refining, and fabrication of other small-volume, essential elements will be considered, including rhenium, cobalt, and others. The overall goal of the RFP is to develop a portfolio of solutions that bolster MIT's strengths in critical minerals and better position MIT as a leader in this area as funding opportunities emerge.

Office of the Vice President for Energy and Climate

Critical Technologies and Minerals Resilience Request for Proposals (RFP) from MIT Principal Investigators

Issued:	Thursday, July 24, 2025
2-page proposal due:	Thursday, August 28, 2025
Funding announcement:	Week of September 8, 2025
Scope:	6-month grants with up to $100K in funding

Introduction

The United States and its international partners face significant energy and security risks due to a lack of comprehensive supply chain capacity for critical minerals. Building these capabilities involves significant challenges, given the small volumes of demand material, whose processing requires substantial capital expenditure with high operating costs.

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Scope

This RFP is focused on innovative and potentially transformational solutions to address barriers in the rare earths supply chain for critical technologies. Proposed projects can focus on any aspect of the supply chain, including extraction, processing, manufacturing, recycling, financing, social and environmental impact, and end uses. This proposal is for testing ideas to address key barrier(s) or validate mechanism(s) that could enable an identified solution to be realized in the next decade or sooner. Specific areas of interest are listed below; however, proposals are not

limited to these areas. This call is to support new high-risk, high-reward research through 6-month grants of up to $100K each.

This RFP provides short-term funding for MIT researchers to identify novel solutions that could prove viable at scale and develop the analysis, experiments, financial models, and/or external collaborations to attain preliminary results that demonstrate feasibility of these concepts. Submissions should clearly outline the key elements of the proposed concept that require demonstration or validation, identify critical mechanisms to be confirmed or revised, highlight barriers that must be overcome, and specify analyses that will generate actionable insights for decision makers.

Proposals should include:

1. A definition of the problem (see themes below);
2. A brief description of the proposed work and how it will fill a gap or gaps; and
3. A description of how the solution(s) have preliminary links to metrics, e.g., around cost per kilogram or component, number of process steps, degree of toxicity of solvents, or other metrics appropriate to the project scope.
    a. Additional metrics to consider include improvement in domestic output by X%, addressing regulatory issues by design, and comparisons to commercial state-of-the-art.
    b. While it is not expected that these metrics will be known quantitatively at the time of submission, the proposals should articulate the types of metrics that would be relevant to the problem statement and proposed approach.

Funded projects may involve the discovery of fundamental knowledge, but that knowledge should have a clear role in what potential solutions could achieve. Proposals that involve an integrated approach supporting the development of technological, workforce, financial, and other societal innovations are also of interest. Where relevant, proposals should also identify potential collaborators outside of MIT, either within industry or academia that the proposal team would engage for further support or based on initial results.

Themes

The following themes were identified at the MIT Critical Technologies and Minerals Resilience workshop in June 2025 as areas where MIT expertise could make significant contributions to plausible pathways to scale. If your proposal team is interested in receiving the workshop materials, please contact Liz Moore at eamoore@mit.edu.

Theme 1: **Sourcing feedstocks** from primary or secondary sources, particularly for heavy rare earth elements, but also including management of radioactive materials present in ore, developing integrated mining, recycling, and processing flow sheets for small-volume elements, and alternative geological mapping approaches using data-driven or *in situ* techniques.

Theme 2: **Refining and separation approaches** for primary and secondary feedstocks including modular approaches, development and use of alternative environmentally improved solvents, enhanced electrochemical process approaches, techniques to quantify and improve tradeoffs between metallothermic processes versus electrolysis or durability for electrolysis reactors.

Theme 3: **Process engineering, productivity, and controls**. Several of the techniques in the beneficiation and refining of these elements are mature and the challenge is on the engineering of the process. In this case, productivity can be enhanced through continuous extraction capabilities, better controls, or improved *in situ* property measurements.

Theme 4: **Metallization, alloying, and fabrication** approaches including materials efficiency, alternative manufacturing approaches (with a focus on permanent magnets but also including alloy production or additive approaches), including design for reuse, repair, and recyclability in product fabrication.

Theme 5: **Demand and substitution**: Alternative approaches to meet demand at the level of materials substitution (AI-driven development of alternative materials, addressing magnet chemistry diversity), performance tradeoff optimization, and systems substitution (replacement for permanent magnets).

Theme 6: **Alternative financing, policy, engagement strategy**, including stockpiling analyses, social engagement studies, strategies to overcome regulatory barriers by design (technological or otherwise) for practitioners along the supply chain, workforce training and others.

Merit criteria for proposed projects

Proposed projects will be assessed on, and must include descriptions and examples of, the following criteria:

1. **Strength of problem definition and approach:** This should consider the problem to be addressed; the proposed approach; and the feasibility of scaling the approach.
2. **Gap articulation**: What is transformational/innovative about the proposed approach relative to the current landscape, including existing players; current and past activities and why these haven't eliminated the barrier; and why the proposed approach is different.
3. **Team expertise**: Appropriateness of the team in tackling the problem. An understanding of how the team can leverage or influence partners for the greatest impact.
4. **External collaborator engagement: I**deas for partner and/or stakeholder engagement, co-development of activities, and/or next steps. This is a particularly important section for projects in the policy and community engagement space.

Proposal Submission

Proposals are due on Thursday, August 28, 2025, by 11:59pm ET.

Proposals consist of the following elements:

A. 3-page proposal narrative according to the inclusion list above and template provided.
B. Budget and budget justification (paragraph description, does not need formal routing).
C. Biographical sketches of named personnel and an explanation of their specific roles in the project.
D. Parts (a), (b), and (c) should be consolidated into a single pdf file. The following naming conventions for the file should be used:

LeadApplicantLastName_LeadApplicantFirstName_Proposal.pdf

With the following characteristics:

- Proposal text should be no longer than 3 pages, including all text, figures, tables and references (budget does not need to be within these two pages).
- No fonts smaller than 11-point should be used and margins no tighter than 1" on the sides, top, and bottom.
- Bio sketches of each named individual on the proposed project team are required and limited to one page per person. There is no limit on the number of named individuals.

Project Awards

It is anticipated that the seed awards based on this solicitation will be announced the week of September 8, 2025, and begin immediately thereafter.

Project Funding and Duration

Expected project duration is up to 6 months. Proposed budgets do not need to include indirect costs and do not need to be routed through RAS.

Project Progress and Reporting

Teams will be asked to provide a status update at 3 months and a final report at 6 months; a template will be provided when awards are made.