



DE-FOA-0002794: Request for Information on the Department of Energy's Critical Materials Research, Development, Demonstration, and Commercialization Application Program

DATE: August 9, 2022
SUBJECT: Request for Information (RFI)

Description

This is a Request for Information (RFI) issued by the U.S. Department of Energy's (DOE) on behalf of the Office of Fossil Energy and Carbon Management (FECM) and the Office of Energy Efficiency and Renewable Energy (EERE). This RFI seeks public input to help inform DOE's implementation of DOE's critical minerals and materials (CMM) research, development, and demonstration (RD&D) activities, including expanded activities funded by the Infrastructure Investment and Jobs Act, commonly known as the Bipartisan Infrastructure Law (BIL)¹ into an integrated Critical Materials Research, Development, Demonstration, and Commercialization Application (RDD&CA) Program. Specifically, the intent of this RFI is to obtain public input regarding the research priorities, managing mechanisms, and partnering opportunities for a Critical Materials RDD&CA Program, expanded by section 41003(c) and supported by section 41003(d) of the BIL² and authorized respectively by sections 7002(g) and 7002(h) of the Energy Act of 2020. Specifically, this RFI seeks input on:

- Critical Materials RDD&CA Program to integrate:
 - DOE annual appropriations for critical minerals and materials, including Fiscal Year (FY) 2022 directed appropriations³ and FY2023 requested appropriations⁴
 - BIL 41003(c): Critical Material Innovation, Efficiency, and Alternatives – Priorities & Implementation Strategy
 - BIL 41003(d): Critical Material Supply Chain Research Facility – Priorities & Implementation Strategy

¹ Infrastructure Investment and Jobs Act, also commonly known as the Bipartisan Infrastructure Law, Public Law 117-58 (Nov. 15, 2021) [hereinafter the Bipartisan Infrastructure Law or BIL].

² BIL, Title X – Authorization of Appropriations for Energy Act of 2020, section 41003 – <https://www.congress.gov/bill/117th-congress/house-bill/3684>.

³ Title III, Department of Energy. Division D, Energy and Water Development and Related Agencies Appropriations Act, 2022. <https://docs.house.gov/billsthisweek/20220307/BILLS-117RCP35-JES-DIVISION-D.pdf>

⁴ Volume 2, Crosscutting Activities. <https://www.energy.gov/cfo/articles/fy-2023-budget-justification>

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- Community Benefits: Job Quality and Equity including (a) community and labor engagement, (b) quality jobs, (c) diversity, equity, inclusion, and accessibility, and (d) Justice40 Initiative.⁵
 - Market Adoption, Scale up, and Industry/Sector Sustainability

Information collected from this RFI may be used by DOE for planning purposes, which could include developing future Critical Materials RDD&CA funding opportunity announcements. The information collected will not be published.

Background

For over a decade, DOE has funded critical minerals and materials (CMM) RD&D activities around a CMM strategy^{6,7} to:

- Diversify and expand the supply from a wide range of sources that are economically viable and minimize environmental impact, including the co-production⁸ of minerals and materials;
- Develop alternative materials, manufactured components, and technologies that minimize or eliminate the use of CMMs, while utilizing materials with assured supply;
- Increase material and manufacturing efficiency across the supply chain, including efficient use and processing, as well as extending the lifetime of materials; and
- Promote a circular economy to remanufacture, refurbish, repair, reuse, recycle, and downcycle materials and components, while incentivizing collection.

These CMM RD&D activities include fundamental research on materials science, separation science and geoscience; the Critical Materials Institute, a public-private consortium that features applied R&D; public-private partnerships such as the Carbon Ore, Rare Earth and Critical Minerals (CORE-CM) program; and pilots and demonstration projects to validate and transition technologies to address supply chain vulnerabilities.

⁵ The Justice40 Initiative establishes a goal that 40% of the overall benefits of certain federal investments flow to disadvantage communities. The Justice40 Interim Guidance defines benefits as direct and indirect investments (and program outcomes) that positively impact disadvantaged communities and provides examples (Page 4): <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>

⁶ U.S. Department of Energy, 2010 Critical Materials Strategy. <https://www.energy.gov/eere/amo/2010-critical-materials-strategy>

⁷ U.S. Department of Energy's Strategy to Support Domestic Critical Mineral and Material Supply Chains, 2021. https://www.energy.gov/sites/prod/files/2021/01/f82/DOE%20Critical%20Minerals%20and%20Materials%20Strategy_0.pdf

⁸ Co-production refers to cases where many materials are produced together, each bringing in similar revenues rather than one material accounting for an overwhelming majority of revenue.

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Section 7002(g)(1) of the Energy Act of 2020 directs DOE to establish a Critical Materials RDD&CA Program to:

- develop alternatives to critical materials that do not occur in significant abundance in the United States;
- promote the efficient production, use, and recycling of critical materials, with special consideration for domestic critical materials, throughout the supply chain;
- ensure the long-term, secure, and sustainable supply of critical materials; and
- prioritize work in areas that the private sector by itself is not likely to undertake due to financial or technical limitations.⁹

Section 7002(g)(4) of the Energy Act of 2020 directs DOE to carry out the following activities as part of the Critical Materials RDD&CA Program:

- Alternative materials and energy technologies;
- Material and process efficiency across the full supply chain;
- Diversify domestic sources, including waste streams;
- Collection and recovery from post-consumer, industrial, or other waste streams;
- Advanced extraction, production, separation, alloying, or processing that decrease energy consumption, environmental impact, and costs of those activities;
- Commercial markets, advanced storage methods, energy applications, and other beneficial use; and
- Advanced theoretical, computational, and experimental tools.¹⁰

Section 7002(g) of the Energy Act of 2020 further directs DOE to establish a Critical Materials Consortium to support the Critical Materials RDD&CA Program.¹¹

Title III of Division D of the Energy and Water Development and Related Agencies Appropriations Act of 2022 appropriates DOE \$167,000,000 for research development, demonstration, and commercialization application activities related to critical materials.¹² DOE's FY2023 Budget Request includes a total of \$400,700,000 for the Critical Minerals and Materials Crosscut that spans multiple offices.¹³

⁹ Consolidated Appropriations Act, 2021, Public Law 116-260 (Dec. 27, 2020), Div. Z, Title VII, section 7002(g)(1) [hereinafter Energy Act of 2020].

¹⁰ Energy Act of 2020, section 7002(g)(4).

¹¹ Energy Act of 2020, section 7002(g)(8).

¹² Title III, Department of Energy. Division D, Energy and Water Development and Related Agencies Appropriations Act, 2022, Joint Explanatory Statement. <https://docs.house.gov/billsthisweek/20220307/BILLS-117RCP35-JES-DIVISION-D.pdf>

¹³ Volume 2, Crosscutting Activities. <https://www.energy.gov/cfo/articles/fy-2023-budget-justification>

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Further, a portion of DOE’s critical minerals and materials RD&D activities is funded by the Bipartisan Infrastructure Law (BIL). The BIL is a once-in-a-generation investment in infrastructure that will modernize and upgrade American infrastructure to enhance U.S. competitiveness, drive the creation of good-paying union jobs, tackle the climate crisis, and ensure stronger access to economic, environmental, and benefits for disadvantaged communities. The BIL appropriates more than \$62 billion to the Department of Energy (DOE)¹⁴ to invest in American manufacturing and workers; expand access to energy efficiency and clean energy; deliver reliable, clean and affordable power to more Americans; and demonstrate and deploy the technologies of tomorrow through clean energy demonstrations.

As part of this effort, the BIL authorizes and appropriates \$600 million for the 4-year period encompassing fiscal years (FYs) 2022 through 2025 for critical materials recycling, innovation, efficiency, and alternatives.¹⁵ The specific provisions for the Critical Material RDD&CA Program are authorized in Section 7002(g) of the Energy Act of 2020.¹⁶

In support of the Critical Materials RDD&CA Program, the BIL also authorizes and appropriates \$75 million for the 2-year period encompassing FYs 2022 through 2023 for the development of a Critical Material Supply Chain Research Facility.¹⁷ The specific provisions for the Critical Material Supply Chain Research Facility are authorized in Section 7002(h) of the Energy Act of 2020.¹⁸ The provisions in the Energy Act of 2020 and BIL will expand DOE’s existing and planned RD&D activities in DOE’s Office of the Under Secretary for Science and Innovation into an integrated Critical Materials RDD&CA Program.

Critical materials are the building blocks of clean energy technologies needed for transition to a net-zero energy future. The Critical Materials RDD&CA Program will integrate, expand, and accelerate DOE’s strategy to build resilient, diverse, sustainable, and secure domestic supply chains that support the clean energy transition and decarbonize energy, industrial, manufacturing, and transportation sectors, while promoting safe, sustainable, economic, and environmentally just solutions to meet current and future needs. This will support the Biden

¹⁴ U.S. Department of Energy. November 2021. “DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver For American Workers, Families and Usher in the Clean Energy Future.” <https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0>

¹⁵ BIL, section 41003(c).

¹⁶ Energy Act of 2020, section 7002(g).

¹⁷ BIL, section 41003(d).

¹⁸ Energy Act of 2020, section 7002(h).

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Administration's goal to achieve a carbon-free electric grid by 2035 and a net zero emissions economy by 2050.¹⁹

In alignment with BIL sections 41003(c) and 41003(d), this FOA and any related activities will seek to encourage meaningful engagement and participation of labor unions and underserved communities and underrepresented groups, including consultation with Tribal Nations²⁰.

Consistent with Executive Order 14052, this FOA is designed to support the goal that 40% of the overall benefits of certain investments flow to disadvantaged communities in accordance with the Justice40 Initiative, and drive the creation of good-paying union jobs through a focus on high labor standards and the free and fair chance for workers to join a union.

To achieve the greatest impact for all Americans with this once-in-a-generation investment in infrastructure, it is critical that the BIL-funded projects not only contribute to the country's energy technology and climate goals, but also (1) supports community and worker engagement; (2) invests in America's workforce; (3) advances DOE's equity, environmental and energy justice priorities; and (4) support the goal that 40% of the overall benefits flow to disadvantaged communities to advance DOE's commitment to the Justice40 Initiative²¹.

DOE's Draft Strategy for integrated Critical Materials RDD&CA Program, including related BIL Implementation

The U.S. Department of Energy (DOE) assesses material criticality based on importance to a range of energy technologies and the potential for supply risk. To mitigate risk of supply chain disruption, DOE coordinates research, development, demonstration, and commercialization application around the following pillars:

1. **Diversify & Expand Supply:** Diversify and expand critical mineral and material supply from varying sources while minimizing waste and increasing techno-economic co-production²² of materials;
2. **Develop Substitutes:** Innovate alternative materials and/or manufacturing components;

¹⁹ FACT SHEET: President Biden sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>

²⁰ EO 13175 November 6, 2000 "Consultation and Coordination With Indian Tribal Governments", charges all executive departments and agencies with engaging in regular, meaningful, and robust consultation with Tribal officials in the development of Federal policies that have Tribal implications.

²¹ The Justice40 initiative, created by EO 14008, establishes a goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities. <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>

²² Co-production refers to cases where many materials are produced together, each bringing in similar revenues rather than one material accounting for an overwhelming majority of revenue.

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3. **Materials and Manufacturing Efficiency:** Use and process materials efficiently across the entire supply chain and life cycle;
 4. **Circular Economy:** Remanufacture, refurbish, repair, reuse, recycle, and repurpose;
 5. **Enabling Activities:** Cross-cutting functions, such as criticality assessments, education and workforce development, stockpiling, advanced theoretical, computational, and experimental tools, etc.

This requires a material-by-material approach as part of an all-of-government solution. Building on decades of investment in science capabilities across DOE’s 17 national laboratories, DOE’s Offices of Energy Efficiency and Renewable Energy, Fossil Energy and Carbon Management, and Science have made targeted investments that span basic science, to applied research and development, to pilot and demonstration projects across multiple critical material supply chains for energy technologies.²³

In June 2021, the White House published a report on “Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth” that included 100-day reviews on critical minerals and materials as well as large capacity batteries by the Department of Defense and Department of Energy, respectively.²⁴

In February 2022, DOE published “America’s Strategy to Secure the Supply Chain for a Robust Clean Energy Transition” — the first comprehensive U.S. government plan to build an Energy Sector Industrial Base.²⁵ In addition to the strategy report, DOE developed 13 deep-dive assessments on specific technologies and supply chains.

Both sets of reports highlighted vulnerabilities in critical material supply chains for the U.S. economy and national security, including energy technologies, and promoted research and development as part of broader government-wide approach to address such challenges.

Through DOE’s assessments and in alignment with U.S. government goals to achieve 100% clean electricity by 2035 and reduce carbon pollution from the transportation sector,²⁶ DOE has tentatively identified the following priority critical material supply chains for the Critical

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https://www.energy.gov/sites/prod/files/2021/01/f82/DOE%20Critical%20Minerals%20and%20Materials%20Strategy_0.pdf

²⁴ <https://www.whitehouse.gov/wp-content/uploads/2021/06/100-day-supply-chain-review-report.pdf>

²⁵ <https://www.energy.gov/policy/securing-americas-clean-energy-supply-chain>

²⁶ <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>

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Materials RDD&CA Program as part of a material-by-material approach. The critical materials for energy technologies identified are summarized below:

- Neodymium, praseodymium, and dysprosium for magnets that enable efficient electric machines, including wind generators, electric and fuel cell vehicle motors;
- Lithium, cobalt, class 1 nickel, graphite, and manganese for lithium-based batteries needed for energy storage;
- Platinum group metals for catalysts for catalytic converters, chemical and petroleum sector, fuel cells, and electrolyzers for green hydrogen production;
- Gallium for light emitting diodes (LEDs) and wide bandgap power electronics that enable high voltage power generation; and
- Germanium for microchips needed for sensors, data and control that enable smart manufacturing.

The Critical Materials RDD&CA Program will integrate and expand ongoing DOE activities. The Critical Materials RDD&CA Program will be coordinated with several other critical materials-related efforts in the BIL and will not duplicate those efforts.²⁷

Ongoing DOE activities include:

- DOE Critical Minerals and Materials Budget Crosscut in FY21,²⁸ FY22,²⁹ and FY23³⁰
- DOE Energy Storage Grand Challenge Budget Crosscut in FY21,³¹ FY22,³² and FY23³³

Critical materials-related BIL provisions include:

- 40314, which, in part, amended the Energy Policy Act of 2005 to add section 815 – Clean Hydrogen Manufacturing and Recycling, and section 816 – Clean Hydrogen Electrolysis Program
- 41001 – Energy Storage Demonstration Projects

²⁷ Energy Act of 2020, section 7002(g)(6).

²⁸ U.S. Department of Energy. FY 2021 Budget Justification. Volume 2, pg. 271
<https://www.energy.gov/sites/default/files/2020/03/f72/doe-fy2021-budget-volume-2.pdf>

²⁹ U.S. Department of Energy. FY 2022 Budget Justification. Volume 2, pg. 313
<https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-2-v3.pdf>

³⁰ U.S. Department of Energy. FY 2023 Budget Justification. Volume 2, pg. 23
<https://www.energy.gov/sites/default/files/2022-05/doe-fy2023-budget-volume-2-crosscutting.pdf>

³¹ U.S. Department of Energy. FY 2021 Budget Justification. Volume 2, pg. 277
<https://www.energy.gov/sites/default/files/2020/03/f72/doe-fy2021-budget-volume-2.pdf>

³² U.S. Department of Energy. FY 2022 Budget Justification. Volume 2, pg. 317
<https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-2-v3.pdf>

³³ U.S. Department of Energy. FY 2023 Budget Justification. Volume 2, pg. 30
<https://www.energy.gov/sites/default/files/2022-05/doe-fy2023-budget-volume-2-crosscutting.pdf>

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- 41003(b) – Rare Earth Mineral Security
- 41007 – Renewable Energy Projects
- 40205 – Rare Earth Elements Demonstration Facility [from acid mine drainage, mine waste, or other deleterious materials]
- 40207 – Battery Processing and Manufacturing
- 40208 – Electric Drive Vehicle Battery Recycling and Second-Life Applications Program

The envisioned research priorities of the Critical Materials RDD&CA Program across stages of research and the supply chain for each critical material and corresponding energy technology supply chain are summarized in the Tables I to IV below. These research priorities are informed by the expected focus of the complementary BIL provisions described above. Additionally, the research priorities are envisioned to be supported by enabling activities, such as, but not limited to, criticality assessments, process modelling, techno-economic analysis, life-cycle assessments, advanced theoretical, computational, and experimental tools, etc.

Table I. Envisioned priorities for neodymium and dysprosium for magnets at each stage of research and the supply chain, highlighted in green.

Research Stage / Supply Chain Stage	Basic Science	Applied R&D	Pilots	Demonstration	Commercialization Application
Mining					
Extraction					
Coproduction from Diverse Sources					
Separation					
Processing					
Manufacturing, including Substitutes					
Design for Reuse/Recycle					
Recycling					

Table II. Envisioned priorities for lithium, cobalt, class 1 nickel, graphite, and manganese for energy storage at each stage of research and the supply chain, highlighted in green.

Research Stage / Supply	Basic Science	Applied R&D	Pilots	Demonstration	Commercialization Application

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Chain Stage					
Mining					
Extraction					
Coproduction from Diverse Sources					
Processing					
Manufacturing, including Substitutes					
Design for Reuse/Recycle					
Recycling					

Table III. Envisioned priorities for platinum group metals for catalysts at each stage of research and the supply chain, highlighted in green.

Supply Chain Stage \ Research Stage	Basic Science	Applied R&D	Pilots	Demonstration	Commercialization Application
Mining					
Extraction					
Co-production from Diverse Sources					
Processing					
Manufacturing, including Substitutes					
Design for Reuse/Recycle					
Recycling					

Table IV. Envisioned priorities for gallium for LEDs and wide bandgap power electronics and germanium for microchips at each stage of research and the supply chain, highlighted in green.

Supply Chain Stage \ Research Stage	Basic Science	Applied R&D	Pilots	Demonstration	Commercialization Application
Mining					
Extraction					

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Co-production from Diverse Sources					
Processing					
Manufacturing, including Substitutes					
Design for Reuse/Recycle					
Recycling					

Purpose

The purpose of this RFI is to solicit feedback from industry, academia, research laboratories, government agencies, State and local coalitions, labor unions, Tribes,³⁴ community-based organizations (CBOs),³⁵ and other stakeholders on issues related to opportunities for a Critical Materials RDD&CA Program. DOE is specifically interested in information on research priorities, managing mechanisms, and partnering opportunities as described below. This is solely a request for information and not a FOA. DOE is not accepting applications for financial assistance at this time. Please be advised that responses to this RFI are subject to disclosure under the Freedom of Information Act (FOIA).

You may answer as few or as many of the questions below as you would like. Please use the bolded Category numbers and sub-numbers as headings in your response to the greatest extent possible and refer to the questions (C1.1a, C2.12, etc.) in the body of your responses. This helps save time both for the responder and the reviewers. Please be as specific as possible in all responses.

Specifically, DOE is requesting input on the following categories and questions:

Category 1: Critical Materials RDD&CA Program and BIL Provisions Requirements (please be as specific as possible)

1. How should Program applicants be asked to demonstrate potential for and, if selected, measure progress toward the Administration’s goals of producing clean energy products; supporting community and economic development; creating or retaining

³⁴ Including Tribal governments, American Indian and Alaskan Native communities, Tribal enterprises, Alaska Native Regional and village corporations.

³⁵ Community-Based Organizations (CBOs) are public or private not-for-profit resource hubs that provide specific services to the community or targeted population within the community.

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good-quality jobs, including efforts to attract, train, and retain a skilled workforce; providing specific benefits to underserved and disadvantaged communities; securing domestic clean energy supply chains; building the technologies of tomorrow; achieving the goals of the Justice40 Initiative; and transforming the economy by 2050 to achieve net-zero emissions goals?

2. What metrics can be used to measure success of the Critical Materials RRD&CA program?
3. How can the Critical Materials RDD&CA Program meaningfully incorporate stakeholder and community engagement; job quality and workforce development; diversity, equity, inclusion, and accessibility goals; and the Justice40 priorities while also promoting domestic industries?
4. What policies, infrastructure, or other considerations could be put in place to enable the BIL provision implementation to be more successful?
5. What are the ideal timing and desirable features, terms, and conditions of off-take agreements that would stimulate the private sector investment necessary to achieve BIL provision-related infrastructure and long-term sustainability?
6. What are the opportunities to reuse or recycle existing infrastructure (inclusive of facilities and materials)?
7. What approaches can applicants use to guarantee off-take commitments and matching of supply and demand?
8. How should special factors be considered when identifying and selecting applicants (e.g., economic considerations, policy considerations, labor-management partnerships, environmental and energy justice considerations, geology, workforce availability and skills, current industrial and other relevant infrastructure and storage available/repurposed/reused, industry partners, minority-serving institutions (MSIs), minority-owned businesses, regional specific resources, security of supply, climate risk, etc.)?
9. What other factors should be considered across all categories?

Category 1A: Critical Materials Research, Development, Demonstration, and Commercialization Application (RDD&CA) Program – Priorities

10. What are the most high-impact opportunity areas to diversify supply, develop substitutes, increase material and manufacturing efficiency, and drive reuse and recycle of critical materials for energy technologies described above in the next 5 years? Please describe which critical materials/energy technologies and type of research project

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should be targeted (e.g., research stage, supply chain stage, specific research opportunity) as well as what metrics should be used to determine success.

11. What facilities or broadly available capabilities are needed to evaluate, pilot or demonstrate technologies, processes, and materials on an industrially relevant scale? What is an industrially relevant scale for the critical materials/energy technologies described above, or for other critical materials/energy technologies? If possible, address these questions on a material-by-material basis.
12. What are the barriers to commercialization of technologies that have been demonstrated at an industrially relevant scale?
13. What other critical materials supply chains for energy technologies merit RDD&CA investment? Please describe the opportunity for impact, type of research needed, and what metrics should be used to determine success.
14. What quantitative impact could the Critical Materials RDD&CA Program have on domestic supply chains in 5 years? Please describe technological (e.g., energy efficiency), economic, regional, environmental (e.g., life-cycle benefits, greenhouse emissions), or other impacts.
15. What research areas or topics are sufficiently mature that they do not merit federal investment through the Critical Materials RDD&CA Program?
16. What funding opportunities or mechanisms are most appropriate to address high-impact opportunities?
17. What are the greatest opportunities for education and workforce development within the Critical Materials RDD&CA Program? What is the best way to ensure these opportunities are available to a diversity of job-seekers and incumbent workers?

Category 1B: Critical Materials Consortium – Implementation Strategy

18. What consortium model would be most effective to integrate RDD&CA activities across an expected diverse membership?
19. What should the membership look like in terms of stakeholder type, balance across stakeholders (e.g., industry, small businesses, national laboratories, academia, federal agencies, and communities), and cost of membership?
20. How can the consortium ensure that the interests and concerns of Tribal councils, community-based organizations, and other stakeholders (as described in Category 3) are both heard and integrated into the RDD&CA portfolio, including providing opportunities and benefits for these stakeholders?
21. What management structures would you recommend for maximizing scientific impact, accelerating technology development, and advancing the technology readiness level and

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- manufacturing readiness level? Is there a consortium model that optimizes overhead and indirect expense, while ensuring maximum scientific and technical impact?
22. What kinds of supporting technical capabilities (e.g., analysis, modeling, artificial intelligence and machine learning (AI/ML) capabilities) would be most beneficial to the Consortium?
23. What other factors should be considered?

Category 1C: Critical Material Supply Chain Research Facility – Implementation Strategy

24. What functions should the facility or facilities focus on to support and accelerate the Critical Materials RDD&CA Program (such as, but not limited to, processing modelling, analytical capabilities, test bed facilities, material traceability)? Please specify whether the facility or facilities should focus on a single critical materials group or have the flexibility to consider a broader suite of critical materials.
25. What are the associated resources needed to construct, operate, and staff the facility or facilities, including user fees if appropriate? Please specify National Environmental Policy Act (NEPA) experiences and potential impacts or concerns.³⁶
26. Who should be the target users for this facility or facilities?
27. What should the research facility NOT do— i.e., what should be done elsewhere or not at all?
28. What existing or planned facilities could be leveraged to support the Critical Materials RDD&CA Program? Are there opportunities to expand these facilities and what resources are needed to do so?
29. What other factors should be considered?

Category 2: Community Benefits

Job Quality: In keeping with the administration’s goals, and as an agency whose mission is to help strengthen our country’s energy prosperity, the Department of Energy strongly supports investments that expand good-paying union jobs, improve job quality through the adoption of strong labor standards, increase job access, strengthen local economies, and develop a diverse workforce for the work of building and maintaining the country’s energy infrastructure and growing domestic manufacturing. The Department intends to use the section 41003(c) and 41003(d) authorizations and the broader Critical Materials RDD&CA Program to support the creation of good-paying jobs with the free and fair chance to join a union, the incorporation of strong labor standards, and high-road workforce development, especially through registered

³⁶ See National Environmental Policy Act regulations 40 CFR 1500, 10 CFR 1021, www.energy.gov/nepa

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apprenticeship and quality pre-apprenticeship programs. Respondents to this RFI are encouraged to include information about how this program can best support these goals.

30. In what ways, if any, do you anticipate that sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program could impact the workforce? For example:
 - a. To what extent do you anticipate job creation, job loss, or changes in job quality?
 - b. To what extent do you anticipate the creation of construction jobs? Ongoing operations and maintenance jobs? Other jobs across the supply chain?
31. What activities and engagement (e.g., with minority serving institutions,³⁷ community-based organizations, registered apprenticeship programs, joint labor-management partnerships, women and minority-owned contractor capacity building, and community-based quality pre-apprenticeship programs) would make implementation of sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program successful and sustainable in terms of workforce development; worker recruitment; improved diversity, equity, inclusion, and accessibility across the workforce; and the creation of good-paying union jobs?
32. How should labor standards be incorporated in project planning stages to support the creation of high-quality, good-paying jobs?
33. What existing workforce education and training efforts (e.g., specific registered apprenticeship programs, labor management training programs, community college or technical school programs, etc.) are preparing workers for this industry? How can those efforts be best supported or augmented to ensure success of sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?
34. What tools should sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program utilize to meet the goals of providing opportunities for workers displaced from fossil industries and other industrial or resource-based industries in decline?

Community and Stakeholder Engagement

35. What information do communities, Tribal or State governments, or other stakeholders need to engage with the Department on sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?

³⁷ Minority Serving Institutions (MSIs), including Historically Black Colleges and Universities/Other Minority Institutions as educational entities recognized by the Office of Civil Rights (OCR), U.S. Department of Education, and identified on the OCR's Department of Education U.S. accredited postsecondary minorities' institution list. See <https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

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36. What benefits or opportunities could encourage local, State, and Tribal governments to more effectively engage with the Department on sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?
 37. How should the Department better engage local, State, and Tribal governments to establish reasonable expectations and plans concerning sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?
 38. What organizations, universities, or communities should the Department consider partnering with to develop sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?

Justice40 and Equity, Environmental, and Energy Justice Priorities

Equity, environmental, and energy justice principles and priorities will be central to the successful implementation of the BIL. Equity requires the consideration of existing barriers underserved and underrepresented individuals and communities face when accessing Federal resources. Environmental and energy justice principles include procedural justice, distributive justice, recognition justice, and restorative justice. For the purposes of this RFI, DOE has identified the following non-exhaustive list of policy priorities as examples to guide DOE's implementation of Justice40³⁸ in disadvantaged communities: (1) decrease energy burden;^{39,40,41} (2) decrease environmental exposure and burdens;⁴² (3) increase access to low-cost capital; (4) increase the clean energy jobs, job pipeline and job training for individuals;⁴³ (5) increase clean energy enterprise creation with minority-owned or disadvantaged business enterprises); (6) increase energy democracy, including community ownership and other economic benefits associated with the energy transition; (7) increase parity in clean energy technology access and adoption; and (8) increase energy resilience.

Equity:

Equity is ensuring that traditionally underserved populations, including Black, Latino, Indigenous and Native American people, Asian Americans and Pacific Islanders and other

³⁸ See Note 3.

³⁹ The Initiative for Energy Justice https://iejusa.org/glossary-and-appendix/#glossary_of_terms

⁴⁰ DOE's LEAD tool illustrates energy burden in U.S. <https://www.energy.gov/eere/slsc/maps/lead-tool>

⁴¹ Drehobl, A., Ross, L., and Ayala, R. 2020. How High are Household Energy Burdens? Washington, DC: ACEEE.

⁴² Tessum, C., et al., 2019. Inequity in consumption of goods and services adds to racial-ethnic disparities in air pollution exposure. Proceedings of the National Academy of Sciences.

⁴³ DOE's US Energy & Employment Jobs Report (USEER), <https://www.energy.gov/us-energy-employment-jobs-report-useer>; Department of Labor, Civilian Labor Force by Sex, <https://www.dol.gov/agencies/wb/data/facts-over-time/women-in-the-labor-force>

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persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural or remote areas; persons otherwise adversely affected by persistent poverty or inequality; and Historically Black Colleges and Universities (HBCUs), MSIs, and Tribal Colleges and Universities (TCUs), have access to Departmental programs and opportunities.

39. How can the Critical Materials RDD&CA Program ensure community-based stakeholders/organizations are engaged and included in the planning, decision-making, and implementation processes (e.g., including community-based organizations on the program/project/activity team)?
40. What barriers exist, if any, for deeper economic and other engagement with communities impacted by this program/ project/activity?
41. Please give input on how the Justice40 policy priorities can be achieved through implementation of sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program to support the goal that 40% of the overall benefits of projects will flow to disadvantaged communities and maximize implementation co-benefits.
42. Please clearly articulate, with concrete actions, how regional economic growth and its benefits could be shared with underserved populations.
43. What equity, energy and environmental justice concerns or priorities are most relevant for the Critical Materials RDD&CA Program? How have/can these concerns or priorities been/be addressed?
44. Some of the activities involved in CMM supply chains are known to create adverse environmental and health hazards, such as historic mining operations in the U.S. that resulted in legacy mine waste.⁴⁴ How are adverse impacts currently measured or monitored, and which materials/processes/components result in the largest environmental impact? What opportunities exist to minimize impacts?
45. Describe possible human health, environmental or ecological considerations, both positive and negative (e.g., are there any air quality impacts, sensitive ecosystems, National Environmental Policy Act-NEPA issues, environmental justice communities, other considerations) in connection with implementation of this provision.
46. How would Tribal communities or lands be impacted by this Critical Materials RDD&CA Program if projects were selected in said community?
47. What factors should be considered when identifying and selecting the location of the technology/project/activity (e.g., economic considerations, policy considerations,

⁴⁴ International Energy Agency (IEA), 2021, The Role of Critical Minerals in Clean Energy Transitions, IEA, <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions> (November 1, 2021)

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environmental and energy justice considerations, geology, workforce availability and skills, current industrial and other relevant infrastructure and storage available/repurposed/reused, industry partners, minority-serving institutions (MSIs), minority-owned businesses, regional specific resources, security of supply, climate risk, etc.)?

Category 3: Market Adoption, Scale up, and Industry/Sector Sustainability

48. What mechanisms (e.g., tax/other incentives, offtake structures, prizes, competitions, alternative ownership structures, contracts for difference, etc.) would be valuable to incentivize market-based supply and demand relevant to sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?
49. What role/actions can DOE take to support reliable supply and demand for potential producers and customers relevant to sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?
50. What can DOE provide/do that would be helpful to a project to facilitate its collaborations with potential financing partners?
51. How can DOE support the applicants in working together to increase competitiveness and scale?
52. Which regional and site-specific metrics should DOE track to estimate the impact related to sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?
53. Other than greenhouse gas emissions, what sustainability metrics should DOE include in evaluating sections 41003(c) and 41003(d) and/or the broader Critical Materials RDD&CA Program?

Category 4: Questions related to the new Build America, Buy America requirements

54. Does any of the potential work under sections 41003(c) and 41003(d) involve the construction, alteration, maintenance, or repair of any of the following:
 - a. Roads, highways, and bridges;
 - b. Public transportation;
 - c. Dams, ports, harbors, and other maritime facilities;
 - d. Intercity passenger and freight railroads;
 - e. Airports;
 - f. Water systems, including drinking water and wastewater systems;
 - g. Electrical transmission facilities and systems;
 - h. Utilities;

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- i. Broadband infrastructure; and
 - j. Buildings and real property.
55. If your answer to question 1 is yes, please identify any iron, steel, manufactured goods/products or construction materials which may be crucial to this work, and whether you would normally procure those items domestically or from a foreign source.
56. For any item you indicate that you would normally procure from a foreign source, please specify to the best of your ability what actions you would take to comply with this requirement, such as seeking a waiver from Buy America; the impact on your project; and whether you would be unable to procure these items domestically due to lack of availability or cost.

Disclaimer and Important Notes

This RFI is not a Funding Opportunity Announcement (FOA); therefore, DOE is not accepting applications at this time. DOE may issue a FOA in the future based on or related to the content and responses to this RFI; however, DOE may also elect not to issue a FOA. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if DOE chooses to issue a FOA regarding the subject matter. Final details, including the anticipated award size, quantity, and timing of DOE funded awards, will be subject to Congressional appropriations and direction.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development; this RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as information only. DOE will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. DOE will not provide reimbursement for costs incurred in responding to this RFI. Respondents are advised that DOE is under no obligation to acknowledge receipt of the information received or provide feedback to respondents with respect to any information submitted under this RFI. Responses to this RFI do not bind DOE to any further actions related to this topic.

Freedom of Information Act

Responses received under this RFI are subject to public disclosure under the Freedom of Information Act. Because information received in response to this RFI may be used to structure future programs and funding opportunity announcements and/or otherwise be made available to the public, **respondents are strongly advised to NOT include any information in their**

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responses that might be considered business sensitive (e.g., commercial or financial information that is privileged or confidential), trade secrets, proprietary, or otherwise confidential.

If an RFI response includes business sensitive, trade secrets, proprietary, or otherwise confidential information, it is furnished to the Federal Government (Government) in confidence with the understanding that the information shall be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. Without assuming any liability for inadvertent disclosure, DOE will seek to limit disclosure of such information to its employees and contractors or as otherwise authorized by law. This restriction does not limit the Government's right to use the information if it is obtained from another source.

If, however, a respondent chooses to submit business sensitive, proprietary, or otherwise confidential information, the respondent must provide two copies of the response. The first copy should be marked, "non-confidential" with the information believed to be confidential deleted. The second copy should be marked "confidential" and must clearly and conspicuously identify the business sensitive, proprietary, or otherwise confidential information. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under the Freedom of Information Act or otherwise. The U.S. Federal Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

If your response contains business sensitive, trade secrets, proprietary, or otherwise confidential information, you must include a cover sheet marked as follows identifying the specific pages containing business sensitive, proprietary, or otherwise confidential information:

Notice of Restriction on Disclosure and Use of Data: Pages [List Applicable Pages] of this response may contain business sensitive, trade secrets, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be used or disclosed only for the purposes described in this RFI [Enter RFI Number]. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

In addition, (1) the header and footer of every page that contains business sensitive, trade secrets, proprietary, or otherwise confidential information must be marked as follows:

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“Contains Business sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure” and (2) every line and paragraph containing such information must be clearly marked with double brackets or highlighting. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Evaluation and Administration by Federal and Non-Federal Personnel

Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 USC 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting their response, consent to DOE providing their response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given the access. Submissions may be reviewed by support contractors and private consultants.

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to CriticalMaterialsProgramRFI@ee.doe.gov no later than 5:00pm (ET) on September 9, 2022. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (.docx) or PDF attachment to the email, and no more than 10 pages in length, 12-point font, 1-inch margins. Only electronic responses will be accepted.

For ease of replying and to aid categorization of your responses, **please copy and paste the RFI questions, including the question numbering, and use them as a template for your response.** Respondents may answer as many or as few questions as they wish.

DOE will not respond to individual submissions or publish publicly a compendium of responses. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents are requested to provide the following information at the start of their response to this RFI:

- Company / institution name

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- Company / institution contact
 - Contact's address, phone number, and e-mail address.

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