U.S. Department of Energy

Office of Technology Transitions
and
Office of Clean Energy Demonstrations

Inflation Reduction Act
Technology Commercialization Fund

National Laboratory Call for Proposals

Collaborative Alignment for Critical Technology Industries

DE-LC-000L004

Fiscal Year 2024

The U.S. Department of Energy's (DOE's) Office of Technology Transitions (OTT)[1] in partnership with the Office of Clean Energy Demonstrations (OCED)[2] issues this National Laboratory Call for proposals (Lab call) as part of the Inflation Reduction Act (IRA) Technology Commercialization Fund (TCF)[3].

This Lab call is part of a larger DOE effort to identify technology pathways to reduce industrial emissions[4,5] and accelerate commercial liftoff of these technologies to ensure deep decarbonization across multiple industrial sectors.[6] Several DOE offices are supporting these goals and objectives. OTT and OCED have developed this lab call in collaboration with the Industrial Efficiency and Decarbonization

[1] https://www.energy.gov/technologytransitions/office-technology-transitions
[2] https://www.energy.gov/oced
[3] U.S. Department of Energy, 2024. "Inflation Reduction Act Technology Commercialization Fund." https://www.energy.gov/technologytransitions/inflation-reduction-act-technology-commercialization-fund
[4] U.S. Department of Energy, 2022. "Industrial Decarbonization Roadmap." https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap
[5] https://www.energy.gov/industrial-technologies/industrial-technologies
[6] U.S. Department of Energy, 2023. "Pathways to Commercial Liftoff: Industrial Decarbonization." https://liftoff.energy.gov/industrial-decarbonization/

Office[7] (IEDO) within the Office of Energy Efficiency and Renewable Energy[8] (EERE). This lab call is focused on adoption challenges preventing later stage commercialization, demonstration, and deployment of industrial decarbonization technologies. Potential complementary lab calls from IEDO may focus on the creation and/or expansion of national labs capabilities, centers of excellence, and other investments in the national labs to aid the advancement industrial efficiency and decarbonization technologies. A lab call for a Low-Carbon Cement and Concrete Center of Excellence was announced by IEDO on July 19th, 2024[9].

This call solicits proposals from across the DOE national laboratory complex to:

(1) Bring together stakeholders across certain industries to address challenges that result when people work on similar industrial decarbonization strategies in isolation, with a specific focus on challenges hindering technology adoption, commercialization, and deployment; and

(2) Work with organizations along the industry value chain (i.e., technology developers, feedstock suppliers, project developers, facility owners, financiers, product customers, and impacted communities) to facilitate market adoption, scale-up and replication, and building consensus around low-carbon products.

This Lab call is focused on industry alignment for industrial decarbonization technologies with a focus on the chemicals, cement and concrete, and metals industries.

[7] https://www.energy.gov/eere/iedo/industrial-efficiency-decarbonization-office
[8] https://www.energy.gov/eere/office-energy-efficiency-renewable-energy
[9] U.S Department of Energy, 2024. "U.S. Department of Energy Announces Plans To Create Low-Carbon Cement and Concrete Center of Excellence To Reduce Industrial Emissions." https://www.energy.gov/eere/iedo/articles/us-department-energy-announces-plans-create-low-carbon-cement-and-concrete

Executive Summary

This National Laboratory call for proposals is issued by the Office of Technology Transitions (OTT)[10] and the Office of Clean Energy Demonstrations (OCED)[11], in collaboration with the Industrial Efficiency and Decarbonization Office (IEDO)[12] and the Office of Manufacturing and Energy Supply Chains (MESC)[13], as part of the Inflation Reduction Act (IRA) Technology Commercialization Fund (TCF)[14].

Through DOE's Pathways to Commercial Liftoff reports[15] and Industrial Decarbonization Roadmap[16], DOE has identified opportunities and challenges for developing, demonstrating, commercializing, and deploying technologies to decarbonize the industrial sector. This lab call intends to address commercialization and adoption challenges that arise when many entities work on similar challenges and solutions in isolation, then attempt to scale up, replicate, and deploy these technologies. Examples of adoption challenges might include but are not limited to integrating components and subsystems from different entities; or stakeholders using different metrics to evaluate technology or product performance risk, or carbon intensity.

This Lab call is part of a larger collaborative effort led by several DOE offices to reduce industrial emissions. OTT and OCED have and will continue to work in close collaboration with IEDO. This lab call is specifically focused on commercialization, demonstration, and deployment challenges. The separate tentative IEDO Lab calls may focus on lab capabilities, centers of excellence, and other investments to position the labs to address research, development, & demonstration (RD&D) challenges for industrial efficiency and decarbonization. Proposals in response to this OTT/OCED lab call are expected to be focused on the later stage stakeholders and adoption challenges, as only those efforts would be funded out of this lab call.

DOE intends to establish three multi-lab collaborative efforts focused on Industrial Decarbonization, with one consortium selected in each of the following industries:

(1) **Chemicals and Refining**,

(2) **Concrete and Cement**, and

(3) **Metals (iron, steel, and aluminum)**.

DOE expects these three consortia to work in close collaboration with each other. While each consortium will have its own unique stakeholders and will address industry-specific challenges, DOE

[10] https://www.energy.gov/technologytransitions/office-technology-transitions
[11] https://www.energy.gov/oced/office-clean-energy-demonstrations
[12] https://www.energy.gov/eere/iedo/industrial-efficiency-decarbonization-office
[13] https://www.energy.gov/mesc/office-manufacturing-and-energy-supply-chains
[14] U.S. Department of Energy, 2024. "Inflation Reduction Act Technology Commercialization Fund." https://www.energy.gov/technologytransitions/inflation-reduction-act-technology-commercialization-fund
[15] U.S. Department of Energy, 2024. "Pathways to Commercial Liftoff." https://liftoff.energy.gov/.
[16] U.S. Department of Energy, 2022. "Industrial Decarbonization Roadmap." https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap.

anticipates many of the activities to be conducted across multiple industries and require close collaboration within different stakeholder groups. It is expected that these consortia will communicate as necessary with each other and convene to disseminate cross-cutting information and share knowledge from their efforts. The consortia from this lab call should also, as applicable, communicate with the existing consortia in Hydrogen and Long Duration Energy Storage from the 2023 Collaborative Alignment for Critical Technology Industries lab call[17]. Proposals should highlight the team's approach to collaboration with the other consortia, who will oversee facilitating that collaboration, how much effort will be devoted to cross-industry tasks, and how each consortium will avoid duplication of efforts and of outputs.

DOE expects multiple national laboratories with proven and extensive expertise and capabilities in each given industry to collaborate. Each collaborative lab effort will:

- Establish a working group consisting of stakeholders across the industry's respective value chain (e.g., for-profit entities, non-profit entities, technology developers, feedstock suppliers, project developers, facility owners and/or operators, product customers, local jurisdictions, and communities);
- Jointly lead this industry working group and ensure its sustained operations over time;
- Publish independent technical reports and analysis (e.g., on competing approaches) that build upon and leverage existing DOE reports; and
- Support industry efforts toward developing and adopting assessment tools, product performance specifications, and widely accepted best practices.

Outputs at the end of each collaborative lab effort should include:

- Approved recommendations of the working group for addressing identified challenges (these recommendations should build and expand on those identified in the Pathways to Commercial Liftoff reports), as well as implementation action plans for proposed solutions and progress to date.
- Applications, databases, and other relevant tools to support demonstration and commercialization of relevant technologies.
- An industry community of practice, which can endure beyond the duration of the project, and will serve as the industry-recognized entity to ensure execution of the agreed upon recommendations and implementation plans.

This lab call is structured into three topic areas:

[17] U.S. Department of Energy, 2023. "DOE Announces Over $15 Million Towards Two Projects to Support Industry Engagement and Alignment for Clean Energy Solutions." https://www.energy.gov/technologytransitions/articles/doe-announces-over-15-million-towards-two-projects-support-industry

- **Topic 1: Collaborative Alignment on Decarbonization of Chemicals & Refining Industry**

  This topic focuses on engaging relevant stakeholders on the commercialization hurdles around the decarbonization of chemicals production and refining and will include chemicals and processes outlined in the Decarbonizing Chemicals & Refining Pathways to Commercial Liftoff Report[18]. Supporting the development of carbon intensity evaluation frameworks for chemical products to support green procurement efforts is of particular interest. This project should support the convening and implementation of these efforts across chemical products.

- **Topic 2: Collaborative Alignment on Decarbonization of Concrete and Cement Industry**

  This effort will work with existing cement consortia and other relevant industry groups to promote the commercialization of cement products and processes that have moved past R&D and are ready for demonstration in real-world applications within a short timeframe (3 – 5 years). The focus of this effort will be facilitating procurement of these materials and supporting commercialization of related products.

- **Topic 3: Collaborative Alignment on Decarbonization of Metals Industry**

  This topic will support the commercialization and deployment of low-carbon products, process, and feedstocks for iron, steel, steel mill products, and aluminum products. Additionally, this topic will support efforts to harmonize domestic and international frameworks for carbon intensity.

DOE recognizes that demonstration and commercialization of a new technology requires overcoming both technical and non-technical adoption barriers. Funding from OTT and OCED, through IRA TCF, will address adoption risks that slow or prevent commercialization and deployment of new technologies.[19] These challenges can result in overall increased engineering and design costs (especially nonrecurring engineering and design-related costs) for technology developers and end users. Differing approaches to carbon measurement, reporting, and verification can also hinder offtake of low embodied carbon products. Identifying the best solutions to scale-up demonstration and deployment requires collaboration across the industry to assess the benefits, drawbacks, and tradeoffs associated with any given approach.

Between the three topic areas, DOE expects to make approximately $15 million in IRA funding available for this lab call. DOE expects that labs will contribute the cost-share statutorily required by TCF[20];

[18] U.S. Department of Energy, 2023. “Pathways to Commercial Liftoff: Decarbonizing Chemicals & Refining.” https://liftoff.energy.gov/industrial-decarbonization/chemicals-and-refining/
[19] U.S. Department of Energy, 2024 “Adoption Readiness Levels (ARL): A Complement to TRL.” https://www.energy.gov/technologytransitions/adoption-readiness-levels-arl-complement-trl
[20] U.S. Department of Energy, 2024. "Technology Commercialization Fund." https://www.energy.gov/technologytransitions/technology-commercialization-fund

however, applicants may request a waiver to reduce cost-share along with a reasonable justification for doing so. Proposals should clearly indicate the degree of cost-share the project expects to provide.

In addition to this lab call, an anticipated lab call may be issued by the Industrial Efficiency & Decarbonization Office (IEDO). The office primarily focuses on earlier-stage RDD&D efforts to accelerate the innovation and adoption of industrial efficiency and decarbonization technologies. IEDO's technical priorities include the crosscutting technical topics and industry sector-specific opportunities identified in the Industrial Decarbonization Roadmap[21]. As IEDO recognizes that industrial decarbonization technologies are expensive to both develop and deploy, the funding provided through the IEDO lab call, which will be issued in Fiscal Year 2025, intends to lower the barriers in the advancement of these technologies. IEDO announced a Low-Carbon Cement and Concrete Center of Excellence lab call as part of a White House Cement and Concrete Convening event on July 19, 2024[22].

[21] U.S. Department of Energy, 2022. "Industrial Decarbonization Roadmap." https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap.

[22] U.S Department of Energy, 2024. "U.S. Department of Energy Announces Plans To Create Low-Carbon Cement and Concrete Center of Excellence To Reduce Industrial Emissions." https://www.energy.gov/eere/iedo/articles/us-department-energy-announces-plans-create-low-carbon-cement-and-concrete

Timeline

KEY DATES	
Lab call release date	August 12, 2024
Informational webinar	September 4, 2024, 4:00 p.m. ET
PROPOSAL DEADLINE AND DECISION DATES	
Submission deadline for Applications (See Section II.A.ii.)	October 14, 2024, 3:00 p.m. ET
Application status notifications (estimated)	Q1 FY25
Expected date for selection notifications	Q1 FY25
Expected timeline for project negotiations and finalization	Q2 FY25

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Lab Call Modification History

Modifications will appear here.

I. Lab Call Description

A. Background and Context

DOE's Technology Commercialization Fund

The U.S. Department of Energy (DOE) Technology Commercialization Fund (TCF) was established by Congress through the Energy Policy Act of 2005 (EPAct05)[23] and reauthorized by the Energy Act of 2020 (EA 2020) to "promote promising energy technologies for commercial purposes."[24] In line with its mission to expand the public impact of the department's research, development, demonstration (RD&D), and commercial application portfolio to advance the economic, energy, and national security interests of the nation, the DOE Office of Technology Transitions (OTT) is charged with leading policy and programs related to technology commercialization.

The Infrastructure Investment and Jobs Act, more commonly known as the Bipartisan Infrastructure Law (BIL), and the Inflation Reduction Act of 2022 (IRA) are once-in-a-generation investments designed to modernize and upgrade American infrastructure to enhance U.S. competitiveness, drive the creation of good-paying union jobs, tackle the climate crisis, and ensure improved access to economic, environmental, and other benefits for disadvantaged communities. These laws direct DOE to invest in American manufacturing and workers; expand access to energy efficiency and clean energy; deliver reliable, clean, and affordable power to more Americans; create a market for low- and net-zero carbon industrial and building products; and demonstrate and deploy the technologies of tomorrow through transformative, clean energy demonstrations.

As part of and in addition to upgrading and modernizing infrastructure, DOE's BIL and IRA investments will support efforts to build a clean and equitable energy economy that achieve a zero-carbon electricity system by 2035 and to put the U.S. on a path to achieve net-zero emissions economy-wide by no later than 2050 to benefit all Americans.

As with base appropriations, 0.9% of the RD&D and commercial application funding appropriated through IRA is allocated to the TCF. Under IRA TCF, OTT pursues activities that broadly support the commercialization of promising industrial decarbonization technologies and advance the goals of the IRA.

The Office of Clean Energy Demonstrations

The Office of Clean Energy Demonstrations (OCED)[25] accelerates clean energy technologies from the lab to market and fills a critical innovation gap on the path to achieving our nation's climate goals of

[23] Energy Policy Act of 2005, Public Law 109–58, 109th Cong. (August 8, 2005), *Improved technology transfer of energy technologies*, 42 U.S. Code § 16391 (a).
[24] Consolidated Appropriations Act, 2021, Public Law 116–260, 116th Cong. (December 27, 2020), 134 Stat. 2597, Sec. 9003. https://www.congress.gov/116/plaws/publ260/PLAW-116publ260.pdf.
[25] https://www.energy.gov/oced/office-clean-energy-demonstrations

net zero emissions by 2050. OCED's mission is to deliver clean energy demonstration projects at scale in partnership with the private sector to accelerate deployment, market adoption, and the equitable transition to a decarbonized energy system.

Collaborative Alignment for Critical Technology Industries

DOE recognizes that commercialization of a new technology requires overcoming both technical and adoption barriers. As technology readiness progresses and the technical challenges have been de-risked by the DOE basic and applied offices, a specific focus is expected to be placed on adoption risks preventing commercialization and deployment of new technologies. Examples of relevant adoption risks include delivered cost, functional performance, ease of use, market size and market openness, downstream value chain, workforce, ability to be integrated in a large infrastructure project, material sourcing, environmental and safety elements, regulatory environment, policy environment, permitting and siting, and community perception[26].

This lab call will establish three lab-led industry stakeholder consortia that will collaboratively identify industry-wide adoption challenges and develop and begin to implement recommendations and best practices for their resolution. Nascent technologies often include a wide range of different entities working to develop solutions in isolation. This yields a range of approaches that can be vastly different and cause issues as these technologies converge into emerging industries. Examples of such issues include integrating components and subsystems from different entities into large-scale projects, or challenges arising from stakeholders using different metrics to evaluate technology or product performance, risk, or carbon intensity. Further examples for specific technologies can be found in DOE's Pathways to Commercial Liftoff reports.[27] These challenges can result in overall increased costs, often for nonrecurring engineering and design efforts, and can prevent procurement of new technologies and products. Identifying the best solutions to these issues requires collaboration across the industry to assess the benefits, drawbacks, and tradeoffs associated with any given approach.

DOE recognizes that commercialization of a new technology requires overcoming both technical and adoption barriers. As technology readiness progresses and the technical challenges have been de-risked by the DOE basic and applied offices, a specific focus is expected to be placed on adoption risks preventing commercialization and deployment of new technologies by industry stakeholders. Examples of relevant adoption risks include delivered cost, functional performance, ease of use, market size and market openness, downstream value chain, workforce, ability to be integrated in a large infrastructure project, material sourcing, environmental and safety elements, regulatory environment, policy environment, permitting and siting, and community perception[28].

[26] U.S. Department of Energy, 2024 "Adoption Readiness Levels (ARL): A Complement to TRL." https://www.energy.gov/technologytransitions/adoption-readiness-levels-arl-complement-trl
[27] U.S. Department of Energy, 2024. "Pathways to Commercial Liftoff." https://liftoff.energy.gov/.
[28] U.S. Department of Energy, 2024 "Adoption Readiness Levels (ARL): A Complement to TRL." https://www.energy.gov/technologytransitions/adoption-readiness-levels-arl-complement-trl

As part of its mission to address America's energy and environmental challenges, DOE supports RD&D and commercial application activities to promote promising energy technologies for commercial purposes. As both sources of RD&D funding and technical expertise, DOE and its national laboratories have significant knowledge of and engagement with many of the emerging industrial decarbonization and energy technologies. Drawing on previous analyses and engagement, activities resulting from this lab call will use the convening power of the DOE National Laboratories to bring together relevant stakeholders across industries to facilitate discussion around divergent practices, identify challenges best addressed within the context of this work, and work collaboratively over the period of performance to develop and begin to implement recommendations and best practices for resolving these challenges.

Applicants are expected to have a strong sense of the landscape of the industry for the topic area for which they are applying (see Section I.B.), including the significant stakeholders (e.g., for-profit entities, non-profit entities, technology developers, project developers, facility owners and/or operators, local jurisdictions, and communities), and familiarity with commercialization, demonstration, and deployment barriers. Project staff should have experience with business development and engagement with their specific industry. Funding will allow National Labs to convene stakeholders across the industry over a period of time to identify the appropriate challenges and barriers to address, work collaboratively to develop recommendations, and propose best practices and other consensus-driven solutions or paths forward for the selected challenges and barriers. The proposed solutions and other results will be made public to promote integration across and growth of the industry ecosystem, and labs will work with partners to promote implementation of results.

B. Topic Area Description

i. Application Considerations (All Topics)

DOE expects this cohort to define and detail aspects and processes using different emerging pre-competitive approaches and to identify areas of convergence, divergence, and potential alignment to support consensus among supply-side stakeholders (such as manufacturers and technology developers). This cohort is also expected to provide the technical evaluation needed to determine consistent performance specifications and to propose a consistent methodology for evaluating the carbon intensity of novel materials, develop draft standard operating procedures, etc. These efforts will support consensus among demand-side stakeholders such as procurers and end users. Based on existing capabilities and understanding of the R&D and industrial complex, DOE expects the National Lab(s) to submit a detailed plan for how different barriers related to aligning industry interests could be tackled and the relevant stakeholders that should be involved as part of this cohort (e.g., industry players, safety and environmental agencies, financiers, independent engineers, certification bodies, certification development organizations (CDOs), standard development organizations (SDOs), etc.). DOE expects this cohort to leverage and coordinate with existing efforts already established by DOE and other organizations (related programs, organizations, and efforts can be found in Appendix B). This lab call should not result in a working group that is redundant to existing efforts; it should

coordinate with and amplify those existing efforts with a specific focus on accelerating market adoption, private sector lift-off, rapid deployment, and mobilization toward proposed solutions.

DOE envisions selecting one project per topic, each led by a team consisting of multiple national labs. It is anticipated that:

- Selected projects will collaborate with established cohorts of industry stakeholders (including members already engaged in similar DOE-funded activities to avoid duplication of efforts) and host regular convenings of the cohort over a set timeframe.
- The Project Director (PD) must have proven experience in industry engagement and outreach. Subject matter expertise relevant to the industry of the selected topic area and business development experience is preferred.
- The consortium will be structured into smaller groups focused on specific challenges, strategies, and recommendations. It is critical that the structure of the consortium and of the groups within it be nimble and agile, to be able to adapt and respond to evolving needs.
- The consortium will develop a series of action-oriented recommendations (practice, design, path forward) for the industry, with acknowledgement and, ideally, consensus of the entire cohort. Recommendations could take the form of reports, technical papers, or any other format that can ensure easy dissemination among the industry. However, creating elaborate final reports should not be a major focus of the projects; efforts should focus on dissemination and implementation of recommendations.
- Labs will widely distribute recommendations and collaborate with stakeholders on implementation in the final phase of the project, including development of applications, databases, and related tools to support commercialization of industrial decarbonization technologies as is applicable.
- A clear plan and path to engage with the other Lab call consortia on cross-cutting effort. These projects will need to have significant alignment between their activities and outputs, and it is the responsibility of all project PDs to regularly communicate their projects progress and findings to each other. Additionally, it is expected that each project will host a minimum of one convening of the full Lab call consortia cohort including the other projects selected from this lab call, during their period of performance.

Outputs at the end of the period of performance should include:

- A landscape analysis including review of past projects and discussions with end-users, installers, OEMs, and other stakeholders to better identify and outline commercialization barriers. This analysis should be completed early in the project to inform the long-term development of the effort. The analysis should also include an evaluation of existing analytical tools (e.g.,

technoeconomic analysis, life cycle analysis, measurement reporting and verification tools) available to industrial users.

- Using the above landscape analysis/evaluation of existing analytical tools, develop an executable yet adaptable plan for how national laboratories and industry will support the uptake of those tools or create additional tools.
    - Example tools to be identified and road mapped may include but are not limited to:
        - Carbon accounting for industrial decarbonization framework – Overarching framework, developed in collaboration with existing framework projects in DOE[29], to unify carbon accounting between industrial decarbonization applications.
        - Thermal systems management software – Systems for modeling (and thereby optimizing) heat flow process to improve energy efficiency and reduce GHG emissions. Thermal Systems software – Systems for optimizing heating process to improve energy efficiency and reduce GHG emissions.
- A publicly accessible database of active and recently completed industrial decarbonization projects for providing information about potential installers, OEMs, and other related expertise in related technologies to end users considering adopting these technologies.
- Working group recommendations for addressing specific commercialization and adoption barriers and implementation strategies for proposed solutions. Potential solutions may include but are not limited to:
    - Power decarbonization guide – A high level overview of options for implementing systems and processes to improve plant energy efficiency.
    - Community Benefits guide – Best practices for gaining community support for ID projects and considerations/recommendations when implementing new equipment to minimize potential impacts to communities.
    - Workforce guide – Evaluation of workforce development needs for integration of new electrified equipment, emissions monitoring requirements, and other related topic areas
    - Standardized designs/use cases repository – Development of universal designs to help with productization/replicability, reduce non-recurring engineering costs.

[29] U.S. Department of Energy, 2023. "DOE Selects Four National Laboratory-led Teams to Accelerate Commercialization of Carbon Dioxide Removal Technologies with $15 Million in Funding." https://www.energy.gov/technologytransitions/articles/doe-selects-four-national-laboratory-led-teams-accelerate

- ID Project Development guide – Playbook for industry stakeholders to help understand value proposition and streamline project development steps.
- Process heating guide - Workbook for industry stakeholders to evaluate potential efficiency improvements or decarbonization of their process heat.

- Working group recommendations for identified components that require development to enable technology adoption. These components should be limited to specific items that have created bottlenecks based on their current performance and should not be novel materials or equipment in an early TRL or ARL stage.

  Proposals must be broken into at least one budget period per fiscal year, with a logical go/no-go decision point between the budget periods. DOE expects projects to include efforts related to: finalization of the cohort of topic stakeholders; working with the cohort to determine a specific set of challenges and barriers to collaboratively address; establishing a mechanism for regular convenings of the cohort; establishing work plans for each of the specified challenge areas; carrying out work plans to address specified challenges; regularly convening the cohort; documenting and sharing any potential resolutions, recommendations, or paths forward; performing outreach to grow the consortia with new stakeholders; and working with stakeholders to incentivize and promote implementation of recommendations.

  Successful proposals will clearly explain their goals, plans, and resources in the following areas (non-exhaustive):

  - Proposals should clearly articulate the labs' position within the entire ecosystem of the topic for which they are applying, including technical expertise, degree of thought leadership, history of partnerships, and relevant outreach and engagement in this area. Applicants should be familiar with the commercialization barriers of their specific industry and DOE reports such as the Pathways to Commercial Liftoff reports[30] and the Industrial Decarbonization Roadmap[31].
  - Proposals should describe specific industry-wide or broad barriers and challenges they recommend proposing that their cohort consider addressing, including how this supports the commercialization goals of the project. This should consider, but is not limited to, the area of interest outlined in each topic.
  - Applications should clearly articulate progress toward assembling the cohort with which they will complete this project. All partners need not be finalized but should be identified and engaged.

[30] U.S. Department of Energy, 2023. "Pathways to Commercial Liftoff." https://liftoff.energy.gov/.
[31] U.S. Department of Energy, 2024. "Industrial Decarbonization Roadmap." https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap

- Proposals should identify and highlight team experience in activities outside of technical work which are critical to the successful organization of the project, such as coalition-building, business development, and project management
- Proposals should describe proposed cost-share. Please see Section II.A and Appendix A for specific cost-share information.[32]
- Proposals should describe an effective mechanism and engagement plan for working with, maintaining, and expanding their cohort throughout the project period.
- Proposals should consider cost- and effort-effective means for documenting the project, its outcomes and outputs, and any determinations made by its cohort, as well as how to make publicly available and publicize findings, lessons learned, recommendations, and other resources created by the consortia.
- Proposals should consider how to ensure that the proposed solutions generated by the working group are actionable by the industry and how to support their implementation, as well as the long-term sustainability of implementation plans.
- Applicants should consider long-term sustainability of the cohort, in the absence of continued funding or DOE oversight.

Proposals that fall outside the parameters specified in this section will be deemed nonresponsive and will not be reviewed or considered. All proposals must include how the team will track and show their respective impact and outcomes from the proposed project. Please refer to Section II.A.ii., Impact Tracking, to ensure these metrics and tracking requirements are built into any proposals.

ii. Topic 1: Collaborative Alignment on Decarbonization of the Chemicals & Refining Industry

The Pathways to Commercial Liftoff: Chemicals & Refining report lists several barriers to decarbonizing the chemicals industry. Challenges include operational challenges for facility retrofits and upgrades, challenges with consensus between stakeholders on emissions intensity, unattractive economics, low technology readiness, capital formation challenges, nascent ecosystem of value chain partners, lack of enabling infrastructure and challenges with permitting, and social/community acceptance[33].

The chemicals industry is a critical facet of industrial decarbonization due to its relative emissions impact, energy intensity, and connections to other industries. Creating universally accepted frameworks around quantification of chemical product intensity can help organizations interested in procuring low carbon products. Developing best practices for

[32] Please see Section II.A and Appendix A for more information about cost-share. The cost-share contribution requirement cannot be eliminated for demonstration and commercial application activities.

[33] U.S. Department of Energy, 2023. "Pathways to Commercial Liftoff: Decarbonizing Chemicals & Refining pg. 53.

integrating industrial decarbonization technologies and low carbon feedstocks can ease industry adoption. The Federal government can play a key role by convening stakeholders across the chemical industry and coordinating with CDOs and SDOs to support development of consensus-driven practices, procedures, and harmonized frameworks for equipment, processes, and products.

As part of the Collaborative Alignment for Critical Technology Industries lab call, DOE expects multiple national laboratories with proven and extensive expertise and capabilities in the chemicals and refining industry to partner to establish a working group consisting of stakeholders across the chemicals and refining value chain. The national labs will lead this industry working group and ensure its sustained operations over time, leveraging the convening power of the Federal government to bring different stakeholders together, publish independent technical reports and analysis (e.g., on competing approaches), and supporting industry efforts toward developing assessment tools, product performance guidelines, and common processes in coordination with CDOs and SDOs.

Based on existing studies and reports, as well as the input of external stakeholders, DOE has identified potential areas of interest for working groups of chemicals stakeholders to consider. This list is not meant to be prescriptive nor exhaustive. DOE expects applicants to refine the priority areas and work streams based on their knowledge and expertise of the industry. DOE does not expect RD&D or technology development work to be part of this effort; it is focused on accelerating commercialization and addressing barriers to deployment of existing technology. Areas of interest include:

- Consensus around measurement, reporting and verification of carbon intensity in novel low carbon chemical products.
    - Support the development of consensus-driven framework(s) for embodied carbon in collaboration with existing DOE and other Federal agency efforts.
    - Investigate opportunities to align emission intensity measurement best practices with international protocols.
    - Establish common specifications and parameters to enable easier procurement of low carbon products.
- Low-Carbon Fuels, Feedstocks, and Energy Sources (LCFFES)
    - Create technoeconomic analyses of different LCFFES scenarios to support quantification of cost to adopt different types of LCFFES.
    - Develop best practices for adopting LCFFES into existing production along with identification of potential risks associated with specific LCFFES technologies.
- Infrastructure build-out facilitation

- Evaluate potential for shared build-out of infrastructure for carbon capture and storage, and hydrogen between suppliers, customers, municipalities, and related stakeholders.

- Demand-side support for procurement of chemical products.
  - Work with procurers of chemical products to articulate benefits of decarbonized goods and evaluate procurement hurdles to support demand for low carbon products.

Application materials should specify which areas of the chemicals and refining industry and industrial decarbonization are of interest, applicants can support and effectively serve as a convener and demonstrate sufficient knowledge, technical expertise, resources, and relationships in the industry. Applications should detail the planned cohort membership and describe engagement to date, with the understanding that the cohort may change and grow over time. Applicants should also review the Industrial Decarbonization Roadmap and indicate to which of the outlined actions they will contribute. These actions were developed with input from industry, labs, academia, states, DOE's internal Industrial Decarbonization Joint Strategy Team, and other agencies, and indicate high priority areas that must be addressed to meet our national goals.

Following selection, selected labs will finalize a cohort of relevant stakeholders within the selected areas of interest and develop a strategy for engagement, discussion, and feedback. The cohort will identify the top areas of interest to address and establish working groups within these areas (for example, within embodied carbon quantification support, one working group may collaborate to analyze carbon intensity differences between different production methods; another may work to support development of embodied carbon tracking methodologies that are internationally accepted). In many of the above examples, since similar work is ongoing within DOE, labs should clearly indicate in their applications how they will coordinate with existing efforts, with emphasis on accelerating commercialization.

iii. Topic 2: Collaborative Alignment on Decarbonization of the Concrete and Cement Industry:

Despite the growing support for low-carbon cement, there are still commercialization hurdles to overcome for the cement industry to fully decarbonize. The Pathways to Commercial Liftoff: Low-Carbon Cement report lists several barriers to commercial liftoff of low-carbon cement. Challenges include a lack of a robust system to universally define a cement product as "low-carbon," long-term adoption cycles for new chemistries, short-term procurement models that don't attract long term investment, structural cost increases for decarbonized processes, technology performance uncertainty, and lack of public support for projects.[34]

[34] U.S. Department of Energy, 2023. "Pathways to Commercial Liftoff: Low Carbon Cement." https://liftoff.energy.gov/industrial-decarbonization/low-carbon-cement/

Stakeholders throughout the cement industry are interested in but hesitant to adopt new processes, chemistries, and protocols for low-carbon cement. Creating universally accepted frameworks and developing best practices around low-carbon cement adoption can address uncertainty, speed procurement and adoption of novel materials and processes, and reduce associated costs, helping to alleviate adoption concerns. The Federal government can play a key role by convening stakeholders across the cement industry and coordinating with CDOs and SDOs to support development of consensus-driven practices, procedures, and harmonized frameworks for equipment and processes. Additionally, initiatives such as the Environmental Protection Agency's Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products Grant Program[35] are helping create compatibility between domestic and international protocols for emissions intensity of low-carbon cement for cross-border trade of related products and technologies.

As part of the Collaborative Alignment for Critical Technology Industries lab call, DOE expects multiple national laboratories with proven and extensive expertise and capabilities in the cement industry to partner to establish and/or build upon existing working groups consisting of stakeholders across the cement value chain. The National Labs will lead this industry working group and ensure its sustained operations over time, leveraging the convening power of the Federal government to bring different stakeholders together, publish independent technical reports and analysis (e.g., on competing approaches), and supporting industry efforts toward developing assessment tools, product performance guidelines, and common processes in coordination with CDOs and SDOs.

Based on existing studies and reports, as well as the input of external stakeholders, DOE has identified potential areas of interest for working groups of cement stakeholders to consider. This list is not meant to be prescriptive nor exhaustive. DOE expects applicants to refine the priority areas and work streams based on their knowledge and expertise of the industry. DOE does not expect RD&D or technology development work to be part of this effort as it is focused on accelerating commercialization of the technology and addressing barriers to deployment. It is expected that, where applicable, the working groups will cooperate with consortia, DOE efforts, and other related projects already working on similar issues. Areas of interest include:

- Establishing consensus around measurement, reporting and verification of carbon intensity and sequestration in novel cement chemistries.
    - Support the development and utilization of consensus-driven framework(s) for carbon dioxide removal (CDR) measurement, reporting, and verification (MRV) in collaboration with existing DOE and other Federal agency efforts. This effort will collaborate with and amplify the work performed by the FY23 BIL TCF CDR

[35] U.S. Environmental Protection Agency, 2024. "Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products." https://www.epa.gov/greenerproducts/grant-program-reducing-embodied-greenhouse-gas-emissions-construction-materials-and

MRV lab call projects[36] and work with industry to disseminate these frameworks and collect feedback on them.

- Investigate opportunities to align emission intensity measurement best practices with international protocols. This effort will work with existing efforts performed by the EPA to harmonize Environmental Product Declarations (EPDs) with international protocols to support cross-border trade of low-carbon products.
- Support establishment of common carbon intensity specifications and parameters to enable easier adoption of low-carbon cement products, processes, and technologies.

- Evaluation of low-carbon cement performance with respect to conventional cement materials
  - Effort should focus on materials that have left the research and development stage and are ready for demonstration.
  - Provide technical support for the evaluation of high TRL low-carbon cement materials in conjunction with DOE and other federal agency efforts.
- Low-Carbon Fuels, Feedstocks, and Energy Sources (LCFFES)
  - Create technoeconomic analyses of different LCFFES scenarios to support quantification of cost to adopt different types of LCFFES.
  - Develop best practices for adopting LCFFES into existing production along with identification of potential risks associated with specific LCFFES technologies.
- Financial structures for low-carbon cement procurement
  - Develop and/or evaluate potential financing structures to reduce the economic risk associated with procuring novel low-carbon cement materials.
  - Work with public organizations at the municipal and state level to evaluate potential hurdles with utilizing low-carbon cement in lieu of commonly used cement chemistries.

Application materials should specify which areas of interest applicants can support and effectively serve as a convener, as well as and demonstrate sufficient knowledge, technical expertise, resources, and relationships in the cement industry. Applications should detail the planned cohort membership and describe engagement to date, with the understanding that the

[36] U.S. Department of Energy, 2023. "DOE Selects Four National Laboratory-led Teams to Accelerate Commercialization of Carbon Dioxide Removal Technologies with $15 Million in Funding." https://www.energy.gov/technologytransitions/articles/doe-selects-four-national-laboratory-led-teams-accelerate

cohort may change and grow over time. Applicants should also review the Industrial Decarbonization Roadmap[37] and indicate to which of the outlined actions they will contribute. These actions were developed with input from industry, labs, academia, states, DOE's internal Industrial Decarbonization Joint Strategy Team, and other agencies, and indicate high priority areas that must be addressed to meet our national goals.

Following selection, selected labs will finalize a cohort of relevant stakeholders within the selected areas of interest and develop a strategy for engagement, discussion, and feedback. The cohort will identify the top areas of interest to address and establish working groups within these areas (for example, within MRV support, one working group may collaborate to determine the most widely accessible methods for measuring carbon sequestration; another may work to support development of carbon accounting methodologies that are internationally accepted). In many of the above examples, since similar work is ongoing within DOE, labs should clearly indicate in their applications how they will coordinate with existing efforts, with emphasis on accelerating commercialization.

iv. Topic 3: Collaborative Alignment on Decarbonization of Metals Industry

Despite the public and private support for decarbonized iron, steel, and aluminum (metal) products, there are still commercialization hurdles to overcome for domestic metals production to decarbonize. The Pathways to Commercial Liftoff: Industrial decarbonization report lists several barriers to adoption of low-carbon metal products, processes, and technologies. Challenges include high capital costs and technical risks associated with implementation of industrial decarbonization technologies, uncertainty around availability of recycled and low-carbon fuels and feedstocks, and market reluctance to pay for higher cost "green" products[38].

Manufacturers are starting to adopt and pilot decarbonization technologies and processes but run into constraints around capital costs and technical risks, while procurers are interested in purchasing low carbon metals but have concerns around pricing and carbon intensity quantification. Developing best practices and supporting consensus building around design, implementation, and investment in metals decarbonization technologies will support commercialization of these technologies and market readiness for low carbon metal products. The Federal government can play a key role by convening stakeholders across the metals industries and coordinating with CDOs and SDOs to support development of consensus-driven practices, procedures, and harmonized frameworks for equipment, processes, and products. Additionally, initiatives such as the Environmental Protection Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products Grant Program[39] will help create

[37] U.S. Department of Energy, 2024. "Industrial Decarbonization Roadmap." https://www.energy.gov/industrial-technologies/doe-industrial-decarbonization-roadmap

[38] U.S. Department of Energy, 2023. "Pathways to Commercial Liftoff: Industrial Decarbonization." https://liftoff.energy.gov/industrial-decarbonization

[39] U.S. Environmental Protection Agency, 2024. "Grant Program: Reducing Embodied Greenhouse Gas Emissions for Construction Materials and Products." https://www.epa.gov/greenerproducts/grant-program-reducing-embodied-greenhouse-gas-emissions-construction-materials-and

comparability between domestic and international protocols for emissions intensity of low-carbon metals for cross-border trade.

As part of the Collaborative Alignment for Critical Technology Industries lab call, DOE expects multiple national laboratories with proven and extensive expertise and capabilities in the metals industry to partner to establish a working group consisting of stakeholders across the metals value chains. The national labs will lead this industry working group and ensure its sustained operations over time, leveraging the convening power of the Federal government to bring different stakeholders together, publish independent technical reports and analysis (e.g., on competing approaches), and supporting industry efforts toward developing assessment tools, product performance guidelines, and common processes in coordination with CDOs and SDOs.

Based on existing studies and reports, as well as the input of external stakeholders, DOE has identified potential areas of interest for working groups of metals stakeholders to consider. This list is not meant to be prescriptive nor exhaustive. DOE expects applicants to refine the priority areas and work streams based on their knowledge and expertise of the industry. DOE does not expect RD&D or technology development work to be part of this effort as it is focused on accelerating commercialization of the technology and addressing barriers to its deployment. Areas of interest include:

- Consensus development around quantifying and reporting carbon intensity of metals products.
    - Support the alignment and uptake of Environmental Product Declarations (EPDs) with manufacturers in collaboration with EPA and other Federal agency efforts.
    - Establish common specifications and parameters to enable easier procurement of metal products.
- Analysis of US low-carbon iron
    - Review domestic iron availability, inclusive of ore quality, scrap availability, emissions intensity, and cost to determine different pathways to enable a domestic low carbon iron supply chain.
- Low-Carbon Fuels, Feedstocks, and Energy Sources (LCFFES)
    - Create technoeconomic analyses of different LCFFES scenarios to support quantification of cost to adopt different types of LCFFES.
    - Develop best practices for adopting LCFFES into existing production along with identification of potential risks associated with specific LCFFES technologies.
    - Develop best practices for integrating recycled materials into existing operations to maximize carbon emissions reductions.

- Align stakeholders on current state and potential growth scenarios of recycled feedstocks.

- Commodity pricing analysis
  - Analyze pricing variations of different metals production methodologies to define carbon intensity vs cost of different decarbonization pathways to better understand potential tradeoffs of different processes.

Application materials should specify which areas of interest applicants can support and effectively serve as a convener and demonstrate sufficient knowledge, technical expertise, resources, and relationships in the metals industries. Applications should detail the planned cohort membership and describe engagement to date, with the understanding that the cohort may change and grow over time. Applicants should also review the Industrial Decarbonization Roadmap and indicate to which of the outlined actions they will contribute. These actions were developed with input from industry, labs, academia, states, DOE's internal Industrial Decarbonization Joint Strategy Team, and other agencies, and indicate high priority areas that must be addressed to meet our national goals.

Following selection, selected labs will finalize a cohort of relevant stakeholders within the selected areas of interest and develop a strategy for engagement, discussion, and feedback. The cohort will identify the top areas of interest to address and establish working groups within these areas (for example, LCFFES activities could include working groups working to develop best practices for utilizing hydrogen as a fuel for process heat and/or to analyze improvements around recycled feedstock content). In many of the above examples, since similar work is ongoing within DOE, labs should clearly indicate in their applications how they will coordinate with existing efforts, with emphasis on accelerating commercialization.

C. Timeline and Process Logistics

Timeline

See the Executive Summary for timeline and key dates.

Process Logistics

All communication to DOE regarding this lab call must use TCF.BIL@hq.doe.gov and identify lab call DE-LC-000L004 in the subject line of the email.

QUESTIONS DURING OPEN LAB CALL PERIOD: Specific questions about this lab call should be submitted by emailing TCF.BIL@hq.doe.gov. Answers to frequently asked questions for this lab call can be found at https://oced-exchange.energy.gov/. Answers to frequently asked questions for the Exchange system can be found at https://oced-exchange.energy.gov/FAQ.aspx. To view announcement-specific questions, applicants must first select the specific lab call number. OTT will attempt to respond to a question within three business days unless a similar question and

the answer have already been posted on the website. It is the expectation of DOE that applicants to this lab call will review the frequently asked questions before submitting a question. Questions related to the registration process and use of the website should be submitted to OCED-ExchangeSupport@hq.doe.gov. Please include the lab call title and number in the subject line. To ensure fairness for all lab participants, any questions directed to individual DOE staff will be forwarded to TCF.BIL@hq.doe.gov for processing.

D. Key Considerations and Requirements

- **SIZE, SCOPE, AND NUMBER OF SELECTIONS:**
    - Estimated DOE funding available: approximately $15 million in IRA funding (anticipated $3 million to $8 million of DOE funding per project)
    - Estimated number of projects: 3 (1 per topic area)
    - Estimated project duration: 24-36 months
    - DOE expects that any lab included or referenced on a proposed project will actively contribute toward the proposed project outcomes. Engagement on the project should be reflected in specific projects' tasks and budgets. DOE expects that meeting program objectives will require input from multiple labs and thus, that the strongest proposals will involve multiple labs.
    - The budget size, tasks, and scope of proposed projects can be adjusted by DOE during selections and negotiations. The number of selections will depend on the number of meritorious proposals and the available funding.
- **COST-SHARE:** This lab call is subject to Section 988(b)(3) of EPAct05[40] regarding cost-share, which requires 50% cost-share for demonstration and commercialization activities[41]. However, DOE acknowledges that some potentially high impact proposed projects may not be able to meet this requirement. In this case, labs may apply with less than 50% cost-share, clearly indicating in the application the amount of cost-share they intend to contribute and providing a justification for the cost-share reduction.[42] The review criteria reflect that cost-share is a consideration for selection. DOE is also sensitive to the importance of maintaining the independence of these working groups and the risk of having

[40] Energy Policy Act, 2005, Public Law 109-58, 109th Cong. (August 8, 2005), 119 Stat. 910, Section 988(b)(3). https://www1.eere.energy.gov/femp/pdfs/epact_2005.pdf.
[41] Please see Appendix A: Additional TCF Cost-Share and Nonfederal Cost-Share Information for more information, including what qualifies as cost-share.
[42] Cost-share contribution requirement cannot be eliminated for demonstration and commercial application activities.

specific industry stakeholders provide a disproportionate amount of cost-share, therefore appearing to have a particular influence on the findings and recommendations. DOE encourages labs to avoid teaming arrangements that could appear as undermining the impartiality of the working groups.

- **INTELLECTUAL PROPERTY:** This project is not anticipated to create any inventions or intellectual property. Partner organizations are expected to share pre-competitive, non-proprietary information to address common challenges. Performing labs are expected to create an environment in which partners are comfortable sharing different pre-competitive information. Performing labs should put in place plans to address IP, should any IP be created in during the life of the project.

- **COMMUNITY BENEFITS PLAN:** DOE is committed to investing in the research, development, and commercialization of innovations from DOE National Laboratories and DOE plants and sites, that deliver benefits to the American public and lead to technologies and products that foster sustainable, resilient, and equitable access to clean energy. Further, DOE is committed to supporting the development of more diverse, equitable, inclusive, and accessible workplaces to help maintain the nation's leadership in science and technology. To support the goal of building a clean and equitable energy economy, projects funded under this lab call are expected to (1) advance diversity, equity, inclusion, and accessibility (DEIA); (2) support Justice40[43] priorities; and (3) invest in quality jobs. It is a priority of this lab call to ensure that a diverse group of stakeholders are included in the working groups to be established, including the communities that be impacted by these critical energy technologies. To ensure these goals are met, applications must include a community benefits plan that describes how the proposed project would incorporate the objectives previously stated.

  Applicants are encouraged to engage with established community-based organizations that demonstrate the applicant's ability to achieve the above goals as outlined in the community benefits plan. Within the community benefits plan, the applicant is encouraged to provide specific details on how to ensure the project will deliver measurable community and jobs benefits. See Section II.A.ii. for the community benefits plan content requirements.

  Applicants are required to describe how DEIA objectives will be incorporated in the project. Applicants are required to describe the actions the applicant will take to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project. The proposed project should include at least one specific, measurable, assignable, realistic and time-related (SMART)

[43] U.S. Department of Energy, 2022, "Justice40 Initiative." https://www.energy.gov/justice/justice40-initiative

milestone per budget period supported by DEIA-relevant metrics to measure the success of the proposed actions. Please refer to Section II.A. for the full set of application requirements. Because a diverse set of voices at the table in research design and execution has an illustrated positive impact on technology adoption and deployment, this implementation strategy for the proposed project will be evaluated as part of the application review process.

Further, projects are particularly encouraged to include minority-serving institutions,[44] minority business enterprises, minority-owned businesses, woman-owned businesses, veteran-owned businesses, or entities located in an underserved community in the working groups.

- **NATIONAL LABORATORY COLLABORATION:** DOE strongly encourages projects that bring together multiple labs to leverage diverse lab capabilities, avoid duplication of effort, and ensure the most comprehensive possible applications are put forward.

- **TEAMING PARTNER LIST:** DOE anticipates that meeting project goals will require multi-lab projects with significant industry engagement and partnership. To expedite external partnerships in support of this lab call, DOE is compiling a "Teaming Partner List" to facilitate the formation of new project teams. The Teaming Partner List allows organizations who may wish to participate in an application to express their interest to other applicants and to explore potential partnerships.

  Updates to the Teaming Partner List will be available in the Exchange website. The Teaming Partner List will be regularly updated to reflect new teaming partners who provide their organization's information.

  Submittal instructions: Any organization that would like to be included on this list should find the Teaming Partner List for this solicitation (TPL-0000002) on eXCHANGE and submit the following information: organization name, organization type, website, contact name, contact address, contact email, contact phone, area of expertise, brief description of capabilities, and applicable topic. Please refer to the Manuals section on Exchange for more detailed instructions on using the Teaming Partner List.

  Disclaimer: By submitting a request to be included on the Teaming Partner List, the requesting organization consents to the publication of the submitted information. By enabling and publishing the Teaming Partner List, DOE is not endorsing, sponsoring, or otherwise evaluating the qualifications of the individuals and organizations that are identifying themselves for placement on this Teaming Partner List. DOE will not pay for

[44] Minority-serving institutions, including historically black colleges and universities/other minority institutions, as educational entities recognized by the Office of Civil Rights, U.S. Department of Education, and identified on the Office of Civil Rights' Department of Education U.S- accredited postsecondary minority institutions list. (See https://www2.ed.gov/about/offices/list/ocr/edlite-minorityinst.html.)

the provision of any information, nor will it compensate any applicants or requesting organizations for the development of such information.

- **CURRENT AND FUTURE PARTNERSHIPS:** DOE recognizes and encourages national laboratories to work in close partnership (as subrecipients or project partners) with specific companies on financial assistance awards. Existing or future collaboration with industry will not make national labs ineligible to participate to this announcement, but applicants must clearly specify what measures are taken to segregate different work streams, avoid knowledge spillovers from work with an individual company, and maintain the national lab's role as a trusted independent party.

II. Application Submission and Review Information

A. Process and Submission Details

i. Process

- **ELIGIBILITY:** Only DOE national laboratories and facilities are eligible for funding from this lab call. **Proposals that involve more than one laboratory are expected.**

  To be eligible to apply to this call, a full application must be submitted per guidelines below.

  - Laboratories are expected to coordinate on the application submission internally and with multi-lab collaborators.
  - Applications that fall outside the parameters specified in Section I.D will be deemed nonresponsive and will not be reviewed or considered.

- **PARTNERS:** Partners can be any nonfederal entity, including private companies, state or local governments (or entities created by a state or local government), colleges, universities, tribal entities, or nonprofit organizations. Partners must agree to engage in activities that focus on commercializing or deploying technologies in the marketplace and are highly encouraged to provide cost-share.

- **SUBMISSION:** To apply to this lab call, the team lead must register and sign in with their lab email address and submit application materials through eXCHANGE. Application materials must be submitted through eXCHANGE.

  Applicants are strongly encouraged to submit their full applications at least 48 hours in advance of the submission deadline.

  eXCHANGE is designed to enforce the deadlines specified in this lab call. The "Apply" and "Submit" buttons will automatically disable at the defined submission deadlines. If an applicant experiences technical difficulties with a submission, the applicant should

contact the eXCHANGE help desk for assistance (OCED-ExchangeSupport@hq.doe.gov.) The eXCHANGE help desk and/or the eXCHANGE system administrators will assist applicants in resolving issues.

Note that all partnerships between the labs and outside partners must comply with individual lab requirements under their management and operating contracts.

ii. Application Requirements

Applications are required to be eligible to receive funding under this solicitation. Application materials must be submitted through eXCHANGE.

APPLICATIONS ARE DUE BY THE DATE AND TIME LISTED IN THE EXECUTIVE SUMMARY TIMELINE. DOE WILL NOT ACCEPT FULL APPLICATIONS AFTER THE DEADLINE.

Applications should be formatted for 8.5 x 11 paper, single-spaced, and have 1-inch margins on each side. Typeface size should be 11-point font, except tables and figures, which may be in 10-point font. All application documents must be marked with the control number issued to the applicant. Applicants will receive a control number upon clicking the "Create Application" button in eXCHANGE, and should include that control number in the file name of their application submission (i.e., Control number_Lab Acronym_PD Last Name_Application)

If applicants exceed the maximum page lengths indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

Proposals should be no more than 10 single-spaced pages total, should be in a single PDF file format, and must include the following components under headings corresponding to the bullets below:

- **Title page:** The title page is not counted in the page limit and should include the proposal title, topic being applied for, PD(s) and business points of contact, names of all team member organizations, any statements regarding confidentiality, the amount of federal funding requested, the proposed cost-share amount, the topic being applied to, a 200-or-fewer-word summary of the project suitable for public release if the project is funded. Include name, address, phone number, and email address of the lead applicant (organization) for contract and project issues.

- **Summary:** The summary provided should be one page in length and should provide a truncated explanation of the PD's relevant experience engaging with industry stakeholders; the proposed consortium; a clearly defined, easily communicated, end-of-project goal; and a high-level overview of estimated project budget, listing an estimated breakdown for each proposed year, separated by lab partners. The applicant should discuss the impact DOE funding would have on the proposed project. Applicants should specifically explain how DOE funding, relative to prior, current, or anticipated funding from other public and private sources, is necessary to achieve the project objectives.

- **Consortium structure:** Describe each recipient's role and responsibility, as well as how individual efforts will be coordinated to achieve the overall project goal and how the consortium will be structured to focus on specific areas of interest (i.e. a simplified draft of the consortium charter). The applicant should describe the specific impact of the proposed project, the differentiation and potential synergies with current and emerging programs and consortia, and the overall impact on advancing the baseline if the project is successful. Applicants should also describe existing capabilities within their team's lab facilities that can be leveraged to support this effort.

- **Project description:** Describe the project in enough detail that it may be evaluated for its impact and relevance to the topic objectives. Describe the expected national laboratory member resources, including prior experience working with or engaging industry stakeholders, business development expertise, proposed work areas, staff time, industry engagement resources, and any facility/equipment needs. Include specific locations and laboratories to be used. This description should also emphasize how this project focuses on commercialization and addresses adoption readiness challenges[45]. The applicant should clearly specify the expected output(s) and outcome(s) of the project and identify any next-stage commercialization or resource needs, if appropriate.

- **Engagement plan:** Applicants must describe how they will engage with their relevant industry stakeholders and how industry participants will be organized and their expertise leveraged. There should be emphasis on ensuring participation of all relevant stakeholders, effectively building consensus, and incentivizing implementation. There should also be an overview of how findings and related outputs from the consortia will be disseminated to industry.

- **Community Benefits Plan:** This section must set forth the applicant's approach to ensuring the federal investments advance the following three objectives: (1) advancing DEIA; (2) contributing to the Justice40 Initiative and other considerations linked with energy and/or environmental justice; and (3) investing in quality jobs. Applicants must address all three sections. This section should include at least one Specific, Measurable, Achievable, Relevant, and Timely (SMART) milestone per budget period to measure progress on the proposed actions. Applicants must describe the future implications or a milestone-based plan for identifying future implications of their project on energy and/or environmental justice, including, but not limited to, benefits for the U.S. workforce. SMART goals will be evaluated as part of the review process. DOE will evaluate the recipient's progress towards SMART goals throughout the life of the award, including as part of the Go/No-Go review process.

    - **Diversity, Equity, Inclusion, and Accessibility:** To build a clean and equitable energy economy, it is important that there are opportunities for people of all racial, ethnic,

[45] U.S. Department of Energy, 2024 "Adoption Readiness Levels (ARL): A Complement to TRL." https://www.energy.gov/technologytransitions/adoption-readiness-levels-arl-complement-trl

socioeconomic, and geographic backgrounds, sexual orientation, gender identity, persons with disabilities, and those re-entering the workforce from incarceration. This section of the plan must demonstrate how DEIA is incorporated in the project objectives. The plan must identify the specific action the applicant would take that integrates into the project goals and project teams. Submitting an institutional DEIA plan without specific integration into the project will be deemed insufficient.

- **The Justice 40 Initiative[46] and other considerations linked with energy and/or environmental justice:** This section should include information on how the project will advance the Justice40 Initiative's goal. In addition, this section must articulate the applicant's consideration of long-term equity implications of the project and any implications for environmental justice. It must identify how the specific project integrates equity and environmental justice considerations into the project design to support equitable outcomes for affected communities if the project is successful. Like cost reductions and commercialization plans, the Community Benefits Plan requires description of the implications of the project for affected communities.
- **Investing in Quality Jobs:** This section must articulate the applicant's consideration of long-term workforce impacts and opportunities of the project. It must identify how the project is designed and executed to include an understanding of the future workforce needs if the project is successful. These needs may be uncertain, occur over a long period of time, and/or have many factors within and outside the specific proposed project. Applicants are encouraged to describe the influencing factors and the most likely workforce and community implications of the proposed project if the effort is successful, as well as energy and/or environmental justice implications.

- **Work plan:** This section is to list the key tasks and provide brief descriptions for each task, including roles and responsibilities of any partners. Define the key milestones to be addressed by the project, including SMART milestones, and quarterly progress measures, with dates and specific descriptions of what should be accomplished to meet the milestones. This section should address key risks to achieving stated goals and the steps to be taken to minimize those risks.

  The work plan should include a high-level project scope, work breakdown structure, milestones, go/no-go decision points, and project schedule. A detailed work breakdown structure is requested separately.

[46] Pursuant to EO 14008, "Tackling the Climate Crisis at Home and Abroad," January 27, 2021, and the Office of Management and Budget's Interim Justice40 Implementation Guidance M-21-28 and Addendum M-23-09, DOE recognizes disadvantaged communities as the census tracts identified as disadvantaged by the White House Council on Environmental Quality's Climate and Economic Justice Screening Tool (CEJST), located at https://screeningtool.geoplatform.gov/, as well as all Federally Recognized Tribes (whether or not they have land). See https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf. DOE's Justice40 Implementation Guidance is located at https://www.energy.gov/media/277188

- **Impact tracking**: DOE has an obligation to report on TCF implementation and impact. As such, all projects must incorporate clear impact tracking strategies.

  Proposals must describe how, if funded, the proposed project would measure success during and after the funded period. Recipients must report every year over a 5-year time period, which includes the up-to-3-year project period and any relevant time period afterward to reach the entire 5-year time period.

  Proposals must describe how the team will implement and track impact metrics. Proposals must include outcome-focused metrics that are most applicable for the proposed project and describe how and when the team will track and report against those metrics. Metrics should focus on outcomes that show traction and not steps or deliverables the team has complete control over. If the project is selected, OTT will provide a metric input form for impact metrics reporting.

  Specific targets for identified metrics should be provided, as appropriate. Applicants should consider short-, medium-, and long-term goals when identifying metrics. Sample metrics are shown below and should be tailored to the nature of the submitted proposal. For example, for a metric of "partnerships," the nature of the engagement or partnership must be specified.

  - Acceptable metrics may include but are not limited to: (1) number of engagements performed as part of project activities; (2) the number of validated documents created through project activities; (3) number of validated documents successfully operationalized; (4) number of formal partnerships established; and (5) number of commercialized technologies as a result of project activities.
  - Unacceptable metrics include but are not limited to: (1) general reports describing activities; (2) exploratory experiments that lack a goal; (3) unverifiable data; (4) time spent on project; and (5) other subjective, vague, and/or ambiguous metrics.

- **Cost-sharing**: Clearly indicate the expected cost-share contribution for the proposed project. Please provide a justification if cost-share of less than 50% is proposed. Provide a detailed table describing any proposed cost-sharing, clearly articulating cash versus in-kind. See Appendix A for additional cost-share information and requirements.

- **Proposed budget:** Provide an Excel spreadsheet with the minimum budget of all project expenses by each national lab and project partner. DOE will not allow pre-project costs. The minimum budget should include a high-level summary of the main project components that could be included at that cost. Please also provide a recommended budget broken out by tasks, where the total budget is the sum of the tasks. This is to itemize the cost estimate (total) for each task, with total costs for the project. Additionally, the recommended budget should be broken down by cost category (for

example, personnel, travel, equipment, supplies, contractual, indirect, etc.). Other sources of funding, including cost-share information, shall be provided here, if applicable.

These details are not counted toward the full application page limit and should be included as a separate submission.

- **References and letters of support:** Single-page references and letters of support are not counted toward the 10-page limit and should be included in the application as an appendix. All proposed partners must provide a letter of support confirming their intent to participate in the proposed project.
- **Team resumes:** Include single page resumes of key project participants. These are not counted toward the 10-page limit and should be included in the application as an appendix.
- **Project summary slide for public release:** The project summary slide must be suitable for dissemination to the public, and it must not exceed one PowerPoint slide. The slide does not count toward the full application page limit (10 pages) and should be included as a separate file. This slide must not include any proprietary or business-sensitive information, because DOE may make it available to the public if the project is selected for funding. The document must conform to this naming convention: Control number_Lab Acronym_PD Last Name_Summary Slide. The summary slide requires the following information:
    - A project summary.
    - A description of the project's impact.
    - Proposed project goals.
    - Any key graphics (illustrations, charts, and/or tables).
    - The project's key idea/takeaway.
    - Project title, prime recipient, PI, and key participant information.
    - Requested TCF funds and proposed applicant cost-share.

iv. Proprietary Information

Applicants should not include in their proposals trade secrets or commercial or financial information that is privileged or confidential, unless such information is necessary to convey an understanding of the proposed project or to comply with a requirement in this solicitation. Proposals that contain trade secrets or commercial or financial information that is privileged or confidential and that the applicant does not want disclosed to the public or used by the government for any purpose other than proposal evaluation must be marked as described below. A cover sheet, which does not count toward the page limits, must be marked as follows

and must identify the specific pages that contain trade secrets or commercial or financial information that is privileged or confidential:

> **"Notice of Restriction on Disclosure and Use of Data:**
>
> Pages [list applicable pages] of this document may contain trade secrets or commercial or financial information that is confidential and is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the government. The government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source."

The header and footer of every page that contains trade secrets or privileged commercial or financial information must be marked as follows:

"May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure."

In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged or confidential must be enclosed in brackets.

The previously referenced markings enable DOE to follow the provisions of 10 CFR 1004.11(d) in the event a Freedom of Information Act (FOIA) request is received for information submitted with a proposal. Failure to comply with these marking requirements may result in the disclosure of the unmarked information under a FOIA request or otherwise. The U.S. government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

Subject to the specific FOIA exemptions identified in 5 U.S.C. 552(b), all information submitted to OTT by an applicant is subject to public release under the Freedom of Information Act, 5 U.S.C. §552, as amended by the OPEN Government Act of 2007, Pub. L. No. 110-175. It is the proposer's responsibility to review FOIA and its exemptions to understand:

1. What information may be subject to public disclosure.
2. What information applicants submit to the government that is protected by law.

In some cases, DOE may be unable to make an independent determination regarding which information submitted is releasable and which is protected by an exemption. In such cases, DOE will consult with the applicant in accordance with 10 C.F.R. §1004.11 to solicit the proposer's views on how the information should be treated.

B. Application Review and Selection

i. Application Merit Review and Selection Process

Selection of winning proposals will be determined based on available funding and input from reviewers. In general, DOE will use data and other information contained in proposals for

evaluation purposes only, unless such information is generally available to the public or is already the property of the government.

Please note the weighting of the criteria below, as DOE highly encourages bold, innovative, and impactful proposals.

The categories and relative ranking criteria used to evaluate submissions will be as follows:

Criterion 1: Impact on Industry (30%)

This criterion involves consideration of the following factors:

- How impactful is the project, assuming the stated outcomes can be achieved as written?
    - Impactful—the extent to which the proposed project, if successful, impacts the core goals outlined in the lab call as well as the root causes (inside and outside of the labs) of the existing commercialization challenges and barriers. This also includes the impact of forging collaborations on the challenges being addressed (e.g., multi-lab and industry-leveraged effort), as well as the impact of collaboration on other interested and impacted stakeholders (e.g., through collaboration with stakeholders outside of the national labs).
    - Accelerates speed of commercialization—the degree to which the proposal has the potential to accelerate the speed of commercialization, to move quickly, and to embrace agility with the proposed project; and the degree to which the proposal supports achieving the statutory requirement of the TCF to "promote promising energy technologies for commercial purposes."
    - Long-term viability—the degree to which the proposal has the potential to continue to be impactful without long-term, continued, direct funding from DOE; the extent to which multiyear strategic partnerships are proposed or will be developed to continue the program beyond initial funding; and the level of proposed cost-share for the project will be taken into consideration.
- Is the proposal likely to result in implementation of recommendations, over and beyond publishing best practices? Is the proposal likely to lead to outcomes that are adopted?
    - Commercialization outcomes—the likelihood of the proposed solution achieving the proposed commercialization outcome metrics; the likelihood of the proposed project leading to outcomes that are actionable by industry; and the likelihood of the proposed team tracking and reporting on the commercialization outcome metrics.

Criterion 2: Coordination and Milestones (30%)

This criterion involves consideration of the following factors:

- Are the stated plans for coordinating the working group(s) and cooperating with related efforts reasonable, synergistic, differentiated from existing work and scalable?
    - Reasonable – the burden of convening and participating in the project is acceptable to a variety of stakeholders, not only to larger organizations with significant resources. The working groups and teams that are formed should not be redundant and should have focused objectives that complement the larger project goal.
    - Synergistic – exiting groups, projects, and efforts should be factored into the development of this project. This project should leverage existing work and build upon existing efforts rather than trying to replicate already existing work.
    - Differentiated—the extent of differentiation with respect to existing commercialization programs or efforts and the potential to enhance commercialization activities at the national laboratories.
    - Sustainable—the likelihood that the proposed solution, if successful, could be sustained and expanded to have a broader impact and that the working group, if successful, could be scaled to include new stakeholders and become self-sustaining.
- Are the stated goals of the project SMART, and are they likely to be accomplished within the scope of this project? Is there a likelihood of success for the proposed project?
    - Measurable—the degree to which the proposal is structured to produce a measurable result/impact, including the required DEIA milestones and the extent to which the applicant shows a clear understanding of the importance of SMART, verifiable milestones and proposes milestones that demonstrate clear progress, are aggressive but achievable, and are quantitative.
    - Risks mitigated—the extent to which the applicant understands and discusses the risks, core barriers, and challenges the proposed work will face, and the soundness of the strategies and methods that will be used to mitigate risks and the degree to which the proposal adequately describes how the team will manage and mitigate risks.
    - Reasonable assumptions—the reasonableness of the assumptions used to form the execution strategy (e.g., lab staff participation, costs, throughput at full scale, speed of proposed scale-up or adoption, and mode of long-term funding).
    - Reasonable budget—the reasonableness of the overall funding requested to achieve the proposed project and objectives; the reasonableness and clarity of the budget and scope options; and the level of proposed cost-share for the project will be taken into consideration.

Criterion 3: Team Experience and Expertise (30%)

This criterion involves consideration of the following factors:

- Is the team well-qualified and positioned to successfully complete this project?
    - Collaboration—the extent to which there are multiple labs engaged on the proposed project; the degree to which the proposed project branches out, connects, and builds on the innovation ecosystem across the country; and the extent to which connections and alliances are forged to harness the power of regional economies, state/local organizations, and other federal, state, or local agencies.
    - Capability—the extent to which the training, capabilities, and experience of the assembled team will result in the successful completion of the proposed project, and the extent to which this team (including proposed subrecipients) has the expertise and experience to be able to achieve the results on time and to specification.
    - Participation—the level of participation by project participants, as evidenced by letter(s) of commitment and how well they are integrated into the work plan; the degree to which multi-lab, internal lab, and external collaboration is proposed; and the extent to which teams include representation from diverse entities, such as, but not limited to: minority-serving institutions, including historically black colleges and universities/other minority institutions, or through linkages with opportunity zones.
    - Commitment—the extent to which the final project team required to complete this project is fully assembled and committed to the project (e.g., are there any key members that are “to be hired” in the future?).
    - Validated—the degree to which the proposed project fits within and builds on the laboratory ecosystem and the level of validation (letters of support/interest, partners, customer trials, data from prior work, report references, etc.).
    - Access—the extent to which the team has access to facilities, equipment, people, expertise, data, knowledge, and any other resources required to complete the proposed project.
- Does the team bring the requisite experience in business development and engaging with the identified industry?
    - Business development – the applicant has prior experience engaging with a variety of industry stakeholders. Project performers have applicable experience in business development and can articulate the value proposition of this effort

to industry partners and meaningfully incorporate their feedback into the project.

- Industry engagement – the project has access to appropriate resources and personnel to amplify its efforts. The applicant can exhibit existing and past collaboration with relevant industry stakeholders that can be expanded upon in this project.

Criterion 4: Community Benefits Plan: Job Quality and Equity (Community Benefits Plan) (10%)

This criterion involves consideration of the following factors:

- DEIA goals—the extent to which the community benefits plan includes specific and high-quality actions to meet DEIA goals, which may include DEIA recruitment procedures; partnerships with workforce training or support organizations serving workers facing systematic barriers to employment; and other DEIA commitments.
- Community evaluation—the extent to which the community benefits plan identifies specific, measurable benefits for disadvantaged communities; how the benefits will flow to disadvantaged communities; and how negative environmental impacts affecting disadvantaged communities would be mitigated.
- Equitable—the extent to which the project would contribute to meeting the objective that 40% of the benefits of climate and clean energy investments will flow to disadvantaged communities.

Other Selection Factors:

In addition to the previous criteria, the selection official may make additional considerations in determining which full applications to select for negotiations, such as:

- The degree to which the proposed project (or portions thereof) is replicable within other industries, technologies, or facilities.
- The degree to which the proposed project, including proposed cost-share, optimizes the use of available DOE funding to achieve programmatic objectives.
- The level of industry involvement and demonstrated ability to accelerate demonstration and commercialization and overcome key market barriers.
- The degree to which the proposed project is likely to lead to increased high-quality employment and manufacturing in the United States.
- The degree to which the proposed project, or group of projects, represent a desired geographic distribution (considering past awards and current applications).
- The degree to which the proposed project incorporates applicant or team members from minority-serving institutions and partnerships with minority business enterprises, minority-owned businesses, woman-owned businesses, veteran-owned businesses, or tribal nations.

- The degree to which the proposed project will develop new or deepen nascent relationships between labs, partners, and DOE.
- The degree to which the proposed project avoids duplication/overlap with other publicly or privately funded work.
- The degree to which the proposed project leverages past and current efforts to achieve project objectives.
- The degree to which the project's solution or strategy will maximize deployment or replication.
- The degree to which the project promotes increased coordination with nongovernmental entities for commercialization and demonstration of technologies and research applications to facilitate technology transfer.

iii. Selection for Project Negotiation

DOE carefully considers all information obtained through the selection process. DOE may select or not select a proposal for negotiations. DOE may also postpone a final selection determination on one or more proposals until a later date, subject to availability of funds and other factors. OTT will notify applicants if they are, or are not, selected for negotiations.

DOE will only select proposed projects that support the statutory requirement of the TCF to "promote promising energy technologies for commercial purposes" and advance the goals of IRA Section 50161, Advanced Industrial Facilities Deployment.

Type of funding instrument: TCF IRA projects will be documented and funded through OTT's work authorization and funds management processes within the Program Information Collection System. DOE facilities will be required to track federal funds in accordance with normal departmental processes and all applicable requirements (see Section II.C. Project Administration and Reporting). DOE facilities will also be required to track nonfederal funds in accordance with established DOE facility accounting processes.

DOE will direct transfer funding to the relevant labs; lab-to-lab transfers should not be needed.

All partnerships between the labs and outside partners must comply with individual lab requirements under their management and operating contracts.

iv. Selection Notification

DOE anticipates completing the selection and negotiation process by Q1 FY25 (subject to change). DOE will notify lab leads electronically of selection results. All of DOE's decisions are final when communicated to applicants.

C. Project Administration and Reporting

Selected projects are managed by the DOE facilities in accordance with their requisite policies and procedures.

OTT will provide all required project oversight and engagement with TCF project recipients; DOE program offices participating in this lab call are encouraged to engage as well.

TCF project recipients will be required to meet quarterly with OTT and supporting DOE program offices to discuss project progress in addition to providing quarterly progress reporting, annual metrics reporting for the entire 5-year period, and a final report at the end of the project.

Additional reporting requirements apply to projects funded by IRA. As part of tracking progress toward key departmental goals—ensuring justice and equity, investing in the American workforce, boosting domestic manufacturing, reducing greenhouse gas emissions, and advancing a pathway to private sector deployment—DOE may require specific data collection. These include:

- Justice and equity data, including:
    - Minority business enterprises, minority-owned businesses, woman-owned businesses, and veteran-owned businesses.
    - Other DEIA-relevant indicators.
- Funding leveraged, follow-on-funding, intellectual property generation and intellectual property utilization.
- Reporting, tracking, and segregation of incurred costs.
- Publication of information on the internet.
- Access to records by Inspectors General and the Government Accountability Office.
- Ensuring laborers and mechanics employed by contractors or subcontractors on IRA-funded projects are paid wages equivalent to prevailing wages on similar projects in the area.
- Protecting whistleblowers and requiring prompt referral of evidence of a false claim to an appropriate inspector general.
- Certification and registration.

Recipients of funding appropriated by the IRA must comply with requirements of all applicable federal, state, and local laws, regulations, DOE policy and guidance, and instructions in this solicitation. Recipients must flow down the requirements to subrecipients to ensure the recipient's compliance with the requirements.

D. Questions

Specific questions about this lab call should be submitted via email to TCF.BIL@hq.doe.gov. To ensure fairness across all labs, individual DOE staff cannot answer questions while the lab call remains open. To keep all labs informed, DOE will post all questions and answers on Exchange.

Appendix A: Additional TCF Cost-Share and Nonfederal Cost-Share Information

Cost-share funds are subject to audit by the department or other authorized government entities (e.g., Governmental Accountability Office). A written agreement may be advisable—either between the DOE facility and the third party or between the cooperative research and development agreement partner and the third party—that requires the third party to provide the cost-share funds. Consult your DOE facility legal staff for advice about how to obligate the third party to provide the cost-share funds, and to ensure the cost-share funds meet the requirements for in-kind contributions, if applicable. The lead DOE facility is responsible for any funding gap should a TCF project fail to obtain from partners or other collaborators the required cost-share from nonfederal sources.

All relevant laws, DOE directives, and contractual obligations apply. Consult your DOE facility's legal staff for advice about foreign partners and agreements with the DOE facility.

Applicants must make sure their prospective partnership arrangements comply with all DOE directives and conditions.

WHAT QUALIFIES FOR NONFEDERAL COST-SHARE

Please consult the Federal Acquisition Regulations for the applicable cost-sharing requirements.

In addition to the regulations referenced previously, other factors may also come into play, such as timing of in-kind contributions and length of the project period. For example, the value of 10 years of donated maintenance on a project that has a project period of 5 years would not be fully allowable. Only the value for the 5 years of donated maintenance that corresponds to the project period is allowable and may be counted.

As stated previously, the rules about what is allowable are generally the same within like types of organizations. The following are the rules found to be common, but again, the specifics are contained in the regulations and cost principles specific to the type of entity:

A. Acceptable contributions. All contributions, including cash contributions and third-party in-kind contributions, must be accepted as part of the prime recipient's nonfederal match if such contributions meet all the following criteria:

   1. They are verifiable from the recipient's records.

   2. They are not included as contributions for any other federally assisted project or program.

   3. They are necessary and reasonable for the proper and efficient accomplishment of project or program objectives.

   4. They are allowable under the cost principles applicable to the type of entity incurring the cost.

5. They are not paid by the federal government under another award unless authorized by federal statute.

6. They are provided for in the approved budget.

B. Valuing and documenting contributions.

1. Valuing recipient's property or services of recipient's employees. Values are established in accordance with the applicable cost principles, which means that amounts chargeable to the project are determined on the basis of costs incurred. For real property or equipment used on the project, the cost principles authorize depreciation or use charges. The full value of the item may be applied when the item will be consumed in the performance of the project or fully depreciated by the end of the project. In cases where the full value of a donated capital asset is to be applied as nonfederal cost-share funds, that full value must be the lesser of the following:

a) The certified value of the remaining life of the property recorded in the recipient's accounting records at the time of donation; or

b) The current fair market value. If there is sufficient justification, the contracting officer may approve the use of the current fair market value of the donated property, even if it exceeds the certified value at the time of donation to the project. The contracting officer may accept the use of any reasonable basis for determining the fair market value of the property.

2. Valuing services of others' employees. If an employer other than the recipient furnishes the services of an employee, those services are valued at the employee's regular rate of pay, provided these services are for the same skill level for which the employee is normally paid.

3. Valuing volunteer services. Volunteer services furnished by professional and technical personnel, consultants, and other skilled and unskilled labor may be counted as nonfederal cost-share if the service is an integral and necessary part of an approved project or program. Rates for volunteer services must be consistent with those paid for similar work in the recipient's organization. In those markets in which the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market in which the recipient competes for the kind of services involved. In either case, paid fringe benefits that are reasonable, allowable, and allocable may be included in the valuation.

4. Valuing in-kind contributions by third parties.

a) Donated supplies may include such items as office supplies or laboratory supplies. Value assessed to donated supplies included in the nonfederal match share must be reasonable and must not exceed the fair market value of the property at the time of the donation.

b) Normally only depreciation or use charges for equipment and buildings may be applied. However, the fair rental charges for land and the full value of equipment or other capital assets may be allowed, when they will be consumed in the performance of the project or fully depreciated by the end of the project, provided that the contracting officer has approved the charges. When use charges are applied, values must be determined in accordance with the usual accounting policies of the recipient, with the following qualifications:

   i. The value of donated space must not exceed the fair rental value of comparable space as established by an independent appraisal of comparable space and facilities in a privately owned building in the same locality.

   ii. The value of loaned equipment must not exceed its fair rental value.

5. Documentation. The following requirements pertain to the recipient's supporting records for in-kind contributions from third parties:

   a) Volunteer services must be documented and, to the extent feasible, supported by the same methods used by the recipient for its own employees.

   b) The basis for determining the valuation for personal services and property must be documented.

Appendix B: Related programs and projects

The below identified organizations and programs have efforts related to this lab call. Project performers are recommended to communicate with these entities as appropriate to achieve the objectives of this program. This list is not exhaustive, and project performers are encouraged to expand their outreach to encompass the full value chain of their identified industry.

Organization/Program Title	Industry
Electrified Processes for Industry Without Carbon (EPIXC)	All
Industrial Heat Shot™ | DOE	All
Industrial Technology Innovation Advisory Committee	All
Manufacturing USA Institutes	All
American Institute for Chemical Engineers	Chemicals & Refining
Center for Energy Initiatives (CEI)	Chemicals & Refining
Clean Fuels & Products Shot™ | DOE	Chemicals & Refining
Rapid Advancement in Process Intensification Deployment Institute (RAPID)	Chemicals & Refining
Regional Biomass Resource Hub Initiative	Chemicals & Refining
Reducing EMbodied-energy And Decreasing Emissions (REMADE)	Chemicals & Refining Metals
Cement and Concrete Center of Excellence | IEDO	Concrete & Cement
Low Carbon Cements and Concretes Consortium | NIST	Concrete & Cement
NEU - An ACI Center of Excellence for Carbon Neutral Concrete	Concrete & Cement
Federal Buy Clean Initiative | Office of the Federal Chief Sustainability Officer	Concrete & Cement Metals
First Movers Coalition	Concrete & Cement Metals
Label Program for Low Embodied Carbon Construction Materials | EPA	Concrete & Cement Metals
American Iron and Steel Institute	Metals
Center for Steel Electrification by Electrosynthesis | Argonne National Laboratory	Metals
Revolutionizing Ore to Steel to Impact Emissions (ROSIE) | ARPA - E	Metals