US Department of Energy
Office of Fossil Energy and Carbon Management

Technology Commercialization Fund:
Direct Air Capture Program
Carbon Conversion Program
Critical Minerals Sustainability

NATIONAL LABORATORY CALL FOR PROPOSALS

FY 2022 Lab Call

This Lab Call is being issued by the US Department of Energy's (DOE.) Office of Fossil Energy and Carbon Management's (FECM) Office of Carbon Management and Office of Resource Sustainability in partnership with the Office of Technology Transitions (OTT)

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Contents

Lab Call Modification History

Modifications will appear here and will be distributed via email to the points of contact in Appendix C.

I. Lab Call Description

A. Background and Context

The Department of Energy Technology Commercialization Fund (TCF) was established by Congress through the Energy Policy Act of 2005 (EPAct 2005)[1] and reauthorized by the recent Energy Act of 2020 (EA 2020) to "promote promising energy technologies for commercial purposes."[2] The DOE Technology Commercialization Fund is a primary component of DOE's ongoing effort to commercialize the cutting-edge technologies in which DOE invests. These technologies, developed with taxpayer funding, comprise a portfolio of energy and enabling technologies that have the potential to improve the lives of Americans and solve many of our country's most pressing energy and environmental challenges.[3]

While DOE has always incorporated commercialization and technology transfer into its mission, in EPAct 2005, Congress explicitly authorized the TCF as a 0.9% set-aside of applied research, development, and demonstration (RD&D) funding specifically dedicated to pursuing the commercialization of DOE technologies.[4] In line with those principles, FECM is issuing this Lab Call for the Fiscal Year 2022 (FY 2022) funding.

As part of DOE's FY22 TCF portfolio, the Carbon Dioxide Removal (CDR), Carbon Conversion (CC), and the Minerals Sustainability divisions of FECM are proposing a joint solicitation focused on mineralizing solid alkaline mining waste via direct-air-captured (DAC) carbon dioxide (CO_2). The main objective is to use CO_2 sourced from DAC technologies for ex-situ accelerated carbonation of solid alkaline mining wastes to produce feedstocks for durable construction (building) materials. We seek to advance the maturation of the systems and processes involved such that pilot scale demonstrations can be realized at the completion, or soon after, of the TCF funded projects, with the ultimate goal of promoting the commercialization of these technologies.

As of 2021, the concentration of atmospheric CO_2 is 414.7 parts per million (ppm), a significant increase from pre-industrial era levels (277 ppm).[5] This current high concentration of CO_2 in the atmosphere from anthropogenic emissions is generally associated with the rise in global temperatures, leading to adverse climate change. To reduce the effects of climate change, the Department of Energy strives to achieve economy-wide net zero emissions by 2050 and concurrently remove the legacy CO_2 emissions in the atmosphere. Herein, proposals that leverage CO_2 captured directly from the atmosphere as a source for mineral carbonation of solid alkaline mining waste are requested. The tandem technologies of DAC-sourced CO_2 and mineralization processes will lead to feedstocks for value-added products. Value-added

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[1] Energy Policy Act of 2005, Public Law 109–58, 109th Cong. (August 8, 2005), *Improved technology transfer of energy technologies,* codified at 42 U.S.C. § 16391 (a).
[2] 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.
[3] DOE Office of Technology Transitions, "Mission." https://www.energy.gov/technologytransitions/mission-0.
[4] Energy Policy Act of 2005, Public Law 109–58, 109th Cong. (August 8, 2005), *Improved technology transfer of energy technologies*, codified at 42 U.S.C. § 16391
[5] Friedlingstein, P., et. al. Global Carbon Budget 2021, Earth Syst. Sci. Data Discuss. [preprint], https://doi.org/10.5194/essd-2021-386, in review, 2021.

products now allow for product marketability instead of waste disposal. Should these products be shown to be of value, this effort lays also the groundwork for a domestic supply chain for these materials.

Traditionally, acidic or neutral materials show low carbonation rates that limit the direct mineralization of atmospheric CO_2 via magnesium and calcium-bearing natural ores to form beneficial carbonate minerals. In contrast, alkaline solid wastes, especially with appropriate processing or engineered conditions, are relatively more reactive and can leverage intrinsic alkalinity (high pH) for direct CO_2 mineralization by accelerated carbonation.

The mining industry's stockpiles of solid alkaline waste exist in mine tailings, topsoil overburden, and other byproducts from mineral extraction. These stockpiles provide a potential sink for CO_2 and a mechanism to address expensive and hazardous mining wastes. For example, 419 million tons per year of mine tailings produced by the mining industries could sequester 175 million tons of CO_2 ($MtCO_2$) per year if complete carbonation of those tailings occurs.[6] In addition, reports show that of the 310 $MtCO_2$ reduced annually by direct mineralization, mining waste accounts for only 13.5 % of the total.[7] Direct mineralization of atmospheric CO_2 using solid alkaline mining wastes would be an efficient and effective way to mitigate mining waste while reducing and utilizing atmospheric CO_2. The carbonated solid wastes from this CO_2 mineralization process could be used as raw materials to produce construction materials such as binders and aggregates in concrete.

Emerging CDR technologies that aim to remove CO_2 directly from the atmosphere and permanently store it in durable products are gaining interest and investments on a global scale. Spurred on by policy changes, the economic case is building to valorize solid alkaline mining wastes as untapped carbon sinks. Most research on ex-situ CO_2 mineralization has concentrated on laboratory-scale work focusing on the chemical kinetics of carbonation or the activation/separation of alkaline sources, such as CaO or MgO. This TCF solicitation, in part, is for proposals to accelerate carbonation reaction rates as a stage of technology development on the path to improved energy efficiency, scalability, and integration into existing supply chains and infrastructure. The proposal should state the feasibility of the commercial deployment and adoption of the proposed CDR technologies (i.e., DAC and mineralization) to reduce carbon emissions and economically generate raw materials for valuable products. Projects should leverage solid alkaline waste to produce a solid, stabilized material with comparative characteristics of commercial materials and feedstocks, including aggregates for concrete, the replacement for virgin calcium carbonate in cement kilns, or other commercial applications to be identified in the proposal.

B. Timeline and Process logistics

Timeline

Activity	Date	Notes
Solicitation Released	3/29/2022	
Letter of Intent (LOI) Submission Deadline	4/26/2022	Applicants have four weeks between the solicitation issuance and the deadline for letter of intent (LOI) submission.

[6] Mining CO2 – Is Mining Atmospheric Carbon the Future of Environmental Sustainability? | Geology for Investors

[7] Pan, SY., Chen, YH., Fan, LS. *et al.* CO_2 mineralization and utilization by alkaline solid wastes for potential carbon reduction. *Nat Sustain* **3,** 399–405 (2020)

Activity	Date	Notes
Application Submission Deadline	6/3/2022	LOI decisions will be issued during the first week of May, allowing applicants one month to prepare full submissions.
Application Review & Selections Process Complete	7/15/2022	DOE will spend six weeks reviewing, collating, and ranking applications. Applicants will be notified of results shortly after this date.
Announce Award Selections & Negotiations Complete	8/16/2022	During the previous month, award negotiations will be completed, resulting in final selection announcements in mid-August.
Awards Complete and Funds Obligated	8/31/2022	The end of the 2022 fiscal year requires the obligation of funds one month prior.

Process Logistics

All communication to FECM regarding this lab call must use **FECM-TCF@hq.doe.gov.**

- **PROPOSAL SUBMISSIONS:** To apply to this Lab Call, lab personnel must send their letter of intent and full application materials to **FECM-TCF@hq.doe.gov.** All applications must be submitted to DOE from each lab's respective Office of Research and Technology Application (ORTA)[8] Technology Transfer Offices. Applications received from offices other than a lab's ORTA will be rejected. Applicants are responsible for meeting the submission deadlines. DOE strongly encourages all applicants to submit the required information at least 24 hours before the submission deadline. Applications should not wait until the last minute---internet and data server traffic can be heavy in the last hours before the submission deadline, affecting the applicant's ability to submit the required information before the deadline successfully.
- **QUESTIONS DURING OPEN LAB CALL PERIOD:** Specific questions about this Lab Call should be submitted via email to **FECM-TCF@hq.doe.gov.** FECM will provide answers related to this Lab Call at **https://www.energy.gov/fecm/fy-2022-fecm-technology-commercialization-fund.** Answers to frequently asked questions (FAQs) for this lab call can be found at **https://www.energy.gov/fecm/fy-2022-fecm-technology-commercialization-fund**. Applicants must first select the specific lab call number to view announcement-specific questions. FECM 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. DOE expects applicants to review the FAQs before submitting a question to this lab call. Questions related to the registration process and website use should be submitted to **FECM-TCF@hq.doe.gov.** Please include the lab call title and number in the subject line. Please do not ask individual FECM staff questions directly to ensure fairness for all lab participants. For processing, any questions directed to individual DOE staff will be forwarded to **FECM-TCF@hq.doe.gov.**

NOTIFICATION OF SELECTION: When selections are finalized, lab leads will receive an email from **FECM-TCF@hq.doe.gov**.

C. Key Considerations and Requirements

[8] 15 U.S.C § 3710

- **Available Funding:** Approximately $ **10 million** in funding is available to fund all projects solicited in this Lab Call pending appropriations, program direction, and go/no-go decision points.

Estimated DOE Funding Available: $10 million

Program	Funding Range (Millions)
Office of Fossil Energy and Carbon Management (FECM) (FY21 funds)	$2.5
Office of Fossil Energy and Carbon Management (FECM) (FY22 funds)	
Direct Air Capture Program	$3.7
Carbon Conversion Program	$3.5
Critical Minerals Sustainability Division	$0.3

Applications: Applications can be $3 to $5 million of DOE cost share, matched by 50% cost share from industry partners.

Estimated Number of Projects: 2-3

Estimated Project Duration: 2-3 years. Proposals must be broken into at least two budget periods of 12-18 months each, with a logical go/no-go decision point between the budget periods.

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. The full application should also describe the multi-lab collaboration and how it will work. Single-lab solutions are of interest; however, to be selected for larger funding amounts, it is suggested that labs should collaborate, and the proposed solutions must be applicable across the collaboration.

SIZE, SCOPE, AND NUMBER OF SELECTIONS: 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 availability of congressionally appropriated funds in DOE programs participating in this lab call.

COST SHARE: This lab call is subject to Section 988(b)(3) of the Energy Policy Act of 2005 regarding cost share.

CRADAS AND FOA AWARDS: The call for proposals below should **NOT** be construed as requiring the renegotiation of an existing Cooperative Research and Development Agreement (CRADA) or previously competed for FOA award in which the lab is prime or sub-recipient. Labs with CRADAs or FOA awards addressing the topic area below may incorporate that work in proposals they submit in response to the Lab Call to demonstrate existing capability and leverage existing partnerships with industry and other partners. If the proposal is not selected for funding under this Lab Call, the work under the CRADA or FOA award will continue—there is no additional risk to the provision of DOE funding.

ELIGIBILITY: Applicants should pay close attention to the eligibility restrictions listed in the topic. Proposals that involve more than one laboratory are also allowed.

DIVERSITY, EQUITY, and INCLUSION: It is the policy of the Biden Administration that

> *"The Federal Government should pursue a comprehensive approach to advancing equity[9] for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. Affirmatively advancing equity, civil rights, racial justice, and equal opportunity is the responsibility of the whole of our Government. Because advancing equity requires a systematic approach to embedding fairness in decision-making processes, executive departments and agencies (agencies) must recognize and work to redress inequities in their policies and programs that serve as barriers to equal opportunity.*
>
> *By advancing equity across the Federal Government, we can create opportunities for the improvement of communities that have been historically underserved, which benefits everyone.[10]"*
>
> *As part of this whole of government approach, this Lab Call seeks to encourage the participation of underserved communities[11] and underrepresented groups. Applicants are highly encouraged to include individuals from groups historically underrepresented[12,13] in STEM on their project teams. As part of the application, applicants are required to describe how diversity, equity, and inclusion objectives will be incorporated in the project. Specifically, applicants are required to reference, if available, the existing laboratory Diversity, Equity, and Inclusion Plan and describe within the technical volume the actions the applicant will take to foster a welcoming and inclusive*

[9] The term "equity" means the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment, such as Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality.

[10] Executive Order 13985, "Advancing Racial Equity and Support for Underserved Communities Through the Federal Government" (Jan. 20, 2021).

[11] The term "underserved communities" refers to populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life, as exemplified by the list of in the definition of "equity." E.O. 13985. For purposes of this lab call, as applicable to geographic communities, applicants can refer to economically distressed communities identified by the Internal Revenue Service as Qualified Opportunity Zones; communities identified as disadvantaged or underserved communities by their respective states; communities identified on the Index of Deep Disadvantage referenced at https://news.umich.edu/new-index-ranks-americas-100-most-disadvantaged-communities/; and communities that otherwise meet the definition of "underserved communities" stated above.

[12] According to the National Science Foundation's 2019 report titled, "Women, Minorities and Persons with Disabilities in Science and Engineering", women, persons with disabilities, and underrepresented minority groups—blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives—are vastly underrepresented in the STEM (science, technology, engineering and math) fields that drive the energy sector. That is, their representation in STEM education and STEM employment is smaller than their representation in the U.S. population. https://ncses.nsf.gov/pubs/nsf19304/digest/about-this-report For example, in the U.S., Hispanics, African Americans and American Indians or Alaska Natives make up 24 percent of the overall workforce, yet only account for 9 percent of the country's science and engineering workforce. DOE seeks to inspire underrepresented Americans to pursue careers in energy and support their advancement into leadership positions. https://www.energy.gov/articles/introducing-minorities-energy-initiative

[13] See also. Note that Congress recognized in section 305 of the American Innovation and Competitiveness Act of 2017, Public Law 114-329:

environment, support people from underrepresented groups in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project; and the extent the project activities will be located in or benefit underserved communities. The proposed project should include at least one SMART (Specific, Measurable, Assignable, Realistic and Time-Related) milestone per budget period supported by DEI relevant metrics to measure the success of the proposed actions. Please refer to Section III.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 innovation, this implementation strategy for the proposed project will be evaluated as part of the application review process.

Further, to the extent the proposed project will include external partners, the applicant is encouraged to include Minority Serving Institutions[14], Minority Business Enterprises, Minority Owned Businesses, Woman Owned Businesses, Veteran Owned Businesses, or entities located in an underserved community. BTO may consider the inclusion of these types of entities as part of the selection decision.

II. Topic Area Descriptions

The DOE program offices and laboratory stakeholders contributing to this lab call have identified persistent barriers and known gaps to the commercialization of laboratory technologies and developed specific topics aimed at addressing them. The intent of the topic below is to address core challenges, barriers, and gaps impeding DOE National Laboratory technology commercialization as well as their root causes (inside and outsideof the labs).

All proposals must include how the team will track and show their respective commercialization impact and outcomes from the proposed program(s). Please refer to Section III.B. on Impact Tracking to ensure these metrics and tracking requirementsare built into any proposals.

DOE highly encourages labs to partner with external organizations and private companies, as such partners may have deep knowledge and experience performing many of the activities described in the topics, some may have already built needed components under many of the topic areas below, and some may help advance DOE's DEI goals.

Topic: Mineralization of mining wastes through Direct Air Capture (DAC)-sourced CO_2 into durable products

DOE research development, demonstration, and deployment (RDD&D) investments in National Laboratories generate much intellectual property (IP). However, the degree to which this IP is aligned to the specific

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

market and industry needs are inconsistent and, at times, unknown. For DOE energy technologies to reach their full potential and impact, they need to be developed with a clear understanding of their utility and potential impact on the industry.

This topic seeks proposals from labs and partner organizations to develop and design an integrated system that combines either a passive or active DAC technology with the mineralization of solid alkaline mining waste into carbonated material. This joint solicitation focuses on mineralization of solid alkaline mining waste via DAC sourced CO_2 to produce feedstocks for durable materials. DAC requires removing CO_2 directly from the atmosphere where a significant amount of air flow contacts a functional surface that has high affinity and selectivity towards CO_2; thus, enabling a high rate of CO_2 capture leading to a concentrated stream, which is then utilized for mineralizing mining wastes. The mining industry's stockpiles of solid alkaline waste exist in mine tailings, topsoil overburden, and other byproducts from mineral extraction. These stockpiles provide a potential sink for CO_2 and a reliable method to address expensive and hazardous mining wastes.

This TCF solicitation, in part, is for proposals to accelerate carbonation reaction rates while demonstrating a path to improved energy efficiency, scalability, and integration into existing supply chains and infrastructure. This TCF encourages participants to explore either a passive DAC technology approach that filters CO_2 directly from ambient air or an active DAC technology implementation using mechanical energy to force air across a CO_2 selective media. All of the proposed technology solutions would represent a DAC approach that would utilize captured CO_2 for accelerated carbonation of solid alkaline mining wastes to produce feedstocks for durable materials.

Proposals must validate durable carbon storage, characterize the physical and chemical properties of carbonated raw material(s), and elucidate an appropriate construction end-use, using market qualifications and metrics (i.e., grain size, purity, density, etc.). Proposals that screen many solid alkaline mining wastes and assess applicable end uses for the carbonated raw materials are preferred. Proposals must also address the scale and accessibility to targeted feedstocks and any necessary materials handling infrastructure, highlighting how the proposed system could integrate into existing facilities. An environmental health and safety analysis plan should be developed to address the technology's effect on the environment, safety, and human health.

An important aspect of this TCF solicitation is the requirement for validation of durable carbon storage via direct utilization of CO_2 for accelerated carbonation of solid alkaline mining wastes to produce feedstocks for durable materials. Carbon conversion/utilization technologies are seen as an alternative end-use for captured CO_2 to EOR or saline storage. Direct utilization of CO_2 can often be implemented using existing infrastructure and available source materials such as solid alkaline mining wastes for the production of feedstock. This is important since carbon storage using EOR or saline aquafers may not be readily available in all regions of the U.S., thus leaving carbon utilization as the primary alternative for handling DAC sourced CO_2.

The Minerals Sustainability Division prioritizes the characterization of unconventional and secondary sources of critical minerals from fossil energy-related byproducts and related resources. A critical mineral is defined as a (i) a non-fuel mineral or mineral material essential to the economic and national security of the United States, (ii) the supply chain of which is vulnerable to disruption, and (iii) that serves an essential function in the manufacturing of a product, the absence of which would have significant

consequences for our economy or our national security",[15,16] and other materials, such as solid alkaline waste and historical mining waste. The United States Geologic Survey's (USGS) Mineral Resources Data System (MRDS) contains more than 60,000 former metal mines sites across the US with associated mine waste that holds a wealth of rare earth elements and other critical minerals. Proposed projects should capitalize on mining waste feedstocks, such as mine tailings, slag, and/or other deleterious material, from which critical minerals can be extracted and separated. In addition, the proposed projects should be compatible with critical mineral extraction and separation systems, such as physical beneficiation, chemical separation, including, but not limited to, hydrometallurgy or solvent extraction for the separation REE-CM oxides.

The CO_2 Removal and Conversion (CDR) division is specifically interested in capturing, converting, and optimizing the carbon dioxide stored within the carbonated materials while reducing direct air capture's economic and energy costs. Highlighted topics of interest include but are not limited to the following: percent CO_2 mineralized, competitive reaction rates, process designs that integrate DAC systems, and multiple materials screening microstructural-properties relationships.

Ideal proposals will integrate market pull into new R&D development, thinking, and program strategy, forming a conduit of market insight and awareness. Outcomes of proposed projects could inform DOE and lab policies and programs that accelerate the commercial adoption of critical technologies. This integration of strategic priorities and market understanding would strengthen the DOE and National Lab Complex's ability to support market needed innovation.

Scalability and adaptability should be clear considerations for proposals, as the innovation ecosystem is expected to continue to expand and evolve rapidly over the coming decades.

III. Application Submission and Review Information

A. Process and Submission details

Applications

Proposals must be submitted electronically by the **submission deadline of 6/3/2022 at 11:59 PM Eastern**.

All communication to FECM regarding this lab call must use **FECM-TCF@hq.doe.gov.**

To apply to this Lab Call, applicants must send their letter of intent and full application materials electronically to **FECM-TCF@hq.doe.gov.**

All submissions must conform to the guidelines for format and length and be submitted at, or prior to, the deadline listed.

[15] Federal Register :: A Federal Strategy To Ensure Secure and Reliable Supplies of Critical Minerals EO 13817
[16] See the 2022 USGS list of critical minerals https://www.federalregister.gov/documents/2022/02/24/2022-04027/2022-final-list-of-critical-minerals

All applicants must submit LOIs and full applications with their DOE lab email only. Non-lab email addresses will not be accepted.

Proposals

Applicants must include all content they wish to have reviewed in the proposal. Applicants are required to submit 1-page resumes for key participating team members (multi-page resumes are not allowed), as well as letters of commitment from all subrecipient and third-party cost share providers. If applicable, include any letters of commitment from partners/end users (1-page maximum per letter). Resumes, commitment letters, and references should be included in the application as an appendix, which will not count towards the 25-page limit. Additional pages beyond that will not be reviewed.

- FECM will not review or consider ineligible applications.
- Individual proposals must be submitted in PDF format as a single file (do not bundle multiple proposals in a single file).

Process

- **ELIGIBILITY:** Only DOE National Laboratories are eligible for funding from this lab call. All applications must be submitted to DOE from each lab's respective Office of Research and Technology Application (ORTA)[17] Technology Transfer Offices. Applications received from offices other than a lab's ORTA will be rejected. All other National Laboratory offices and programs must coordinate with their respective TTOs to submit applications. Proposals that involve more than one laboratory are highly encouraged.

  A full application must be submitted per the guidelines below to be eligible to apply to this call.

  - Laboratories are expected to coordinate on a letter of intent (LOI) and application submission internally and with multi-lab collaborators.
  - Though there is no limit on the number of concept slides submitted, each National Laboratory ORTA TTO may submit **no more than two full project applications that include only single-lab participation, whereas each National Laboratory ORTA TTO can submit an unlimited number of full project applications that include more than one lab partner.** Any submitted applications that exceed this threshold will not be considered. Applications will be counted in the order in which they are received.

- **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.

[17] 15 U.S.C § 3710.

- **SUBMISSION:** To apply to this lab call, ORTA TTO personnel must submit application materials to **FECM-TCF@hq.doe.gov.** Only ORTA TTO personnel can submit applications under this lab call.

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

- **Letter of Intent:** Submission of a letter of intent (LOI) by April 26th, 2022 is required. As in the recent past, applicant LOIs will be collected and reviewed before full applications are submitted. The LOI stage is designed to help applicants determine if their proposals align with the technical mission and objectives of the solicitation. LOIs should be no more than two pages and contain a summary of the proposed scope of work and objectives. The letters will be reviewed internally by a FECM technical manager and a commercialization expert from the Office of Technology Transitions (OTT). This review will be conducted quickly, and the results will be communicated directly to the applicants.

  Two ratings will be issued: a responsive application will receive an "encourage" rating. This means that the submission appears to align with the objectives of the solicitation, and the applicant is encouraged to submit a full application. A "discourage" rating will signify the proposal does not adhere to the solicitation's core objectives, and the applicant is advised not to proceed further, as the odds of an award are slim. LOI decisions are non-binding so that applications will be accepted regardless of the LOI rating. This stage is designed to assist the applicant before the work begins in earnest on the full proposal, and so all applicants are strongly encouraged to submit an LOI.

  For fairness, LOI ratings will be communicated to all potential applicants on the same day. Applicants will then have several weeks to prepare full application packages. The criteria for a successful application are listed below in this announcement's "Application and Review" section. While the Department used external independent reviewers in the past, changes in the TCF administration have caused technical and commercial reviews to be conducted internally by FECM and OTT staff.

- **FULL APPLICATIONS:** Labs are encouraged to further expand their concept into a full application, building on the feedback from the letter of intent. Full applications are required to be eligible for award(s) under this solicitation. Application materials must be submitted to **FECM-TCF@hq.doe.gov.**

  DOE will not review or consider ineligible full applications. Unrelated concepts shall not be consolidated in a single full application. Full applications must conform to the requirements below.

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

B. Full Application Requirements

Specific Proposal Requirements

- Applications must source actual alkaline solid wastes materials from mining industries; synthetic or representative alkaline solid waste will be considered non-responsive.
- Proposals must produce sufficient materials to complete end-use specific testing, i.e., accelerated stress tests, material characterizations, and purity levels of the final product.
- Applicants should detail their testing conditions, i.e., time of the campaign, degree of integration, discuss the relevancy of test conditions to real-world conditions, replicate testing/campaigns, and others.
- Applications must discuss the planned environmental, safety, and health analysis for products proposed to be manufactured, identifying, and addressing the technology's effect on the environment, safety, and human health.
- Applications must include an analysis of the proposed market viability of this technology and identify market barriers/risks associated with its deployment and any potential mitigation strategies.

Preliminary life cycle analysis (LCA) must be employed as an initial step for quantifying CO_2 removal; a final LCA report using NETL's tool kit for the CO_2-based products will be required at the end of the project (https://www.netl.doe.gov/LCA/CO2U). Applicants are encouraged to reference the NETL methodology for guidance when developing their preliminary LCA. The proposed system boundary should consist of the upstream unit flows for alkalinity sources and DAC systems. The comparative counterfactual system can be multifaceted to include the discrete product systems of commercial mining products and conventional building material products.

General Proposal Requirements

Proposals 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 a 10-point font (Times New Roman preferred).

Documents must conform to this naming convention: "2022 TCF' Name of File' [TrackingID #].pdf." If applicants exceed the maximum page lengths indicated below, DOE will review only the authorized number of pages and disregard any additional pages.

The proposal length shall not exceed 25 pages for all Lab Call topics. Only the first 25 pages of content will be reviewed if a package exceeds that length. In regards to content to be reviewed, references to other journal articles and information will not be reviewed: thus, all pertinent information must be included in the proposal. Approved appendices do not count towards the above-noted page limits. Refer to the "Proposals" section below for details. Proposals 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(s) and subtopic(s) being applied for, PI (s) and business points of contact, names of all team member organizations, any statements regarding confidentiality, a nonproprietary project summary, and a 200-or-less-word summary of the project suitable for public release if the project is funded.
    - Include the lead applicant's name, address, phone number, and email address (organization) for contract issues and

project issues.

- DOE encourages multi-lab teams to address the topic in an interwoven, holistic approach. The proposal will be reviewed and evaluated under all respective aspects indicated.

1.0 Summary: The summary provided should be one page in length and should provide a truncated explanation of the proposed project; a clearly defined, easily communicated, end-of-project goal; and a high-level overview of the estimated project budget, listing an estimated breakdown for each proposed year, separated by teaming partners. 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.

2.0 Project Description: Describe the project in enough detail to evaluate its innovation, impact, and relevance to the topic objectives. Describe relevant background information that helps demonstrate the need for this project, including the problem statement or major challenges and barriers being overcome through the project, how the proposed project supports one or more of the lab call objectives, the approach to solving the problem, and why this funding is needed to enable this work. For multi-lab projects, a description of each performer's role and responsibility and how individual efforts will be coordinated to achieve the overall project goal should also be included. The applicant should clearly specify the project's expected outcome(s). The applicant should describe the specific innovation of the proposed project, the advantages over current and emerging programs and/or processes, and the overall impact on advancing the baseline if the project is successful.

- Additionally, indicate whether the project is related to other current or recently completed DOE-funded or lab-funded projects. If appropriate, identify any next-stage commercialization, intellectual property, or resource factors.

3.0 Diversity, Equity, and Inclusion: As part of the application, applicants must describe how diversity, equity, and inclusion objectives will be incorporated into the project. Specifically, applicants are required to submit a description of how the project will support or implement the lab-wide Diversity, Equity, and Inclusion Plan and describe the actions the applicant will take to foster a welcoming and inclusive environment, support people from groups underrepresented in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project; and the extent the project activities will be located in or benefit underserved communities. The plan should include SMART milestones supported by metrics to measure the success of the proposed actions. The DEI section should contain the following information:

a. Equity Impacts: the impacts of the proposed project on underserved communities, including social and environmental impacts;

b. Benefits: The anticipated overall benefits of the proposed project, if funded, to underserved communities; and

c. How DEI objectives will be incorporated into the project.

The following is a non-exhaustive list of actions that can serve as examples of ways the proposed project could incorporate diversity, equity, and inclusion elements. These examples should not be considered either comprehensive or prescriptive. Applicants are encouraged to propose appropriate actions not covered by these examples.

a. Diversity on the research team
    i. Include persons from groups underrepresented in STEM as PI, co-PI, and/or other senior personnel;
    ii. Include persons from groups underrepresented in STEM as student researchers or post-doctoral researchers;
    iii. Implement evidence-based, diversity-focused education programs (such as implicit bias training for staff) in your organization;
    iv. Identify Minority Business Enterprises, Minority-Owned Businesses, Woman-Owned Businesses, and Veteran Owned Businesses to solicit as vendors and sub-contractors for bids on supplies, services, and equipment;
    v. Include faculty or students from Minority Serving Institutions as P.I./co-PI, senior personnel, and/or student researchers;
    vi. Enhance or collaborate with existing diversity programs at your home organization and/or nearby organizations; and
    vii. Collaborate with students, researchers, and staff in Minority Serving Institutions.
b. Explicit diversity in research impact
    i. Illustrated outcome impact in underserved communities; and
    ii. Disseminate research and development results in Minority-Serving Institutions or other appropriate institutions serving underserved communities.
c. Explicit diversity in research design. Inclusion of a broad community, academic, policymaking staff in research design and execution phase.

These examples should not be considered either comprehensive or prescriptive. Applicants may include appropriate actions not covered by these examples.

4.0 Potential Commercialization Advances: Identify root causes (inside and outside of the labs) of the existing lab commercialization challenges and barriers that, if addressed, will result in significant advances for commercializing technologies. Describe a reasonable path for the proposed project toward commercialization successes, including the anticipated timeline for market entry or increased market adoption for related technologies involved in the proposed program(s).

5.0 Work Plan: This section lists the key tasks and provides brief descriptions for each task, including the 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 minimize those risks.

6.0 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, and if funded, the proposed project would measure success during and

after the funded period. Awardees must report every year over 5 years, including the up-to-3-year award period and any relevant 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.

Specific targets for identified metrics should be provided, as appropriate. When identifying metrics, applicants should consider short-, medium-, and long-term goals. Sample metrics are shown below and should be tailored to the nature of the submitted proposal.

- Acceptable metrics include but are not limited to: 1) number of CRADAs or other partnering arrangements that come out of the labs, 2) increase in the number of licensed lab technologies, 3) number of tangible improvements to lab-related activities based on customer discovery, 4) qualitative data before and after activity measuring understanding or perspective shift, 5) number of lab technology transfer professionals trained in areas outside of normal activities, 6) private funds invested in solutions, 7) number and value of established industry/incubator partnerships, 8) number of inquiries for new partnerships, 9) innovation/IP generation, 10) annual revenue from commercialized technologies, and 11) others.
- 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 the project, and 5) other subjective, vague, and/or ambiguous metrics.

7.0 Team and Required Resources: Describe the expected DOE and National Laboratory member resources, including proposed work areas, staff time, and any facility/equipment needs. Include specific locations and laboratories to be used.

8.0 Proposed Base Budget and Options: Provide a minimum budget for all project expenses by each National Lab and project partner. 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 (personnel, travel, equipment, supplies, contractual, indirect, etc.). Other funding sources, including cost-share information, shall be provided here, if applicable.

Additionally, the recommended budget should provide enough information to create a menu of task/budget options to increase the recommended budget and project scope and decrease the budget and project scope. Additional budget recommendations must reference and link to related activity scope of what would be additional and beyond what is proposed in the minimum budget or what would be removed from the minimum budget. The intent for these options in the recommended budget is to allow

DOE the most flexibility in funding the project and optional elements that could improve the proposed project's success.

During the evaluation process, DOE reserves the right to determine an award with changed project scope and budget. Having these details and applicant-provided options to reduce or increase project scope and/or budget allows DOE to make more informed and collaborative decisions.

10.0 References: References are not counted in the 25-page limit and should be included in the application as an appendix.

11.0 Team Resumes: Include single-page resumes of key project participants. These are not counted in the 25-page limit and should be included in the application as an appendix.

12.0 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 (not counted in the 25-page limit). 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 award. The document must conform to this naming convention: "2022 TCF Public Summary [Tracking ID #].ppt." 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, if applicable.

C. 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 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 to be 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 against 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 a financial assistance or loan agreement between the submitter and the government. The government may use or disclose any information not appropriately marked or otherwise restricted, regardless of source. [End of Notice]"

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 above-referenced markings enable DOE to follow the provisions of 10 CFR 1004.11(d) if a Freedom of Information Act (FOIA) request is received for information submitted with a proposal. Failure to comply with these marking requirements may disclose the unmarked information under a FOIA request or otherwise. The US government is not liable for disclosing or using unmarked information and may use or disclose such information for any purpose.

Subject to the specific FOIA exemptions identified in 5 USC 552(b), all information submitted to FECM by an applicant is subject to public release under the Freedom of Information Act, 5 USC §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 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 CFR §1004.11 to solicit the proposer's views on how the information should be treated.

D. Application Review and Selection

Applications will be collated, reviewed, ranked, and preliminarily selected by FECM technical managers six weeks after the submission deadline. The ranking and decision-making process is detailed below in this document. All applicants will then be notified of the proposed selections, keeping in mind that instances have occurred when initial selections have not resulted in full awards due to various circumstances. Therefore, tentative decisions will not be finalized nor announced to the general public until negotiations have been completed.

i. Merit Review and Selection Process

The 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

government's property.

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

As noted in previous sections, all full award proposals are subject to a merit review process to evaluate the technical and commercial viability of the project, a key goal of the TCF. Due to TCF administrative changes, the review process is slightly different in FY 22 compared to past years, although the basic structure is largely retained and will appear familiar to past applicants. The activities described here will occur six weeks after full applications have been submitted to FECM.

All applications will be reviewed for proficiency in the following four areas:

1. **Commercial Impact**
2. **Technology Maturity**
3. **Project Plan**
4. **Project Team and Resources**

Commercial Impact: Submitted proposals should focus primarily on commercializing the technology in concert with a private partner. Therefore, they should contain comprehensive information about the commercial impact of the technology.

There must be a clear explanation of the current or anticipated market for the technology. This should include a description of the significant market need that the project addresses. Applicants should also specify whether the proposed technology could achieve market penetration independent of complementary technologies, processes, or other requirements. If other factors, such as policy or regulations, are required for the technology to achieve market penetration, applicants should identify them and discuss the circumstances.

Technology Maturity: Proposals should address what the project intends to accomplish in advancing the technology's maturity. They should also describe which activities need to be undertaken to achieve the commercialization goals of the project. There may be a clear, concise explanation of the current state of the technology and the anticipated state of the technology at the end of the project. To the degree they can be anticipated, applicants should explain the technical challenges and unanswered technical questions that must be addressed to reach the desired maturity of the technology. There should be an explanation of any complementary technology(ies) necessary for the proposed technology to function and be relevant in the market.

Project Plan: As articulated in the technical description, the breadth of these awards necessitates a detailed, credible project plan that justifies proceeding to further work-stages based on meeting success milestones.

Project Team and Resources: There must be a clear articulation that the project team and resources are qualified and capable of completing the project. This includes both the facility and partner teams. Proposals must clearly define team members' roles and responsibilities. There should be evidence

that the necessary personnel, facilities, and equipment are available and committed to the project.

Objectivity and Qualifications of the Application Reviewers: TCF Merit Reviewers will be US citizens working for the Department of Energy and will not receive nor be in discussions about receiving compensation from a foreign government entity, including country, regional, or local level foreign governments, certain foreign corporations, and foreign public universities. Compensation includes cash, research funding, honorific titles, career advancement opportunities, promised future compensation, or other types of remuneration or consideration.

Reviewers will be free from actual conflict of interest (a relationship that exists and affects impartiality) and apparent conflict of interest (a relationship that does not result in a conflict, but the nature of the relationship is such that the third party with an understanding of the facts would have cause to question the impartiality of the relationship.) All reviewers will be presented with specific criteria and agree that they are free from conflicts of interest that would bias the results of their evaluations.

Reviewers will not accept any invitations or gratuities (meals, gifts, favors, etc.) from any TCF applicant or proposal partner. If offered any invitations, gratuities, or job offers by or on behalf of any applicant, it will immediately be reported to DOE's General Counsel Office.

Confidentiality: All reviewers will agree to use any application information only to review and treat the information obtained in confidence. Further, they will not use such information for their private gain or the private gain of others. This requirement for confidential treatment applies to information obtained from any source, including the submitter, without restriction. Upon completion of their duties, the reviewers will purge any TCF files.

Classification of Reviewers: There are two kinds of TCF reviewers. Commercialization Reviewers and Technical Merit Reviewers. One commercialization Reviewer will review each proposal from OTT and two Technical Merit Reviewers within FECM.

Commercialization Reviewers (O.T.T.):

Are subject matter experts whose specialties include commercialization and tech-to-market. They will score and comment **only** on the commercialization criterion, which makes up 35% of each proposal's composite score. Each application will be assigned one such reviewer.

Technical Merit Reviewers (FECM):

Are subject matter experts in the technology area or specific technology proposed in the applications they are assigned to review. They will score and comment **only** on the technical merit criteria, comprising 65% of each proposal's composite score. Each application will be assigned two such reviewers.

Scoring: All proposals will be scored on the same review criteria.

1. Commercialization Evaluation (35% of composite score)

The Commercial Impact Criterion consists of the following components:

- The extent to which the proposed technology will result in a commercially-successful product;
- The extent to which the proposed technology can be successfully commercialized in a reasonable timeframe;
- The extent to which the proposed technology represents an innovative or significant improvement from current state-of-the-art technologies that result in either a product or solution that transforms or replaces existing industry approaches or is a new product or solution that can be widely used by the existing industry and will have a significant market impact;
- The extent to which the project team understands the market and its barriers to commercialization; and
- The extent to which the applicant identifies and discusses factors or circumstances such as policy or regulations required for the technology to achieve market penetration.

2. Technical Merit Evaluation (65% of composite score)
Three sub-criteria comprise the Technical Merit Evaluation:

Technical Merit Criterion 1: Technology Maturity: 40% of 65%

- Technology has demonstrated analytical and experimental proof of concept in a laboratory environment. For example, experiments or modeling, and simulation have validated performance prediction of technology capability. Design techniques have been identified or developed. Scaling studies have been initiated;
- The extent to which the applicant describes an understanding of complementary technologies or processes that are necessary for the technology to have relevance in the market;
- The extent to which the applicant describes an understanding of technical issues to be addressed to achieve a successful commercial deployment; and
- Evidence that the technology can be deployed at scale.

Technical Merit Criterion 2: Project Plan: 40% of 65%

Technical and Commercialization Approach:

- Quality and reasonableness of the applicant's plan for closing technical gaps and addressing unanswered technical questions; and
- Quality and reasonableness of the applicant's business plan for market penetration/adoption.

Risk Management:

- The extent to which the applicant discusses and demonstrates an understanding of the key technical and commercial uncertainty and risks involved in the proposed work; and
- The extent to which the applicant adequately describes how the applicant's team will manage and retire risks.

Goals and Outcomes:

- The extent to which the project plan clearly describes the goals and outcomes of the project, including measures of technical advancement and business success; and
- The extent to which the work plan's proposed tasks and subtask activities are verified through performance metrics, milestones, and deliverables that are specific, measurable, aggressive (but attainable), realistic, and timely (i.e., not a report summarizing work that was done).

Technical Merit Criterion 3: Project Team and Resources: 20% of 65%

- Capabilities: The extent to which the capability of the Principal Investigator(s) and the proposed team, including partnerships, can address all aspects of the proposed project, including, but not limited to, qualifications, relevant expertise, and time commitment of the individuals on the team;
- Contributions: Clarity, adequacy, and completeness of roles and contributions of each team member in the development of the project and/or commercialization of the products, including financial support of partners;
- Readiness: Extent to which the final team, facilities, and equipment required to complete this project are fully in place, assembled, and committed to the project (e.g., there are no key members that are "to be hired at a later date"?);
- Commitment: Extent to which there is demonstrated institutional commitment from senior DOE Facility management and corporate officers of partners; and
- Resources: Sufficiency of facilities to support the proposed work and reasonableness and adequacy of the proposed budget to meet proposed project objectives.

Scoring depends on the relative degree to which the strengths outweigh the weaknesses or the weaknesses outweigh the strengths. The Commercialization Reviewer will assign one score. Each of the two Technical Merit Reviewers will assign three sub-scores appropriately weighted as outlined above. The weighted aggregate will then be averaged to constitute 65 % of the overall score, with a final weighting of the commercialization review resulting in the overall score. Before weighting and averaging, all sub-scores will be given a scale of 0 to 10:

- Scores of 8-10 indicate that the proposal strongly addresses all aspects of the criterion or the criteria;
- Scores of 5-7 indicate that the proposal address criterion or addresses all of the criteria but has some shortcomings;
- Scores of 2-4 indicate a proposal that lacks development and does not meet all aspects of the criterion or criteria; and
- Scores of 0-1 indicate that a proposal does not meet any of the aspects of the criterion or criteria and needs additional development.

Along with numerical sub-scores, each reviewer will also have a comment box to describe his or her evaluations of proposal strengths and weaknesses. After the final rankings are completed, FECM will share the reviewer comments with the applicants. Due to resource constraints, reviewer responses from the applicants will no longer be collected or considered.

Strengths are aspects of the proposal that, when compared to the evaluation criterion, provide evidence

that an applicant can perform the criterion successfully.

- Minor Strength: An applicant is likely to fulfill the criterion;
- Significant Strength: Virtually no doubt about an applicant's capability to fulfill the criterion; and
- Several strengths within a criterion may be considered significant.

Weaknesses are aspects of the proposal that, when compared to the evaluation criterion, provide evidence an applicant may not be capable of fulfilling the criterion successfully.

- Minor Weakness: Raises doubts regarding the ability of an applicant to satisfy the criterion but is easily correctable.
- Significant Weakness: No doubt regarding an applicant's lack of capability to perform, and cannot be corrected without a major revision to the proposal
- Several weaknesses within a criterion may be considered significant

After all weighting and averaging are completed, the final score of each proposal will lie between 0 and 10. The rankings will be collated and provided to the TCF technical managers, the final decision-makers for those meritorious projects eligible for funding. As in past years, if there is a strong case for a lower-ranked proposal to be funded instead of a more highly ranked one, the technical manager can utilize this authority, but the action must be justified through a written comment. FECM hopes that the LOI stage will minimize this practice by only encouraging full applications that are well-suited to the technical objectives. Suppose the aggregate scores of several applications are highly similar. In that case, a highly relevant project may be selected even though it is ranked lower as both the final ranking and the respective score values will be considered by the selecting technical officials.

ii. Selection for Award 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, subject to the availability of funds and other factors. OTT will notify applicants if they are, or are not, selected for award negotiation.

DOE will only select proposed projects that support the statutory requirement of the TCF to "promote promising energy technologies for commercial purposes."

Type of Award Instrument: TCF awards will be documented and funded through the existing work authorization and funds management processes of the DOE program office(s) providing the funding. DOE facilities will be required to track federal funds following normal departmental procedures. DOE facilities will also be required to track nonfederal funds following 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 M&O contracts.

iii. Selection Notification

DOE anticipates completing the selection and negotiation process by Q4 FY22 (subject to change). DOE will notify lab leads electronically of selection results. All of DOE's decisions are final when communicated to applicants.

E. Project Administration and reporting

The DOE facilities manage projects selected for an award in accordance with their requisite policies and procedures. FECM will provide all required project oversight and engagement with TCF project recipients; DOE program offices participating in this lab call are also encouraged to engage.

TCF project recipients will be required to meet quarterly with FECM to discuss project progress and provide quarterly progress reporting, annual metrics reporting for the entire 5-year period, and a final report at the end of the project.

F. Questions and OTT National Labs Contact

Specific questions about this lab call should be submitted via email to **FECM-TCF@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, FECM will post all questions and answers on **https://www.energy.gov/fecm/fy-2022-fecm-technology-commercialization-fund.**

Because only National Laboratory TTO staff are eligible to apply and are responsible for coordinating inter-lab, across labs, and external partners, a list of lab TTO points of contact is provided in Appendix C.

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

COST-SHARE

This lab call is subject to Section 988(b)(3) of the Energy Policy Act of 2005 regarding cost share.

Cost-share funds are subject to audit by the department or other authorized government entities (e.g., GAO). A written agreement may be advisable between the DOE facility and the third party or between the CRADA 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 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 statutorily required 50% of total project costs from nonfederal sources.

OTT has no policy regarding foreign expenditures. 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 above, other factors may also come into play, such as the timing of in-kind contributions and the length of the project period. For example, the value of 10 years of donated maintenance on a project with a project period of 5 years would not be fully allowable. Only the value for the 5 years of donated maintenance corresponding to the project period is allowable and may be counted.

Additionally, DOE will not allow pre-award costs.

As stated above, the rules about what is allowable are generally the same within like types oforganizations. 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 of 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 orprogram.

    3. They are necessary and reasonable for accomplishing a project or program objectives properly and efficiently.

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 based on costs incurred. The cost principles authorize depreciation or use charges for real property or equipment used on the project. The item's full value may be applied when the item will be consumed in the performance of the award or fully depreciated by the end of the award. 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 property's fair market value.

2. Valuing services of others' employees. Suppose an employer other than the recipient furnishes the services of an employee. In that case, those services are valued at the employee's regular pay rate, 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 where the required skills are not found in the recipient organization, rates must be consistent with those paid for similar work in the labor market where 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 the land and the full value of equipment or other capital assets may be allowed when consumed in the performance of the award or fully depreciated by the end of the award, 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 employees.

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

Appendix B: Other TCF Lab Calls.

Other TCF Lab Calls		
Cybersecurity, Energy Security, and Emergency Response	Technology Area Lab Call	Q2 FY 2022
Energy Efficiency & Renewable Energy—Advanced Manufacturing Office	Technology Area Lab Call	Q2 FY 2022
Energy Efficiency & Renewable Energy—Bioenergy Technologies Office	Technology Area Lab Call	Q2 FY 2022
Energy Efficiency & Renewable Energy—Vehicle Technologies Office	Technology Area Lab Call	Q2 FY 2022
Fossil Energy and Carbon Management	Technology Area Lab Call	Q2 FY 2022

Appendix C: TCF Points of Contact at DOE National Lab TTOs

Facility	TCF Points of Contact
The Ames Laboratory	Melinda Schlosser melindas@ameslab.gov 515-294-1254 Julienne Krennrich jmkrenn@ameslab.gov 515-294-1202
Argonne National Laboratory	Hemant Bhimnathwala hbhimnathwala@anl.gov 630-252-2354 David McCallum dsm@anl.gov 630- 252-4338
Brookhaven National Laboratory	Poornima Upadhya pupadhya@bnl.gov 631-344-4711 Eric Hunt ehunt@bnl.gov 631-344-2103 Ivar Strand istrand@bnl.gov 631-344-7579
Fermi National Accelerator Laboratory	Mauricio Suarez suarez@fnal.gov 630-840-6947 Cherri J. Schmidt cherri@fnal.gov 630-840-5178
Idaho National Laboratory	Lisa Aldrich lisa.aldrich@inl.gov 208-569-0405 Jason Stolworthy jason.stolworthy@inl.gov 208-526-3437

Facility	TCF Points of Contact
Kansas City National Security Campus	Andrew Myers amyers@kcnsc.doe.gov 816-488-4432 Michele Weigand mweigand@kcnsc.doe.gov 816-488-6725
Lawrence Berkeley National Laboratory	Shanshan Li shanshanli@lbl.gov 510-486-5366 Todd Pray tpray@lbl.gov 510-486-6053 Gail Chen gailchen@lbl.gov
Lawrence Livermore National Laboratory	Elsie Quaite-Randall quaiterandal1@llnl.gov 925-423-5210 Chris Hartman hartmann6@llnl.gov
Los Alamos National Laboratory	MaryAnn D. Morgan mary_ann@lanl.gov 505-667-5324 Andrea Maestas andream@lanl.gov 505-667-1230 Jerome Garcia jgarcia@lanl.gov 505-665-9090
National Energy Technology Laboratory	Samantha Zhang samantha.zhang@netl.doe.gov Michael Nowak michael.nowak@netl.doe.gov 412-386-6020

Facility	TCF Points of Contact
National Renewable Energy Laboratory	Jennifer Fetzer jennifer.fetzer@nrel.gov 303-275-3014 Eric Payne eric.payne@nrel.gov 303-275-3166
Nevada National Security Site	Robert Koss kossrj@nv.doe.gov 702-295-1213 Matthew Pasulka pasulkmp@nv.doe.gov 702-295-2963
Oak Ridge National Laboratory	Michael J. Paulus paulusmj@ornl.gov 865-574-1051 Eugene Cochran cochraner@ornl.gov 865-576-2830
Pacific Northwest National Laboratory	Christina Lomasney christina.lomasney@pnnl.gov Allan C. Tuan allan.tuan@pnnl.gov 509-375-6866
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