U.S. Department of Energy
Office of Fossil Energy and Carbon Management
National Energy Technology Laboratory

Request for Information (RFI)
DE-FOA-0003216

Title: Growing Carbon Management Education Capacity at Minority Serving Institutions (MSI) through the Office of Fossil Energy and Carbon Management (FECM) University Training and Research (UTR) Program

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Due Date: January 5, 2024 5:00 P.M. ET

Program Area: U.S. Department of Energy (DOE), Office of Fossil Energy and Carbon Management/National Energy Technology Laboratory (NETL)

Purpose: This is a Request for Information (RFI) issued by DOE's Office of Fossil Energy and Carbon Management (FECM).

The purpose of this RFI is to seek input on various questions regarding potential funding for workforce development efforts through new curricula on carbon management informed by community knowledge and values through FECM's UTR Program.

Information on curricula components, staffing, time, recruitment and accessibility, and cost related to the following comments and questions is requested. Input is sought from universities, colleges, other leaders in education, tribal governments, philanthropies, non-profit organizations, community leaders, government agencies, labor unions and organizations, and other relevant stakeholders.

Background: For more than 30 years, the UTR Program has provided opportunities for students and principal investigators (PIs) to perform research and development (R&D) at MSIs through one of its two sub-programs: the Historically Black Colleges and Universities (HBCUs) and other MSIs (HBCU-MSI) program. The program's mission objectives are to:

1. Educate and train the next generation of engineers and scientists to help develop and contribute to a highly skilled, inclusive, and competitive U.S. workforce and economy.
2. Support novel, early-stage research at U.S. colleges and universities that advances the FECM mission of delivering integrated solutions related to fossil energy and carbon management and enable transformation to a sustainable, net-zero greenhouse gas future.

3. Increase research and development opportunities for underrepresented communities within the U.S. and tap into the innovative and diverse thinking of student researchers at minority serving institutions of higher learning.
4. Ensure that students are being equipped with cutting-edge, translatable skillsets that will allow them to contribute to the U.S. workforce and greater economy over the course of a longstanding and enduring career.

To align with the Biden Administration's goals on achieving net-zero greenhouse gas emissions by 2050 and promoting diversity, equity, inclusion, and accessibility, the FECM Strategic Vision[1] calls for enhancing the UTR program to reflect the technologies prioritized by FECM with a focused support for HBCUs and MSIs. This effort also aligns with the need to develop a skilled domestic workforce with development activities that are flexible and responsive to the needs of the community.

As detailed in FECM's domestic engagement framework,[2] FECM is prioritizing two-way engagement tailored to regions and communities where carbon management projects are most likely to emerge, including energy and industrial communities, Tribal and Alaska Native communities, environmental justice communities, and rural communities. In addition, projects funded by FECM are required to develop community benefit plans that address societal considerations and impacts and ensure continuous stakeholder engagement throughout the lifecycle of a project. To ensure these engagement activities scale beyond what can be done by DOE alone, FECM intends to pursue opportunities that will build the engagement capacity of others by working with universities, industry, non-governmental organizations, labor, Tribal and Alaska Native corporations, and other federal and state agencies.

The HBCU-MSI program presents an opportunity to strengthen the knowledge and understanding of the different elements of carbon management systems (e.g., carbon capture from industry and power generation, removal of carbon dioxide from ambient air, conversion of captured carbon emissions into products, and the transport and geologic storage of carbon dioxide) among the students and communities served by MSIs through courses developed by UTR-funded financial assistance This effort would combine the UTR mission objectives of preparing an inclusive and competitive workforce with FECM's domestic engagement goal of working with universities to scale community engagement activities.

Funding of financial assistance actions of this nature would provide the benefits of (1) developing a pipeline of underrepresented students into the carbon management workforce; (2) broadening the network of higher-education institutions with curricula focused on carbon management; (3) generating learning materials for other universities, the public, and

[1] Office of Fossil Energy and Carbon Management. 2022 Strategic Vision. Website: https://www.energy.gov/fecm/strategic-vision-role-fecm-achieving-net-zero-greenhouse-gas-emissions

[2] Office of Fossil Energy and Carbon Management Domestic Engagement Framework. 2022. Website: https://www.energy.gov/sites/default/files/2022-12/FECM%20Engagement%20Framework_12.1.22.pdf

DOE/FECM on how carbon management can be enhanced by incorporating the perspectives of different cultures and communities throughout the United States.

For example, sustainability education at Tribal Colleges has oftentimes been sharply focused on the needs of the tribes served by the colleges,[3] incorporating tribal knowledge and philosophies to emphasize the importance of sustainable practices. Consequently, educational curricula on carbon management could be enhanced by such knowledge of tribal communities and philosophies.

Requested Information:

For this RFI, DOE is requesting input on six topical questions. Organizations are not required to answer questions or provide commentary in every category. Organizations that respond to the RFI can respond *to all or only a portion* of the RFI. To the greatest extent possible, please use the bolded numbers for each question as headings in the body of your response.

This is solely a request for information and is not a Funding Opportunity Announcement (FOA). DOE is not accepting applications to this RFI, nor will DOE reimburse any of respondents' costs in preparing a response.

Question 1: Curricula Components – Based on the potential curricula components listed below, how many courses would be necessary to teach the curricula? Are there additional components which you believe should be added to the list?

Background on greenhouse gas emissions and climate change:

- Distribution and magnitude of global greenhouse gas emissions since the Industrial Revolution.
- The impact of greenhouse gas emissions on Earth's climate.
- The role of carbon management in a broad portfolio of solutions to mitigate greenhouse gas emissions.

Elements of carbon management:

- How carbon dioxide (CO_2) can be bound and separated from gaseous mixtures present at power plants, industrial facilities, or ambient air
- Opportunities to convert captured CO_2 to valuable chemicals, fuels, and materials.
- The geology necessary to safely and permanently store CO_2.
- Modes to safely transport CO_2 from the point of capture to the point of conversion or storage.

[3] Megginson, R.E., Sustainability Education at US Canadian Tribal Colleges. 2022. Ch 5 in The Future of Sustainability Education at North American Universities. University of Alberta Press.

- The evolution of the technologies developed to facilitate capture, transport, storage, and conversion of CO_2 over the last 50 years.

Carbon management in the mid-2020s:

- Policies in the U.S. (federal, state and local).
- Private companies – investments and project developments.
- Voluntary carbon removal markets.

Regional significance of carbon management:

- Opportunities for carbon management in a given region, compared to other opportunities for emissions mitigation.
- Unique regional characteristics that impact carbon management opportunities (e.g. geology, energy access, local climate, population, state regulations and laws).
- The local community's stake in carbon management (i.e., what it can gain or lose from new projects).
- How carbon management can be enhanced by the local community.

Question 2: Staffing – What skills and experience are necessary among staff to effectively develop this curriculum and teach the courses?

Question 3: Time – How much time is required to develop the new curricula and obtain the necessary approvals for establishing new courses? Similarly, how long would it take for a student to complete the new courses?

Question 4: Recruitment and Accessibility –

- How many students at your institution would you estimate to have the interest and anticipated pre-requisites to take the courses?
- What would need to be done (e.g., recruitment, outreach, etc.) to ensure the courses maintain an appropriate level of enrollment?
- Would it be feasible to allow members of the nearby community who are not enrolled at the institution to participate in the courses?

Question 5: Follow-on Opportunities – What additional opportunities should be present for students to continue their education in carbon management upon completing the courses (e.g., research, advanced courses, internships)?

- If you are at an educational institution, are these opportunities already available to students, or would you need resources to develop these opportunities?
- Would the curriculum result in a certificate or minor? Which would be most useful for a student to continue education in this area or obtain employment?

Question 6: Cost – What would be the approximate all-in cost of this effort broken down by the components listed below:

- Staffing, including:
  - Recruiting costs, salary, and start-up packages for new hires.
  - "Teaching leave" granted to faculty to spend time developing the course curricula in lieu of their typical teaching responsibilities.
  - Other staffing needs, according to Question 2.
- University overhead and other indirect costs.
- Tuition, including:
  - Tuition paid by students currently enrolled at the institution.
  - Classroom fees paid by members of the surrounding community not currently enrolled at the institution, if applicable, according to Question 4.
- Development of follow-on opportunities according to Question 5.
- Any additional components deemed necessary for curricula development and course facilitation.

Question 7: Additional Comments – Please provide any other information that would be necessary in developing a relevant curriculum to educate students and community members in carbon management elements.

DISCLAIMER AND IMPORTANT NOTES:

This RFI is not a FOA; therefore, DOE is not accepting applications at this time. DOE may or may not elect to issue a FOA in the future based on or related to the content and responses to this RFI. There is no guarantee that a FOA will be issued as a result of this RFI. Responding to this RFI does not provide any advantage or disadvantage to potential applicants if DOE chooses to issue a FOA regarding the subject matter.

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

FREEDOM OF INFORMATION ACT:

Responses received under this RFI are subject to public disclosure under the Freedom of Information Act. Because information received in response to this RFI may be used to structure future programs and funding opportunity announcements and/or otherwise be made available to the public, **respondents are strongly advised to NOT include information in their responses that might be considered business sensitive (e.g., commercial or financial information that is privileged or confidential), trade secrets, proprietary, or otherwise confidential.**

Consistent with 10 CFR 1004.11, DOE requires that any person submitting information that they believe to be confidential and exempt by law from public disclosure should submit **two well-marked copies:** one copy of the document marked "confidential" which must clearly and conspicuously identify the business sensitive, trade secrets, proprietary, or otherwise confidential information, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. **Failure to comply with these marking requirements may result in disclosure of the unmarked information under the Freedom of Information Act or otherwise.** The Government is not liable for the disclosure or use of unmarked information and may use or disclose such information for any purpose.

If you choose to provide business sensitive, trade secrets, proprietary, or otherwise confidential information, you must include a cover sheet markets as follow identifying the specific pages containing business sensitive, trade secrets, proprietary, or otherwise confidential information:

> **Notice of Restriction on Disclosure and Use of Data:** Pages [List Applicable Pages] of this response may contain business sensitive, trade secrets, proprietary, or otherwise confidential information that is exempt from public disclosure. Such information shall be

used or disclosed only for the purposes described in this RFI DE-FOA-0003216. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

In addition, (1) the header and footer of every page that contains business sensitive, trade secrets, proprietary, or otherwise confidential information must be marked as follows: "Contains Business Sensitive, Trade Secrets, Proprietary, or Otherwise Confidential Information Exempt from Public Disclosure" and (2) every line and paragraph containing such information must be clearly marked with double brackets or highlighting. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

EVALUATION AND ADMINISTRATION BY FEDERAL AND NON-FEDERAL PERSONNEL:

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

REQUEST FOR INFORMATION RESPONSE GUIDELINES:

Responses to this RFI must be submitted electronically to **FECM_UTR_RFI@netl.doe.gov** with the subject line "DE-FOA-0003216-RFI" no later than **5:00 p.m. (ET) on January 5, 2024**. Responses must be provided as attachments to an email. It is recommended that attachments with file sizes exceeding 25 MB be compressed (i.e., zipped) to ensure message delivery. Responses must be provided as a Microsoft Word (*.docx) or Adobe Acrobat (*.pdf) attachment to the email, and no more than 15 pages in length, 12-point font, 1-inch margins. Only electronic responses will be accepted.

DOE will not respond to individual submissions or publicly publish a compendium of responses. However, information included in any submission may still become public via a requirement to disclose under the Freedom of Information Act or other federal law or regulation. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

DOE requests respondents provide the following information at the start of their response to this RFI:

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