

MANUFACTURING TRAINING FOR CLEANTECH ENTREPRENEURS

Laboratory Call for Proposals

Fiscal Year 2016

Office of Strategic Programs

Clean Energy Manufacturing Initiative and Technology-to-Market

Key Dates	
Laboratory Call Issue Date	July 6, 2016
Informational Webinar	3:30 pm (ET), July 11, 2016
Submission Deadline for Proposals	5:00 pm (ET), July 26, 2016
Expected Date for EERE Selection Notifications	August 4, 2016

Summary Information	
Means of Submission	Proposals must be submitted through Exchange. EERE will not review or consider proposals submitted through other means.
Total Amount to be Provided	Up to \$1,000,000
Number of Proposals to be Selected	EERE anticipates selecting one proposal under this Laboratory Call.
Average Amount of Funding per Selected Lab	EERE anticipates providing funding in the following amount: Up to \$1,000,000 per selected Lab.
Period of Performance	7 to 10 Months.
Eligible Entity	U.S. Department of Energy National Laboratories.
Cost Share Requirement	Not required.
Submission of Multiple Proposals	Laboratories may submit one proposal to this Laboratory Call.
Proposal Forms	The proposal template is contained in this document.
Questions	Direct requests for the MForesight report, and questions about the program rules and proposal process to: CleanEnergyManufacturing@EE.doe.gov .

MODIFICATIONS

All modifications to this Lab Call Announcement are highlighted in the body of the FOA.

Mod. No.	Date	Description of Modifications
0001	13 July 2016	<p>Contextual Changes:</p> <ol style="list-style-type: none"> 1. PAGE 5: Section 1D: ...DOE will not match training development or delivery partners with Labs, but will disseminate the information of parties interested in finding partners through a voluntary Partnership list (see section 2G). 2. PAGE 9: G. VOLUNTARY PARTNERSHIP LIST As a general matter, EERE strongly encourages entities from different organizations, scientific disciplines, and technology sectors to collaborate. Multidisciplinary and cross-sector collaboration spanning organizational boundaries enables and accelerates the achievement of scientific and technological outcomes that were previously viewed as extremely difficult, if not impossible. <p>A Partnership List is being compiled to facilitate the formation of teams for the Manufacturing Training for Cleantech Entrepreneurs Laboratory Call. EERE intends to make the Partnership List available over email to interested parties. Any organization that would like to be included on the Partnership list should send an email to CleanEnergyManufacturing@EE.doe.gov. with the following format.</p> <ul style="list-style-type: none"> • The title of the email must contain the phrase “request to partner” • The body of the email must contain the following information: • Name of entity (individual or company) • Point of contact (POC) email address • Category (Select either number 1 or 2. If 2, specify area(s) of expertise): <ol style="list-style-type: none"> 1. National Laboratory 2. External partner with expertise in: <ul style="list-style-type: none"> ○ Curriculum development ○ Manufacturing ○ Entrepreneur training delivery ○ Production <p>The Partnership list with the above information from all interested parties will be sent to all POCs on Friday July 15th at 1 PM (EST) from CleanEnergyManufacturing@EE.doe.gov. Any additional sign-ups to the Partnership list after July 15th will be sent out to the POCs every two days until the close of the Lab Call application period on July 26th at 5 PM (EST).</p> <p>By submitting an email to join the Partnership list, you consent to the dissemination of the above-referenced information. By facilitating this</p>

		<p>Partnership List, EERE does not endorse or otherwise evaluate the qualifications of the entities that self-identify themselves for placement on the Partnership List. EERE will not pay for the provision of any information, nor will it compensate any respondents for the development of such information. Responses submitted to other email addresses or by other means will not be considered.</p> <p>All changes to the Lab Call are highlighted in yellow.</p>

SECTION I: DESCRIPTION AND TOPIC AREAS

A. SUMMARY

The U.S. Department of Energy (DOE) Clean Energy Manufacturing Initiative (CEMI) and DOE Office of Energy Efficiency and Renewable Energy (EERE) Technology-to-Market (T2M) programs aim to increase U.S. competitiveness in manufacturing clean energy technologies and bring new innovative technologies to market. Together these programs share a goal of helping cleantech start-ups grow from proof of concept to manufacturing at scale. As part of this effort, EERE is seeking to engage a DOE National Laboratory (“Lab”) to develop a manufacturing training program for cleantech entrepreneurs. If successful, the program will prepare clean energy hardware entrepreneurs for manufacturing and the industry partnerships needed for scaling production.

B. GOALS

Create a manufacturing training program for cleantech entrepreneurs consisting of online modules and materials for personalized instruction to advance the following objectives:

- Prepare cleantech entrepreneurs at the prototype stage for manufacturing at scale by providing them with information and thought tools to:
 - Self-assess manufacturing readiness,
 - Understand product design in a manufacturing context,
 - Understand the basics of manufacturing processes,
 - Make and evaluate manufacturing-related decisions, and
 - Choose and effectively engage with manufacturing experts.
- Enable cleantech entrepreneurs to ask the pertinent questions at the right time of manufacturing partners.
- Align the manufacturing readiness of cleantech start-ups with expectations of industry and investment partners.
- Prime entrepreneurs to leverage existing resources (e.g. manufacturing experts, contract manufacturers) in their regional networks.
- Aid EERE in the design of a training implementation model applicable to the broad clean energy innovation community.

C. BACKGROUND

Since its launch in 2013, CEMI has conducted an extensive evaluation of opportunities to:

1. Enhance U.S. competitiveness in manufacturing clean energy technologies; and
2. Enhance U.S. competitiveness in manufacturing across the economy by increasing energy productivity.

CEMI conducted outreach across the U.S. with stakeholders from industry, academia, non-profits, incubators, and start-ups through workshops and summits with breakout sessions. Through this outreach, CEMI and T2M identified a manufacturing knowledge gap inhibiting

cleantech entrepreneurs from scaling early-stage prototypes to manufacturing, and an accompanying lack of private sector willingness to help entrepreneurs close this gap. Cleantech entrepreneurs' manufacturing knowledge gap includes a lack of awareness of manufacturing readiness expectations, product design and manufacturing process trade-offs, and the process of engaging with manufacturing partners. This gap persists because typical engineering degree programs de-emphasize hands-on design, the innovation support ecosystem (e.g. incubators and accelerators) lacks the background and tools to provide assistance, and industry partners lack willingness to train entrepreneurs. Thus, EERE is pursuing the development of a training program to help entrepreneurs close their manufacturing knowledge gap.

To inform development of the training, EERE commissioned a report by the NIST- and NSF-sponsored "think-and-do tank" MForesight¹ on the critical topics and content to include in a training program (interested parties should request a copy of the report from CleanEnergyManufacturing@ee.doe.gov). The report also recommends delivery methods and subject matter experts to aid training implementation. The report draws primarily from a workshop of manufacturing experts from academia, government, and the private sector. The recommendations in the report should be utilized as the core of the manufacturing training program; however, the developer of the training program should add its expertise to the training program elements.

This new manufacturing training program should help entrepreneurs bridge the knowledge gap between prototype and manufacturing by emphasizing the early detection of technical and mechanical limitations to manufacturing at scale. Detecting such challenges early can save time and capital, while making start-ups more attractive to the industry partners and investors essential to scaling. As a result of completing the training, start-ups should be able to engage with potential partners to ask and act upon relevant questions of product manufacturability, process, and cost.

D. PROGRAM STRUCTURE

The manufacturing training program for cleantech entrepreneurs involves developing the training and recommending one or more delivery methods. EERE will provide flexibility to the selected Lab to designate execution partners, define final training content, and recommend the training delivery mechanism(s). Applicants are encouraged to conduct outreach activities, such as open houses or webinars, to facilitate partnerships for development of the training content. DOE will not match training development or delivery partners with Labs but will disseminate the information of parties interested in finding partners through a voluntary Partnership list (see section 2G).

E. SCOPE OF ACTIVITIES

EERE will select one Lab to develop the new manufacturing training program for cleantech entrepreneurs and work with EERE to construct a model for the training delivery. The development of the training modules themselves should complement the recommended method

¹ MForesight (Manufacturing Foresight) is an advanced manufacturing "think-and-do tank" out of the University of Michigan led by Dr. Sridhar Kota and jointly funded by NSF and NIST. For more information, see mforesight.org.

for training delivery to cleantech entrepreneurs. EERE anticipates providing up to \$1,000,000 in funding to the selected Lab, which will be responsible for the following deliverables:

1. *Training Development*: The Lab will serve as the lead curriculum developer and will bring in partners, as necessary, to form a team with the following skills:
 - a. Technology-agnostic clean energy expertise
 - b. Manufacturing expertise
 - c. Curriculum design expertise

As the lead training module developer, the Lab is responsible for managing the development process to ensure that the training is completed to satisfactory quality standards and on schedule. The curriculum components (e.g. online videos, worksheets, etc.) must complement the recommended delivery method (see “Recommendations on Training Delivery” below) and must draw from the recommendations in the MForesight report (interested parties should request a copy of the report from CleanEnergyManufacturing@ee.doe.gov). The development of portions of the curriculum can be delegated to partners with permission from EERE.

The format of the training should consist of:

- a. Technology-agnostic self-directed training modules: These modules can be composed of informational (e.g. online videos or slide deck with commentary) or functional (e.g. online worksheets or flowcharts) elements. Relevant case studies must be included in each. The final modules must be in a format that can easily be uploaded to and downloaded from the internet. Each module would be “stand-alone” or accompanied by an instructor’s manual.
 - b. Personalized instruction or mentorship: Some of the training, such as the manufacturability self-assessment, may require one-on-one instruction. The topics that require some sort of mentorship, as outlined in the MForesight report, may involve a personalized component.
2. *Recommendations on Training Delivery*: The Lab is expected to provide recommendations on the training delivery method to be implemented in FY17 even though the Lab may not necessarily deliver the training through this Laboratory Call. The Lab is expected to work with EERE to design the model of training delivery up-front because the delivery method will inform the training content and format (see “Training Development” above). The delivery method is expected to meet the following goals and guidelines:
 - a. Catalytic impact: The delivery mechanism should be catalytic beyond a single training session; that is, it should shape an entrepreneur’s thinking long-term rather than inform a single point in product development.
 - b. Reach target audience: The target audience members for the manufacturing training are cleantech entrepreneurs with an early-stage hardware prototype and little to no manufacturing experience or knowledge.
 - c. Relevance: Manufacturing decisions are typically ignored by cleantech entrepreneurs until absolutely necessary, yet it is essential for start-ups to make

strategic manufacturing decisions early in the prototyping and product design process. Training modules must overcome this barrier and successfully make the case for entrepreneurs to consider manufacturing factors early.

EERE anticipates training delivery through either a Lab-hosted program or through partnerships with connector organizations (e.g. incubators, accelerators, NIST-Manufacturing Extension Partnership (MEP) centers, and/or universities), but welcomes other creative suggestions.

- a. Lab-hosted program: A Lab-hosted program might resemble the structure of Lab-Corps (beginning and ending with in-person sessions, and including virtual training in the middle). Selected instructors would have a combination of manufacturing, commercialization, and entrepreneurial expertise. Entrepreneurs would need to be recruited (see “Reach target audience”) to participate in the training program. The Lab could subcontract with an external organization to assist with training management and entrepreneur recruitment.
- b. Partnering with connector organizations: This method would involve the Lab partnering with one or more organizations that are well-connected with entrepreneurs to deliver the training program. The partner organization(s) should have a history of helping cleantech entrepreneurs (e.g. incubators or accelerators), delivering training (e.g. universities), or expertise in manufacturing (e.g. NIST-MEPs). The Lab would likely disseminate the training content and oversee the delivery.

Proposals will be selected based upon how well the approaches to developing and delivering the training are complementary and support the training delivery goals. Even though the selected Lab is not expected to deliver the training through this Laboratory Call, it is essential for the Lab to work with EERE to make delivery decisions up-front to instruct the format and content of the training modules deliverable.

SECTION II: FUNDING INFORMATION AND ELIGIBILITY

A. TYPE OF FUNDING INSTRUMENT

EERE anticipates funding the laboratory work through the FY 2016 Annual Operating Plan with the National Laboratories.

B. ESTIMATED FUNDING

EERE anticipates that up to \$1,000,000 in federal funds will be available for this program.

Anticipated Number of Selections: 1

Anticipated Funding Amount per Selection: Up to \$1,000,000

EERE is under no obligation to pay for any costs associated with preparation or submission of proposals. EERE reserves the right to fund, in whole or in part, any, all, or none of the proposals submitted in response to this Laboratory Call.

C. PERIOD OF PERFORMANCE

The period of performance will be between 7 and 10 months.

D. ELIGIBILITY

Department of Energy National Laboratories are eligible to apply as the primary applicant and are encouraged to specify partners. The partners may bring curriculum expertise, manufacturing expertise, or entrepreneur training delivery expertise. Ideally, the partners should be committed to participating, but in order to be eligible, the proposal must indicate the stage of recruitment for any anticipated partners.

E. COST SHARING

Cost sharing is not required; however, a demonstration of institutional commitment to the proposed activity is encouraged for all proposals. The institutional commitment may take the form of uncompensated effort; the provision of surplus materials, supplies, or equipment; the provision of access to facilities at no or reduced cost; voluntary cost sharing; mentoring, training, or coaching of personnel; or other methods of involving the applicant institution in the proposed activity.

F. SELECTION NOTICES

Selected Applicants Notification: EERE will notify applicants selected for funding under this Laboratory Call. Notice of selection is not an authorization to begin performance. Selected projects will proceed to the negotiation stage. EERE reserves the right to request additional or clarifying information before proceeding with negotiations for any selection.

Non-selected Notification: Organizations whose proposals have not been selected will be advised as promptly as possible.

G. VOLUNTARY PARTNERSHIP LIST

As a general matter, EERE strongly encourages entities from different organizations, scientific disciplines, and technology sectors to collaborate. Multidisciplinary and cross-sector collaboration spanning organizational boundaries enables and accelerates the achievement of scientific and technological outcomes that were previously viewed as extremely difficult, if not impossible.

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- The title of the email must contain the phrase “request to partner”
- The body of the email must contain the following information:
- Name of entity (individual or company)
- Point of contact (POC) email address
- Category (Select either number 1 or 2. If 2, specify area(s) of expertise):
 - National Laboratory
 - External partner with expertise in:
 - Curriculum development
 - Manufacturing
 - Entrepreneur training delivery
 - Production

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SECTION III: PROPOSAL REVIEW INFORMATION

A. CRITERIA

1. Initial Eligibility Review

Proposals submitted after the final proposal deadline of **5:00 p.m. (ET) on July 26, 2016** will be declined without review. Prior to a full merit evaluation, EERE will perform an initial eligibility review to determine that (1) the applicant is an eligible entity under this Laboratory Call; (2) the information required by the Laboratory Call has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the Laboratory Call. Proposals that fail to pass the initial eligibility review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review Criteria

Proposals will be reviewed and selections will be made based on the following criteria:

Criterion 1: Project Plan, and Approach (60%).

Approach and Work Plan:

- Degree to which the approach detailed in the work plan will achieve the program goals and expectations;
- Degree to which the proposed project is innovative and has the potential to advance the state of the sector;
- Degree to which the approach has been clearly described and thoughtfully considered;
- Degree to which work plan and task descriptions are clear, detailed, timely, and reasonable, resulting in a high likelihood that the proposed work plan will succeed in meeting the program objectives; and
- Degree to which the proposal has demonstrated understanding of potential risk areas involved in the proposed work, and mitigation strategies to address them.

Metrics, Milestones, and Budget:

- The strength of the proposed metrics and milestones, such that meaningful interim progress will be made and measured, and inform future efforts; and
- The reasonableness of the budget for the proposed project and objectives.

Criterion 2: Team and Resources (40%)

Team Competency:

- The capability of the proposed team and available resources to address all aspects of the work plan with a high chance of success;
- Qualifications, relevant expertise, and time commitment of the individuals on the team; and
- Degree to which the proposed team has experience with commercialization training and assistance, or a plan to strengthen the team's expertise in this area.

Resources and Support:

- How well the supporting resources from the Laboratory support the program objectives and commitment to the project's success; and
- Degree to which the proposal demonstrates the capacity to effectively collaborate with relevant partners and stakeholders.

SECTION IV: PROPOSAL SUBMISSION AND TEMPLATE

Proposals must be submitted through Exchange by **5:00 p.m. (ET) on July 26, 2016**. The PI should receive an email acknowledging receipt of the proposal within 24 hours. Please contact brenna.krieger@ee.doe.gov if a receipt is not received. The proposal should include the information requested in Section 1, respond to each of the bullet points in Sections 2 and 3, propose a timeline and budget in Section 4, and be submitted in Portable Document Format (PDF). Proposals may include an appendix of partner commitment letters and team members' resumes (no other information or materials). Proposals must not exceed 5 pages single spaced, 12-point font with standard margins. Commitment letters from partners and an appendix of team members' resumes can be additional pages beyond the 5 page limit. Additional pages beyond that will not be reviewed.

Section 1: Project Administrative Detail

Project Title

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Topic

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Lab

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Principal Investigator

Name:	E-mail:
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Proposed Budget (\$K)

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Period of Performance

Start:	End:
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Section 2: Project Plan

Please describe the project approach, work plan, and how the project will achieve the program goals and expectations:

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Please describe any potential risks or challenges to successfully completing the project plan and mitigation strategies to address these:

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Please describe proposed project metrics and milestones:

Section 3: Team and Resources

Please describe the team members and their abilities, unique roles, time commitment, programmatic relationship, and relevant experience/background. Propose/identify (by name) any curriculum development partners. Please explain any partnership preparation or arrangements, additional staffing needs, or hiring plans:

Please describe the Laboratory's commitment to the project and any additional resources it plans to commit to support the project objectives:

Other notes. If there is other relevant information the Laboratory would like to convey, please include it below:

Section 4: Proposed Project Timeline and Budget

Deliverable/Milestone	Start Date (MM/YY)	End Date (MM/YY)
Total DOE Funding		
Total Non-DOE Funding		
Total		