



Laboratory Call for Energy I-Corps

Fiscal Year 2019

Office of Technology Transitions

Key Dates	
Laboratory Call Issue Date	June 20, 2018
Laboratory POC Registration	Friday 5:00 p.m. (ET), June 25, 2018
Informational Webinar for Laboratory POCs	Tuesday 3:00 p.m. (ET), July 10, 2018
General Informational Webinar	Monday 3:00 p.m. (ET), July 17, 2018
Submission Deadline for Intent to Apply	Accepted through Friday 5:00 p.m. (ET), July 27, 2018
Submission Deadline for Full Team Proposals*	Accepted through Friday 5:00 p.m. (ET), August 17, 2018
Submission Deadline for Site Funding Request	Accepted through Friday 5:00 p.m. (ET), August 17, 2018
Expected Date for Team Selection Notifications	Ongoing through Friday 5:00 p.m. (ET), August 31, 2018
Expected Date for Site Funding Notifications	Ongoing through Friday 5:00 p.m. (ET), September 15, 2018
Summary Information	
Means of Submission	Intent to apply, full proposals, and site funding applications must be submitted by email to EnergyICorps@hq.doe.gov . DOE will not consider proposals submitted through other means.
Total Amount to be Provided	Up to \$1,050,000 for team support, up to \$825,000 for site funding
Max Amount of Funding Per Team	Up to \$75,000 per team, up to 14 teams per cohort
Max Amount of Site Funding Per Lab	Up to \$55,000 per lab per FY
Period of Performance	Two months for training, one FY for site funding deliverables
Eligible Entity	Any U.S. Department of Energy national laboratory
Cost Share Requirement	Not required
Submission of Multiple Proposals	Laboratories may submit multiple proposals
Proposal Forms	Team application documents are provided in this call (See Appendix A and B)
Questions	Questions about the program rules and proposal process may be directed to EnergyICorps@Hq.doe.gov

*Full Team Proposals are only required on request

Important Notes:

In response to program evolution within the Department of Energy (DOE) and feedback from our national lab partners and DOE program office supporters, this Lab Call has several important differences from previous Lab Calls for team proposals, summarized below. Please note that while there are modifications to the application process, **the overall structure and content of the Energy I-Corps training will not change for Cohort 8.**

- **DOE's Office of Technology Transitions now serves as program administrator.** (See Section I C: Background)
- In an effort to meet the demand for this training across new and blended technology areas, **we are no longer restricting applications to those with participating offices listed in the call.** Any team with a technology that otherwise adheres to the program requirements and eligibility will be shared with interested offices, and alternative funding mechanisms may be considered. (See Section II D: Eligibility)
- Following the success of the Lab Accelerator pilot, **participating national laboratories will be eligible to receive up to \$55,000 in site funding** to further the goals of Energy I-Corps and support programmatic execution. (See Section II F: Integration of Lab Accelerator and Reintroduction of Site Funding)
- **The Energy I-Corps team is requesting national labs submit a brief Intent to Apply form for teams prior to submitting full proposals.** Full proposals will only be required following stated interest from one or more DOE offices/external partners. (see Section III A: Process)
- To ensure the spirit of the training as an educational endeavor that teaches a repeatable process for industry engagement, **we are restricting applications to national lab researchers who have not already gone through the program.** Repeat successful applicants will only be considered if they are applying with both a different technology and a different team role than previously held. (See Section II D: Eligibility).
- While teams may request up to \$75,000 in their proposals, **requests for lower amounts of funding will be strictly adhered to and potentially taken into consideration by interested partners.**
- While teams and their supporting DOE office have always been encouraged to communicate during and after the program, **structured debriefs and communication of training deliverables from teams to supporting offices is now a requirement of the program.**

Questions on the above changes will be addressed during the informational webinar for Lab POCs planned for **Tuesday 3:00 p.m. (ET), June 26th 2018.**

Section I: Description and Topic Areas

A. SUMMARY



“As a former national lab scientist who launched a startup with my lab technology, I could have benefitted so much from Energy I-Corps. The tools the program provides have such enormous practical application.”

— Peter Fiske, Energy I-Corps Instructor

“[Energy I-Corps] showed me how I can maximize the benefit of my basic research at Argonne to create technology that has real-world commercial impacts for Americans. That’s a very rewarding feeling.”

— Dr. Ralph Muehleisen, Cohort 1 Alumni

Energy I-Corps, formerly known as Lab-Corps, pairs teams of researchers with industry mentors for an intensive two-month training where the researchers define technology value propositions, conduct customer discovery interviews, and develop viable market pathways for their technologies. Researchers return to the lab with a framework for industry engagement to guide future research and inform a culture of market awareness within the labs. In this way, Energy I-Corps is ensuring that our investment in the national labs is maintaining and strengthening U.S. competitiveness long-term. Following on the success of seven cohorts, we proudly announce this call for applications to be a part of the eighth cohort in fall 2018.

B. GOALS



Energy I-Corps will train lab-based teams utilizing a customized curriculum to advance the following objectives:

- Increase the number of national laboratory-developed technologies that are transferred into commercial development or industry agreements.
- Train national laboratory researchers to better understand potential pathways to market and private sector needs.
- Provide researchers with a framework for industry engagement to guide future research and inform a culture of market awareness within the labs, in pursuit of a more secure energy future.

C. BACKGROUND

The U.S. Department of Energy’s (DOE’s) national laboratories are home to some of the world’s most advanced technologies, facilities, and scientists. The labs have positioned the United States as a leader in energy and technology innovation and have given us an undeniable strategic advantage in the global marketplace. However, many barriers prevent national labs from getting more of their game-changing technologies into the market and collaborating effectively with U.S. innovators and businesses to build next-generation products. DOE invests

billions of dollars every year in U.S. national labs, yet without industry engagement and a business mindset at the labs, that investment has limited economic return.

Traditionally, market value determinations are done through methods such as analysis, workshops, and road-mapping exercises. The Energy I-Corps model aims to more rapidly provide critical feedback to the technology development process using lessons learned from activities like customer discovery interviews and industry mentor interactions. Launched in 2014 under Energy Efficiency and Renewable Energy (EERE)'s Tech-to-Market team, Energy I-Corps (then known as Lab-Corps) was modeled on the National Science Foundation's (NSF's) successful Innovation Corps (I-Corps™) program. DOE sought to create a training program based on the customer discovery process and industry engagement and identified the NSF's I-Corps program as one of the key validated models in this area, specifically focused on increasing the commercial impact of federally funded research and enhancing scientists' market awareness. Started in 2011, I-Corps is a nationally-recognized training program that helps prepare scientists and engineers to extend their focus beyond the lab. Energy I-Corps builds upon the I-Corps model while adapting it to the unique features of the national labs and DOE's mission space.

DOE collaborated with the NSF team to leverage best practices and create a similar training program tailored to the challenges faced by national lab researchers preparing laboratory-developed technologies for market evaluation. The National Renewable Energy Laboratory (NREL) was selected as the Program Node following a competitive selection process alongside the Site Lab and Cohort 1 Lab Call.

Energy I-Corps has benefited laboratory scientists across all EERE technology offices as well as from the Office of Nuclear Energy (NE), the Office of Fossil Energy (FE), the Office of Electricity Delivery and Energy Reliability (OE), and the Office of Environmental Management (EM). In response to the increasing demand for the program's offerings for technology areas outside of EERE, Energy I-Corps became a part of the larger Office of Technology Transitions (OTT) portfolio in 2018. Established within DOE in 2015, OTT is committed to expanding the commercial impact of DOE's research and development portfolio to advance the economic, energy, and national security interests of the Nation. OTT works across the DOE technology portfolio to streamline access to DOE's national labs and foster partnerships that will move innovations from the labs into the marketplace.

D. PROGRAM STRUCTURE

Energy I-Corps consists of four key elements, summarized below:



Lead Lab (aka the Node): The National Renewable Energy Laboratory (NREL) serves as the Node for this program. The Node is responsible for developing and delivering the training, as well as providing program guidance to participating labs. The initial in-person session will likely take place in Golden, CO.

Participating Labs (aka Sites): Energy I-Corps Sites recruit, assemble, and send teams to the Node for training, as well as support teams both during and after the program. Support might include assistance in identifying Entrepreneurial Leads (ELs) and Industry Mentors (IMs), as well as Technology Transfer/Technology Deployment support for potential market pathways identified by the team during training. Each site will also collect metrics during and after their team(s) participation in the program and distribute these quarterly to the Node. These metrics are critical to assessing and improving the program.

Teams: Applicants apply to Energy I-Corps as a team, composed of a Principal Investigator (PI) with a commercially relevant technology, an Entrepreneurial Lead (EL), and an Industry Mentor (IM) (see section I-E for team member descriptions). Over the course of the training, teams identify potential market pathways for their selected technology, as well as identify opportunities where further development could lead to commercial value. The time commitment to this program is significant for both the PI and the EL, and teams should do their best to organize their workload during the training period accordingly.

Training Program: The training program spans two months, utilizing a custom-designed curriculum built on the Lean LaunchPad methodology. During these two months, teams attend in-person sessions, participate in weekly webinars, and learn from one on ones with instructors to systematically identify the most appropriate market application and commercialization pathway for their technology. Participation also requires a considerable amount of time spent outside of the classroom conducting customer discovery interviews.

E. SCOPE OF ACTIVITIES

Funding is provided to cover time and expenses for teams to participate in the two-month training program. A sample syllabus for this training is provided in Appendix B. Below are some of the expected activities for participants:

1. Team presentations
2. Lectures
3. Workshop activities
4. Customer discovery interviews
5. Travel to opening and closing sessions
6. Participation in weekly webinars
7. Completion of pre- and post-training surveys
8. Communication of deliverables due during and after training
9. Regular interaction with lab manager, Node, and DOE supporting program during and after training

Team Requirements



The team is the core unit of the Energy I-Corps program. Each team consists of a Principal Investigator (PI), an Entrepreneurial Lead (EL), and at least one Industry Mentor (IM). Each team member is expected to fully participate in the training program—including the opening in-person session, online sessions, and in-person lessons learned closing session—and together they are expected to meet the requirements set by the Node. Over the course of the training, teams will explore potential market pathways for a selected technology and present a plan that includes next steps for that pathway at the closing session.

Lab Requirements



In addition to supporting the team during and after the program (see Section D: Program Structure), labs are required to provide quarterly updates on their teams, including but not limited to the following information:

- Licenses (in negotiation or executed)
- Start-ups launched (with PI, or built around licensed IP with outside entrepreneur)
- Industry partnerships, such as CRADAs (in negotiation or executed)
- Additional funding (Technology Commercialization Fund [TCF], Funding Opportunity Announcement [FOA] award, outside investment, etc.)
- Publications
- Media presence (articles, blogs, interviews, etc.)
- Speaking engagements (internal or external)
- Invitations to pitch events or technology showcases
- Inclusion in follow-on programs like Cleantech Open, Clean Energy Trust, NSF I-Corps™, etc.
- Advances in Technology Readiness Level (TRL)
- Industry engagement (customer discovery, investor discussions, etc.)

Note: Updates are required for all teams who are continuing to pursue commercialization activities, whether those activities are related to the technology they took through the Energy I-Corps program or not. If there are no updates to provide in a given quarter, a “no progress” statement should be reported.

Metrics are due on the following dates each year:

- March 31st
- June 30th
- September 30th
- December 31st

Recommended Team Structure

Principal Investigator (PI): The technical lead and project manager based at the DOE national lab is responsible for overall team management. The PI should have a laboratory technology or other form of intellectual property identified that the team believes has a potential market application. At least 50% of the PI's time should be committed to this project during the two-month core training period. Prior experience is not required; however, the PI should be committed to pursuing potential market pathways.

Entrepreneurial Lead (EL): The Entrepreneurial Lead may come from inside or outside of the lab. Eligible candidates include, but are not limited to, laboratory staff (beyond the PI), serial entrepreneurs, postdoctoral scholars, or graduate students. The EL is expected to commit at least 75% of their time during the core training period and should expect to contribute the most to coordinating customer interviews, delivering team presentations, and developing the business model.

Industry Mentor (IM): Ideally, the Industry Mentor is an experienced industry representative or entrepreneur with substantial expertise in a relevant sector. He or she is responsible for providing mentorship to the EL and PI through the learning experience. IMs are expected to be present during the in-person opening and closing sessions, and to meet with the team on a weekly basis during the mid-session, as available. Over the course of the program, the IM can expect to contribute up to 15% of their time. To ensure unbiased mentorship, the IM should not have a direct interest in the team's technology or intellectual property.

Use of Team Funds

Each selected team will receive up to \$75,000 in funding via the relevant DOE program office or supporting entity. It is recommended funding be used for the following:

Primary uses

- Principal Investigator's salary (via a charge code) and compensation for the Entrepreneurial Lead, as appropriate; and
- Travel costs to cover training program participation, customer discovery meetings, and industry conferences and events.

Secondary uses (as budget allows)

- Training materials and educational resources;
- Techno-economic analysis;
- Supply chain and/or value chain analysis;
- Market survey reports;
- Technology maturation activities, such as testing and validation; and
- Specialized industry engagement support services from the laboratory or another relevant organization, beyond existing support from the lab site support team.

Funds are intended only for activities that explore the market potential of the selected technology and may not be used for any basic, early-stage, or applied research.

Note: Government-owned, government operated (GOGO) national labs for whom the above restrictions may prevent reasonable participation are free to use funding at their discretion as long as activities are in line with program structure and directed towards their participation in Energy I-Corps.

F. INTEGRATION OF LAB ACCELERATOR AND REINTRODUCTION OF SITE FUNDING

By taking on elements of the Lab Accelerator project and re-introducing site funding as an element of the program, OTT strives to encourage a more comprehensive approach to achieving the shared goals of OTT and the Energy I-Corps program at our national labs. OTT is excited to increase the impact and reach of Energy I-Corps through this financial support, and subsequently see more robust, sustainable Energy I-Corps programming activities at participating site-labs before, during, and after the training. Up to \$55K per lab will be provided to national labs who request site funding through this Lab Call. Funds will be distributed at the beginning of FY19 and are intended to support Energy I-Corps execution throughout FY19.

Site Funding Background

When Energy I-Corps, then Lab-Corps, was initiated in 2016 under EERE, \$50K each was provided to 5 site labs: Lawrence Livermore National Laboratory/Sandia National Laboratory (LLNL/SNL), Argonne National Laboratory (ANL), Idaho National Laboratory (INL), Pacific Northwest National Laboratory (PNNL), and Lawrence Berkeley National Laboratory. The site funding was intended help site labs source and prepare teams for Energy I-Corps. Labs were encouraged to be creative in how to best perform this task, and a number of impactful activities were executed. Activities primarily fell into one of three categories:

1. Recruitment/application support
2. Cohort support for selected teams
3. Culture change and marketing

The positive feedback from provided site funding was in-part what inspired the Lab Bridge program the following year, and consequently the development of the Lab Accelerator pilot.

Lab Accelerator Background



Lab Accelerator

In FY17-18, Tech-to-Market piloted the Lab Accelerator project. Lab Accelerator was one of several projects funded under Lab-Bridge, a one-time funding opportunity for ideas promoting the commercial impact of

DOE national labs. Lab Accelerator involved nine DOE national labs, as well as additional labs that served as non-funded observers. Lab Accelerator proposed a five-part program based on the classic entrepreneurship accelerator model, aiming to combine the expertise and resources of the national labs, universities, and local business/investor communities to streamline the commercialization of national laboratory technologies.

Elements of the project were as follows:

1. Entrepreneurial Curriculum Guide Development: A Curriculum Working Group, in conjunction with input from external expert consultants, developed guidance to be used as each lab executes its own entrepreneurial training program.
2. Entrepreneurial Training at each Laboratory: Each lab designed and executed at least one training class for researchers in their lab using the curriculum guidance.
3. Mentor Network Development: Each lab developed a mentor network from the local business community to engage with trainees.
4. Mentoring and Local Pitch Competition: Each participating lab identified promising teams from the training, paired them with an interested mentor, and had them work together to develop a presentation for a lab-held business pitch competition.
5. National Pitch Competition: LLNL hosted a National Pitch Competition in November 2017 for the winners of the local competitions. Teams from each lab competed for technology maturation money (\$15K) that would allow them to continue commercialization activity. Representatives from the Bay Area investor community were in attendance to observe and provide feedback.

Overall, the project received a lot of positive feedback from participating labs as well as involved external partners and provided invaluable data and best practices for DOE. Outcomes of Lab Accelerator include:

- 169 researchers from nine labs trained
- 80 mentors involved from nine labs
- Nine local pitch competitions
- National pitch competition completed; 1st, 2nd, and 3rd place winners awarded

Appropriate Uses of Funding

Going off lessons learned and best practices gleaned from the prior administration of site funding and the Lab Accelerator pilot, OTT is committed to allowing labs to exercise autonomy in pursuit of shared goals, while providing sufficient guidelines to allow for the collection of common metrics towards continuous improvement. Use of site funding is therefore restricted to activities that are aligned with *one or more* of the following goals:

Goal # 1: Increase Access to Entrepreneurial Training Opportunities

01

Provide broader access to commercialization education and resources at your lab through complementary, but lower-lift training opportunities vs. Energy I-Corps.

Training outside of Energy I-Corps that required lower barriers to entry was one of the most requested and successful elements of the Lab Accelerator program; OTT is excited to help support the expansion or initiation of that work across the DOE energy portfolio. While labs are welcome to utilize varying formats for the training as far as length, timing, etc., labs that use site funding towards this goal are required to utilize the Curriculum Guidelines produced through Lab Accelerator to ensure training across each lab is consistent and rigorous (See Appendix D). Labs should aim to create a baseline understanding of the commercialization process and industry engagement so

researchers entering the Energy I-Corps program are consistently more knowledgeable and prepared to exercise those skills efficiently with every Cohort.

Sample Activities:

- Host weekend training opportunity open to all national lab researchers in conjunction with a local or national academic institution or Accelerator
- Host weekly lunch trainings or after-hour sessions facilitated by Energy I-Corps alumni and/or qualified laboratory staff
- Coordinate with other national labs to create online or digital content aimed at researchers from any national lab
- Initiate training as mandatory professional development for all national lab researchers through your lab's workforce training processes

Sample Metrics:

- # of researchers trained
- # of customer discovery interviews conducted
- # of external partners engaged through training
- Survey ratings for training experience

Goal #2: Support Energy I-Corps Recruitment and Cohort Experience

Solicit interested applicants, provide application support, and support current Energy I-Corps teams through their training experience.



02

Sample Activities:

- Host information sessions for interested Energy I-Corps applicants
- Help potential applicants through application process and standardize a high quality of applications coming from your lab
- Support presentation and video development support for Energy I-Corps participants in the training
- Support marketing efforts around current Energy I-Corps teams through photography, website updates, blogs, etc. to support future recruitment, industry outreach, and lab leadership buy-in

Sample Metrics:

- # of teams that register interest in Energy I-Corps
- # of applicants to each Cohort
- Survey ratings for Energy I-Corps experience

Goal #3: Implement Alumni Support Programming, Events, and Resources



03

Provide routes for continued pursuit of commercialization of promising technologies, and utilize the growing cohort of engaged, informed researchers to educate other researchers and help grow the Energy I-Corps network at your lab and nationwide.

Sample Activities:

- Provide additional training to interested alumni to serve as mentors/instructors for other national lab scientists going through commercialization trainings or Energy I-Corps
- Host regular Energy I-Corps alumni meet-ups and events in conjunction with local industry representatives
- Coordinate with other national labs to host an annual alumni event in conjunction with an Energy I-Corps graduation
- Invest in platforms, software, or social media support that facilitates communication between alumni at your lab and others
- Support alumni through local pitch competitions and/or accelerator programs

Sample Metrics:

- # of industry partnerships that occur after Energy I-Corps training
- # of alumni reported as still actively engaged in the commercialization process of their technology/technologies
- # of external partners engaged through events or activities aimed at alumni support

Site funding is NOT intended to be used for activities with existing funding sources or programs initiated prior to the release of this Lab Call. Funds may go towards supporting national laboratory personnel or external support staff as they execute activities in accordance with the above goals. Activities that engage commercialization partners in your local or national innovation ecosystem are encouraged, assuming they explicitly connect to one of the above goals. Shared funding and/or other programmatic coordination between national labs was an identified best practice of Lab Accelerator and is also encouraged.

Lab Expectations

Labs receiving site funding are expected to collect and report metrics (final metrics will be provided to labs receiving funding) to DOE quarterly and on request throughout FY19, as well as participate in calls and/or in-person meetings with DOE and other lab partners to share progress and lessons learned. Where appropriate, metrics should be collected prior to the distribution of site funding, in order to track changes following listed activities. Qualitative data, including surveys, testimonials, etc. should also be collected and shared with OTT upon request.

Eligibility

While the two-month training remains the cornerstone of the Energy I-Corps program, OTT recognizes that additional access to commercialization education is needed at the national labs regardless of their ability to participate in past or current iterations of the program. All Department of Energy national labs are therefore eligible to request site funding, regardless of prior or current involvement in the training portion of Energy I-Corps.

Request for Site Funding Instructions

We ask that national labs interested in receiving site funding submit the proposal form provided in Appendix C of this Lab Call by the deadline indicated.

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

Call. A request for a specific amount does not guarantee that amount will be disbursed. Specific funding designations will be determined following the deadline for requests, pending the number of requests received, the alignment between proposed activities and the stated goals, and available funding.

Section II: Funding Information and Eligibility

A. TYPE OF FUNDING INSTRUMENT

DOE anticipates funding the laboratory work through FY 2018 Annual Operating Plans with the national laboratories, through the technology office budgets.

B. ESTIMATED FUNDING

DOE anticipates that approximately \$1,050,000 for Cohort 8 teams (subject to the availability of appropriated funds and congressional direction) will be available for this program. Teams will be funded using FY18 funds from participating DOE offices.

Max amount of funding to be provided per team by participating offices: **\$75,000**

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

DOE additionally anticipates that up to \$750,000 for national labs participating in FY19 Cohorts (subject to the availability of appropriated funds and congressional direction) will be available for this program.

Max amount of funding to be provided per lab by managing office: **\$55,000**

C. PERIOD OF PERFORMANCE

Two-month training program for team funding, one FY for site funding

D. ELIGIBILITY

Only Department of Energy national laboratories are eligible to apply under this Lab Call. Teams from any technology area will be considered. Technologies submitted for consideration may be any TRL, but should be at a stage in development that allows the team to identify potential partners within a target market.

To ensure the spirit of the training as an educational endeavor that teaches a repeatable process for industry engagement, DOE is restricting applications to national lab researchers who have not already gone through the Energy I-Corps program. Researchers who have already gone through any previous Cohort of Energy I-Corps successful will only be considered if they are applying with **both** a different technology **and** a different team role than they previously held.

E. COST SHARING

Cost sharing is not required; however, labs may supplement team budgets with internal funding resources. DOE offices may also choose to share costs of a team with an overlapping technology area or external partner.

F. SELECTION NOTICES

Selected Applicants Notification: The technology office or external partner providing funding will work with OTT to select teams prior to the deadline indicated, and the Node will work with each lab to notify applicants selected for funding. Notice of selection will represent that the process for funding actions has begun and depending on lab policies may be considered an authorization to begin performance.

Non-selected Notification: Teams whose proposals have not been selected will be advised as promptly as possible through the Laboratory POC.

Section III: Application Review Information

A. PROCESS

1. Register Laboratory POC

The laboratory Point of Contact (POC) for this Lab Call should be a person with responsibility for Technology Transfer/Technology Deployment (or other relevant area) within the laboratory. To register as a POC for this Call, please send an email with the subject line “Energy I-Corps Site POC Registration” with your name, job title, email, and phone contact information no later than **June 22nd, 2018** to EnergyICorps@Hq.doe.gov.

Laboratory POCs are the primary conduit through which information regarding this Laboratory Call is sent and received from the Node. It is the responsibility of these individuals to make certain that each proposal and supporting materials responsive to this Call are submitted to the Node on behalf of their laboratory on time. It is also the responsibility of the POC to communicate programmatic decisions and actions to the PI named on the application from their laboratory faithfully and accurately as a result of the selection. Laboratories are welcome to name multiple POC(s) if they so desire.

2. Submit Intent to Apply

Laboratory POCs should submit an Intent to Apply form for any interested teams as soon as they are able to do so, which will be used to initiate conversations with potential partners as soon as they are received. See Appendix A for the form and details.

The Energy I-Corps team will work to identify potential partners for teams Laboratory POCs have registered with intent to apply on a rolling basis as they are received, until the deadline indicated. Potential supporters for teams MAY include, but are not limited to:

- DOE program offices, including but not limited to program offices within the Office of Energy Efficiency and Renewable Energy, the Office of Electricity, the Office of Environmental Management, the Office of Fossil Energy, the Office of Nuclear Energy, and the Office of Science.

- Private sources, e.g. early-stage investment firms, etc.

3. Initial Eligibility Review

Prior to a full merit evaluation, the Node will perform an initial eligibility review to determine that (1) the applicant is an eligible entity under this Lab Call; (2) the information required by the Lab Call has been submitted; (3) all mandatory requirements are satisfied; and (4) the proposed project is responsive to the objectives of the Lab Call. Proposals that fail to pass the initial eligibility review will not be forwarded for merit review and will be eliminated from further consideration. Applications which have passed the eligibility review by the Node will be provided to the relevant program offices or external partners for further review and selection.

4. Submit Full Proposals (as requested)

Following the initial merit review of identified DOE program offices or external partners, Full Team Proposals may be requested for further review. Full Team Proposals are **not** required unless requested by a potential partner. Requests for Full Team Proposals will be communicated to Laboratory POCs as soon as they are requested through the deadline indicated.

5. Submit Request for Site Funding

Requests for site funding are by the deadline indicated. Requests are accepted at any point following the release of this Lab Call, however, final funding decisions and allocations will be made following the deadline. The amount each lab will receive will be decided based on the total amount requested for site funding as well as the quality of applications.

B. CRITERIA

1. Merit Review Process and Criteria for Team Selections

The areas of consideration during this review may include, but are not limited to, the following (areas are not weighted or ranked):



1. Potential for market viability and impact
2. Team capabilities and availability
3. Quality of application
4. Fit with program office priorities

2. Merit Review Process and Criteria for Site Funding

The areas of consideration during this review may include, but are not limited to, the following (areas are not weighted or ranked):

1. Potential impact of listed activities on stated goals of site funding and the Energy I-Corps program

2. The quantity and quality of applications received by the deadline

Section IV: Other Information

A. MODIFICATIONS

Notices of any modifications and other correspondences related to this Lab Call will be sent to all registered laboratory POCs.

B. PRELIMINARY TRAINING DATES



Kickoff Webinar: September 19, 2018

In-Person Opening Session: October 2-5, 2018 (Location TBD)

Weekly Webinars: Wednesday afternoons: October 10th – November 7th

In-Person Closing Session: November 13-15 (Location TBD)

Section V: Proposal Submission Instructions and Templates



Both Intent to Apply and Full Proposals must be submitted by email to Energy1Corps@Hq.doe.gov. Senders should receive an email acknowledging receipt within 24 hours. Please contact Zack.Baize@hq.doe.gov if a receipt is not received. Intent to Apply should utilize the template in Appendix A. Full Team Proposals should utilize the template in Appendix B. Word documents of each will be provided to Laboratory POCs.

Instructions

1. All applications must be submitted through a registered laboratory POC. Applications submitted outside of this process will not be considered.
2. Applicants must utilize the templates provided below and submit applications through their laboratory POC to the submission email address provided.

Team Member Identification

At a minimum, the PI for the team must be identified at the time of submission. The EL and IM should also be identified at this time, when available. If the EL and IM are not identified at the time of submission, the PI should indicate their plan for identifying remaining team members (source, timeline, etc.). All remaining team members must be identified no later than September 7th, 2018.

Appendix A: Intent to Apply Form

Department of Energy's Energy I-Corps Intent to Apply Form

Applications Due: **5:00 p.m. (ET) Friday, July 13th**

Please fill out the table below and submit responses as a word document (.doc or .docx) to

EnergyICorps@Hq.doe.gov

Lab	
Identified team members (Full name, position, e-mail)	
Have any team members participated in previous cohorts of Energy I-Corps? (YES / NO) If YES, please identify which member and their previous role. (PI / EL)	
Technology area	
Brief technical description (no more than 200 words)	
Brief description of how the team would utilize/benefit from the training (no more than 200 words)	
Amount of funding requested (max is \$75k)	
Which DOE technology offices do you think might be interested in funding this project?	
Are there alternative sources of funding (e.g. private industry partners) who you think might be interested in funding this project?	
Are the identified team members currently available to participate in the Cohort 8 dates listed in the Lab Call?	

Appendix B: Full Team Proposal

Department of Energy's Energy I-Corps Full Team Proposal Form

Applications Due: **5:00 p.m. (ET) Friday, August 10th**

Please submit answers as a .doc or .docx to EnergyCorps@Hq.doe.gov

1. Team:

Please attach short bios for each member – one page max for each. (See Lab Call for member descriptions.)

- a. Principal Investigator (PI):
- b. Entrepreneurial Lead (EL):
- c. Industry Mentor (IM):

2. Funding:

- a. How was the development of your technology funded? (AOP, LDRD, etc.)
- b. How much funding are you requesting? (Max is \$75k)

Please attach a high-level budget that details the breakdown of your team's time and expenses (should include travel to opening and closing sessions).

3. Selected Technology:

- a. Title(s):
- b. Technology area:
- c. Brief technical description: (250-word limit)
- d. What intellectual property (IP) has been generated, and what is the status?

4. Describe the problem that your technology solves, and for whom the problem is being solved: (250-word limit)

5. Have you identified any competitors working in this space? Who might be your competition? How does your solution differ from the competition? This should include your market's current technology providers and innovators working on similar projects. (100-word limit)

- Why do you and your team want to participate in Energy I-Corps? What do you hope to learn or accomplish? (250-word limit)

Appendix C: Request for Site Funding

Department of Energy’s Request for Energy I-Corps Site Funding Form

Requests Due: **5:00 p.m. (ET) Friday, August 31st**

Please complete the following and submit answers as a .doc or .docx to EnergyICorps@Hq.doe.gov

- Requesting lab:
- Lab employees that will be involved in the execution of this funding (name, position, contact information):
- Amount of funding requested? (Max is \$55K):

As a reminder, funding must directly further one or more of the following goals (see Section II F for more details).

Goal # 1: Increase Access to Entrepreneurial Training Opportunities*

Provide broader access to commercialization education and resources at your lab through complementary, but lower-lift training opportunities than Energy I-Corps.

Goal #2: Support Energy I-Corps Recruitment and Cohort Experience

Solicit interested applicants, provide application support, and support current Energy I-Corps teams through their training experience.

Goal #3: Implement Alumni Support Programming, Events, and Resources

Provide routes for continued pursuit of commercialization of promising technologies, and utilize the growing cohort of engaged, informed researchers to educate other researchers and help grow the Energy I-Corps network at your lab and nationwide.

**Curriculum Guidelines (See Appendix D) must be utilized if putting funding towards this goal.*

Describe the activities you intend to execute with Energy I-Corps site funding. Please be as specific as possible.

Activity	Which goal(s) of the site funding does this activity support?	What is your anticipated budget for this activity?	What impact on the goal(s) metrics do you expect to see from this activity? / How will you measure success?

Appendix D: Curriculum Guidelines

The following was prepared as a deliverable for the Lab Accelerator project and is meant to guide individual curriculum development for labs choosing to put site funding towards organized commercialization trainings at the labs. See Section II F for more details.

Note: *While trainings should be complementary to the Energy I-Corps program, utilizing the Energy I-Corps name is a trademark violation of the NSF I-Corps program and our Memorandum of Understanding with NSF. Lab-organized trainings should therefore **not** use the Energy I-Corps or I-Corps name in their branding.*

Lab Accelerator - Part of the Lab Bridge Pilot Program

Energy I-Corps Preparation Class Curriculum

Note to the National Laboratory Accelerator Participants- This is a recommended and not a required curriculum for early training of US DOE National Laboratory scientists and engineers who are interested in entrepreneurship and the commercialization of technology. It is recognized that in the development of such training each Laboratory will avail themselves of the training resources available to them. This could be local universities, consultants, or other resources. It is likely that these resources will not provide all of the content exactly as described herein. This is acceptable as long as the fundamentals of commercialization are presented. Within this document are links to training resources that are very relevant to Energy I-Corps and can be incorporated either formally or informally into any commercialization training program a particular Laboratory may develop. At a minimum, self-study of this content is recommended to all participants.

Course Overview – This training is part of the Lab Accelerator program, and will allow DOE national laboratory scientists across broad technology areas, to experience Lean Launch concepts. While these scientists and engineers may not end up finding a distinct technology, and completing the Energy I-Corps boot camp, it is the intent of the program to provide these technologists with a new way of contemplating market impact of their research.

The goals of this curricula, and the resulting class that is created from it, should:

- 1) Increase technology impact by providing researchers tools to explore possible end uses
- 2) Increase innovation
- 3) Introduce concepts that allow researchers and engineers to communicate effectively with any customer (program manager, private sector, even your own management)
- 4) Increase effective industry engagement

Logistics – This course should be completed in 4-6 sessions totaling 8-12 hours or more. Please note that the National laboratory providing this course should attempt to cover the six modules defined in this curriculum. The laboratory may supplement this material with its own case studies, and its own learning modules.

In each learning module, the development team has attempted to identify some videos, and other ancillary material, that could help enhance the teaching points.

Course Material – The development team recommends that participants in this class have access to the following. Please note that these recommendations are intended to REINFORCE the concepts of the class.

- 1) Business Model Generation: A Handbook for Visionaries, Game Changers and Challengers – Alexander Osterwalder and Yves Pigneur (John Wiley and Sons)

- 2) The Startup Owner's Manual – The Step-by-Step Guide to Building a Great Company – Steve Blank and Bob Dorf (K&S Ranch, Inc.)
- 3) SteveBlank.com – Video collection from the founder of Lean Launch

Curriculum Learning Modules

- 1) **Introduction**
- 2) **Business Model Canvas**
- 3) **Product Market Fit**
- 4) **Customer Discovery**
- 5) **Market and Competitive Analysis**
- 6) **Technology Transfer and Commercialization at a National Laboratory**

Module 1: Introduction

Key Teaching Points	Course overview, accelerator process, comparison of scientific process to lean launch, asking questions, business model canvas
Pre-Work	
Resources	Video: Lean Launchpad Class at Stanford Impact: Discussion of possible learning in Lean Launch
	Video: Why Founders and PIs Need to Get Out of the Building Impact: Avoiding confirmation bias, understanding that perceptions aren't always correct
	Slide Deck: Peter Fisk's Story of Commercialization in Laboratory Impact:
Possible Discussions	What do you want to get out of this class?
	How do you determine that your work is driving in the right direction?

1.0 Objective #1 - What can you get from this process? (NOTE: A Energy I-Corps or I-Corps alumnus could give this overview)

- 1.1 You will learn tools that will serve long-term for your scientific career
 - Improved FOA preparation
 - R&D Directive – how you approach the objectives that you set.
 - Innovation – which drives science – increases
 - Prepare you for Energy I-Corps and Accelerator process – if you want to go into it
- 1.2 Where this all started
 - Method for finding a NEED before doing work to develop
 - Understanding what customers really want
 - Saving time and money
 - RECOMMENDATION – Show video
 - Lean Launchpad Class at Stanford

2.0 Objective #2 - Course Overview and Introduction

- 2.1 Why Energy I-Corps exists
- 2.2 Connection with I-corps – same process, different audience
- 2.3 Class Expectations
- 2.4 What will be taught
 - Lean Launch
 - Product Market fit
 - Getting information – Customer Discovery
 - Business Model Canvas
 - Technology Transfer and Conflict of Interest at Labs

- Market and Competitive Analysis

2.5 Where you can go

- Energy I-Corps teams have: Attracted ARPA-E funding, non-DOE funding, state funding, private funding
- RECOMMENDATION – Show video from Energy I-Corps team from your lab

3.0 Academic culture vs. business culture

- Seems so foreign
- Words like “value proposition”, “customer segment”, “revenues” will become common
- Scientific process is VERY SIMILAR to Lean Launch
 - Develop hypothesis for a customer segment
 - Collect Data and revise
 - Hypothesis becomes your value proposition

4.0 Key Concepts

4.1 Lean Launch

- Foundational aspects – asking questions to get information
- Start small before going big
- Getting out of the building to ask questions
- People WANT to talk with you

4.2 The Business Model Canvas(BMC) – Your Laboratory Notebook for Energy I-Corps

- BMC becomes your “concept paper” for a product idea – A full business plan would be your “Full Proposal”
- Right side – Delivering to customer
- Left side – Resources and activities to get you there
- Why write a full business plan before you have a customer identified?
 - BMC: Concept Paper as Business Plan: Full Proposal

4.3 Asking Questions

- Most challenging part of concept – getting out of your comfort zone
- RECOMMENDATION – Show Video: Why PIs and Founders need to get out of the building

END OF MODULE DISCUSSION – What do you want to get out of this class?

Module 2: Business Model Canvas

Key Teaching Points	Parts of canvas, what do they mean, how to start, translating a technology into BMC-speak
Pre-Work	Identify a technology (if teams don't have one, we suggest bringing in something from your Tech Transfer office, and letting them use that to develop a BMC)
Resources	<u>Slides: BMC Intro Slides from Energy I-Corps</u>
	<u>Document: Technologies from lab that teams could consider</u>
	Document: Sample BMC from a Energy I-Corps team
Possible Discussions	What part of the canvas is the most challenging for you to fill out?
	What kind of questions should you ask to be able to fill this BMC out?
	How could the BMC help you in your everyday research?

1.0 Why use a one-page business model

- Efficiency for an iterative process (i.e. you wouldn't write a manuscript/paper on your first hypothesis)
- Provides a “snap-shot” in time – will demonstrate how your knowledge grows

- Can inevitably be “outline” for full-fledged business plan
- Remember – it’s your concept paper as you are looking to write a full proposal!

2.0 BMC Elements

- Description of all 9 elements
- Use of example beneficial here

WORKSHOP – Teams of 2-4 fill out a BMC based on a technology

MODULE WRAP-UP DISCUSSION – 1-2 teams present their BMCs to class

- More than likely, Value Proposition(s) will be a list of features
- **NEED TO ASK PROBING QUESTIONS TO GET ANSWERS** that help fill out canvas

Module 3: Product Market Fit (Value Propositions and Customer Segments)

NOTE: This is the KEY SESSION for this short course. Topics covered address “MEAT” of the Lean Launch Process.

Key Teaching Points	What is a value proposition, how does a value proposition tie to a customer segment, difference between a feature list and a value proposition, different types of customers, definition of a product market fit
Pre-Work	First BMC completed
Resources	<u>Video: Steve Blank - The Value Proposition</u>
	<u>Video: Steve Blank – The Customer Segment</u>
	<u>Document: Customer Segment Introduction Slides – Energy I-Corps</u>
	<u>Video: The Customer Persona</u>
Possible Discussions	Examples of products, with the class working to define the market and value proposition.
	Defining a DOE Technology Manager as a customer

1.0 Definition

- A product that has been matched to a market segment – there is a specific value proposition that ties these two aspects together
- **EXAMPLES:** From previous, successful Lab teams – maybe through licenses, or Energy I-Corps?
- **DISCUSSION:** Give some “products” and see if the class can define their market

2.0 How do you get a product market fit? Why is it important?

- Goal of any business is to generate revenue
 - NOTE; Revenue can be RESEARCH FUNDING
- How to find a customer
 - NOTE: Broad use of customer ok here
- Customer has to understand what YOU bring to them
- That “fit” creates revenue

3.0 What is a value proposition – RECOMMENDATION: Show video: Steve Blank – The Value Proposition

- Value Propositions will ALWAYS map 1:1 with customer segments
- You’re first stab is always WRONG – you are making an ASSUMPTION without any data. But you have to start somewhere.
- How to translate what is said into what means to lab researchers
 - Founder – That can be the PI

- Value Proposition – Similar to a scientific hypothesis
 - Customers – Can be program manager(s), management, industry
 - Why do this?... there needs to be a REASON. The REASON is Value Proposition
- 4.0 Customer Segments – RECOMMENDATION – Start with Steve Blank – The Customer Segment video
- Different types of customers– Saboteurs, decision makers, etc.
 - Gains and Pains – These folks will buy something (a Gain) that solves their pains
 - Most important aspect – not your product, but your customer
 - Archetypes – who are these people in SPECIFIC DETAIL
 - Don't boil the ocean... FOCUS on a customer segment
 - Multiple customer segments are possible, but each PROBABLY has different value proposition

WRAP-UP ACTIVITY – Deeper look into BMC Value Propositions to see how they can grow from a feature set into a value proposition.

Module 4: Customer Discovery

Key Teaching Points	Getting out of the building and testing your hypotheses, how to start setting up interviews, asking questions, analyzing the responses, minimum viable product (MVP)
Pre-Work	Set-up 5 possible interviews
Resources	Video: The Customer Discovery Process
	Video: The Interview Process
	Reading: Prototyping the Palm Pilot – The MVP
Possible Discussions	Develop a list of first interviews
	Develop a list of questions to ask several of your interviews
	Translating customer discovery to DOE client discovery

RECOMMENDATION: Play video: The Customer Discovery Process

1.0 Customer Discover Process

1.1 Figure out if there's product market fit by:

- Constructing a BMC
- Conduct experiments (INTERVIEWS) to test your hypothesis
- Test your solution on customers
- Assess the results of the experiments
- SOUND FAMILIAR – Scientific process for BUSINESS

2.0 GET OUT OF THE BUILDING

- You aren't going to get REAL answers by talking to your friends
- Talk to customers ACROSS your market segment
- Use all types of interviews (i.e. Skype, phone, video conference), but STRIVE to get as many IN PERSON interviews as possible
 - Why – easier to read people
 - Gauging interest in real time
 - Pivoting on questions based on reactions
- How to ask probing questions
- Starting small and moving big
- Going off-script
- RECOMMENDATION: Show video THE INTERVIEW PROCESS

3.0 Minimum Viable Product

- Smallest possible feature set – created BASED on customer discovery
- When available, get this in front of customers to test

- RECOMMENDATION – Have class read the article on the Palm Pilot MVP

CLOSING ACTIVITY – Send class out to complete their 5 interviews. Complete next day with a wrap-up discussion of the results.

Module 5: Market and Competitive Analysis

Key Teaching Points	What is a competitor, types of addressable markets, estimating market sizes
Pre-Work	
Resources	Video: Market Opportunity Analysis
	Video: Total Available Market
Possible Discussions	There is always a competitor
	Competitor landscaping for a product (defined by instructor)
	Completing a market assessment using Google

1.0 Addressable Markets

- Definitions
- Total addressable market (TAM)
- Service Available market (SAM)
- Target Market (TM)

2.0 Competitors

- No such thing as a “non-competitive market”
 - Customer always has the option of doing nothing
- Looking outside the box for competitors
- Dealing with competitors once they are located
 - Can you partner with them
 - Can you work with them
 - Are they a M&A target
 - Maybe they are your customer?

Module 6: Technology Transfer and Commercialization at a National Laboratory

Key Teaching Points	Patenting, conflict of interest, licensing, partnering, start-ups, technology transfer office
Pre-Work	None
Resources	Document: Partnering at a National Laboratory
Possible Discussions	So you want to be an entrepreneur. Entrepreneurial Leave/Conflict of interest considerations in a National Lab.
	Should I patent or publish... or both?

1.0 Technology Transfer

- Legislation
 - Stevenson-Wydler
 - First law to promote tech transfer
 - Bayh-Dole
 - Election of title to federally funded inventions
 - American Invents Act

- Changed patenting from First to File to First to Invent
 - Lab Notebooks more critical than ever
- Facilitating Agreement Types
 - Material Transfer Agreements
 - Non-Disclosure/Confidentiality Agreements
 - Technology Management/Inter-Institutional Agreements
 - Exploratory Research License
- Licensing Agreements
 - Commercial
 - Exclusive
 - Non-exclusive
 - Limited exclusive
 - Software Site
 - Software Marketer
 - Academic/Research Use
 - Option
 - In-License
 - When are each of these used?
 - Fairness of Opportunity – Laboratory must ensure widespread notice of available technologies
 - Can't just "pick" partner
 - Executed agreements can satisfy FOO
- R&D Partnering Mechanisms
 - Strategic Partnership Projects (was Work for Others, or WFO)
 - Cooperative Research and Development Agreement
 - Agreement for Commercialization of Technology
 - Differences and when each is suggested?

2.0 Conflict of Interest

- Definition – arises when a person's position, or other, puts them potentially on both sides of a negotiation. They can benefit either way
- Individual vs. Organizational
- How does this effect licensing/partnerships?
- Management Strategies
- Entrepreneurial Leave Policies – what do they mean?

WRAP-UP DISCUSSION – Demystifying your technology transfer office. Motivations for success.