

SOLICITATION FOR INNOVATION CROSSROADS INNOVATORS

Energy Technology Innovation

Background

The U.S. and the world require new approaches to energy that are reliable, affordable, and carbon neutral. While important progress has been made in cost reduction and deployment of clean energy technologies, the pace of innovation and the scale of transformation and dissemination remains significantly short of what is needed.

Innovation Crossroads is being established by the U.S. Department of Energy (DOE) at Oak Ridge National Laboratory (ORNL) to provide entrepreneurs with a unique support system to enable them to transform their early stage ideas for advanced materials- or manufacturing based-energy technologies into scalable companies that can provide solutions in clean energy. This is not an easy journey. It usually requires extensive R&D work and the development of business models, partners, and financing mechanisms, often simultaneously. Innovation Crossroads will select up to five energy innovators to explore their ideas at ORNL, providing initial resources they need to address these challenges. With up to two years of funding, from ORNL and DOE's Office of Energy Efficiency and Renewable Energy (EERE), innovators will have the opportunity to focus full-time on their energy idea, on R&D collaborations with ORNL researchers, on entrepreneurial training and mentoring, and on introductions to potential industry partners and investors.

ORNL is the US Department of Energy's largest science and energy laboratory. With an annual budget of \$1.5 billion, ORNL's diverse capabilities enable the lab to explore fundamental science challenges and to carry out the research needed to accelerate the delivery of solutions to the marketplace. From energy-efficient buildings, transportation, and advanced manufacturing to materials, and energy technologies ORNL delivers technology solutions for the nation's growing energy demands. With access to one-of-a-kind resources and facilities, selected Innovation Crossroads innovators will be uniquely positioned to advance their transformative energy ideas.

Opportunity

Innovation Crossroads, in partnership with business mentors, will help selected innovators in the physical sciences and energy technologies to mature their early stage innovations. As part of Innovation Crossroads, EERE will directly fund ORNL to work with each selected innovator to develop their technology. Additionally, EERE will provide an Oak Ridge Institute for Science and Education (ORISE) fellowship to the selected innovators. ORNL is presently looking for up to five innovators for its first cohort of the Innovation Crossroads program.

Benefits to selected innovators may include:

- Up to 2 years of Innovation Crossroads resources (subject to performance & availability of funding) including the following:
 - Personal stipend, travel allowance, and health benefits through ORISE fellowship;

- Lab space & technical collaboration support from ORNL; and
- Innovation Crossroads programming and mentorship.
- Continued benefits after “graduating” for up to 5 years in total (innovators will graduate after the earlier of 2 years in the program or upon raising \$2M in private-sector funding) that may include the following:
 - Continued technical collaboration support from ORNL through a Cooperative Research and Development Agreement (CRADA) on a pay-in basis;
 - On-site Innovation Crossroads lab occupancy on a pay-in basis; or
 - Access to Innovation Crossroads programming on a pay-in basis.

Each of the above is contingent upon availability of funds and personnel, negotiation of a mutually agreeable scope of work, as well as DOE approval.

Application Materials

Innovator applicants must submit the following materials:

- **You** (page 1): Provide the back story on you and your project. Where did the idea originate? What is the current status of your technology and team? Why do you want to pursue this effort and what makes you qualified to do so?
- **Your vision** (page 2-3): Describe the technology concept you want to pursue. Use the Heilmeyer catechism as a guide for what’s most relevant. Please also comment on the potential for impact on U.S. energy and manufacturing competitiveness.
- **Why Innovation Crossroads?** (page 4): What most attracts you to the Innovation Crossroads program? Why would this be the ideal home for you and your project (vs. alternative paths)? Which people or facilities at ORNL would be particularly valuable in supporting your work?
- **Your business idea** (page 5): Briefly describe how you envision making your technology a market reality. Please describe the market you intend to reach, its customers, potential suppliers/distributors/manufacturers, relevant intellectual property (and identification or status of any licenses, per the Eligibility requirements below), barriers to entry, sophistication of market, market incumbents, etc.
- **Any Affiliation with Oak Ridge National Laboratory:** Please identify whether you, your family members, or your company have any affiliation with Oak Ridge National Laboratory, its operator UT-Battelle, LLC, the Battelle Memorial Institute, or the University of Tennessee. If there is no affiliation, please indicate that as well.
- **What else?** (page 6) An extra page. Your call.
- **Resume:** Please append to the same PDF file a one-page resume.
- **Innovation Partner:** Please identify the name of any other innovators who may be applying for participation in Innovation Crossroads that you wish to consider as an innovation partner. These potential partners must apply separately.

Applicants should submit an application through the link at innovationcrossroads.ornl.gov. All applications must be received by October 30, 2017 by 5:00 pm Eastern in order to be considered.

Eligibility

In order to be considered, the applicant must meet each of the following criteria:

- Applicants apply as individuals, not as companies or organizations.
- Applicants must:
 - Must have completed the requirements for a PhD by May, 2018;
 - Be first-time technical company founders; and
 - Be either U.S. citizens or lawful permanent residents.
- Must be focused on an advanced materials- or manufacturing-based energy technology.
- Must have the potential for broad impact that aligns with EERE's mission to advance the national, economic, and energy security of the United States. Incorporated entities may not apply, although individuals that apply may have incorporated entities.
- Innovators must not have raised more than \$1M in private-sector funding at the time of application.

Employees of Oak Ridge National Laboratory are not eligible to participate in Innovation Crossroads as innovators while they are directly employed by ORNL. While innovators may be ORNL employees at the time of application, they must take Entrepreneurial Leave or terminate their employment with the Laboratory in order to participate.

Selection Process and Criteria

Selected applicants will be evaluated based on the following criteria:

- **Project Leader(s) (60%):** We are looking for the very best outcome-oriented, entrepreneurial technical innovators who have the drive and ability to build a foundational technology vision and lead a team in its development. The ideal candidate would exhibit exceptional:
 - Technical strength (detailed knowledge, conceptual depth and breadth)
 - Outcome orientation (problem-based and system level thinking, risk evaluation, and commercial awareness)
 - Personal excellence (passion and drive, resourcefulness, management & communication skills, personal integrity, team orientation, ability to rapidly learn and adapt)
- **Project Concept (40%):** While ideas may evolve, we want to ensure that the initial project concept is technically sound, reasonably differentiated, and addresses a well-framed problem with significant long-term impact potential. The ideal project would exhibit exceptional:
 - Impact on U.S. energy economy (potential for large-scale impact, techno-economic feasibility, credible path to impact with viable entry markets)
 - Technical merit (technical feasibility, differentiation, clear risk mitigation plan)

- Business idea (market research, customer/supplier/distributor evaluation, establishment/identification of intellectual property, understanding of the market including: barriers to entry, sophistication of market, market incumbents, etc.)
- Innovation Crossroads fit (materials science and/or manufacturing technology, Innovation Crossroads support would drastically improve time/probability of success, ORNL has resources and expertise to support the project, project works well with or in a national lab and/or research institution)
- Projects must have potential for long-term impact in enabling materials and manufacturing solutions that advance the Department of Energy's mission to create reliable, clean, and affordable energy solutions that advance the national, economic, and energy security of the United States.

All applicants will be reviewed by ORNL, and must be selected by a federal official from DOE's Office of Energy Efficiency and Renewable Energy.

Nature of the Partnership with ORNL

Selected innovators will contract with the Laboratory through standard non-negotiable Cooperative Research And Development Agreements (CRADAs) approved by the Department of Energy. The work may be divided into two phases, a Scope and Planning Phase followed by a Research and Development (R&D) phase.

Scope and Planning Phase:

During the Scope and Planning Phase (typically less than 6 months), the innovator will work at the Lab and will undertake paper-based analysis such as performing market studies, refining the scope of their research project with ORNL personnel, surveying the intellectual property landscape of their technology, and other activities designed to increase the chance of success in the subsequent R&D Phase. Since no hard R&D is allowed in this phase, background Intellectual Property (IP) will not be of concern. Innovators are expected to develop an IP Management Plan as part of the Scope and Planning phase, subject to the appropriate DOE Technology Manager's approval with concurrence from DOE Patent Counsel, before proceeding to the R&D phase. The IP Management Plan should identify and provide a path for obtaining any background IP rights, if necessary, that may be needed to perform R&D work under the CRADA and commercialize their technology.

In some cases, this phase may be short or not needed at all.

R&D Phase:

Once the Scope and Planning phase has been completed (or if it is not needed), the R&D Phase of the project can proceed (subject to DOE approval).

Please note that as with any other cooperative research and development project conducted with a National Lab, an innovator's failure to abide by its DOE approved IP Management Plan could result in delayed work, deferment or removal from the program. Please note that selected innovators do not have

any rights to Lab or third party background IP by virtue of selection or participation in this program. If an innovator requires any Lab background IP they should reach out to the Lab's technology transfer office.

Business Mentorship

Selected innovators will be expected to engage with a business mentor organization that meets the qualifications set by Innovation Crossroads within 90 days of innovators starting the Innovation Crossroads program (innovators' project start date is currently scheduled for March 2017). The business mentor organization will serve a number of functions, and there will be no compensation provided to the business mentors for their services. An overview of the functions filled by the business mentor organization are as follows:

- Provide key business mentorship and venture development services in areas that will enhance the impact of the program and success of technology innovators, e.g. assistance with company formation, business development assistance and guidance, community and network development, investor advising, customer discovery, techno-economic analysis, etc.;
- Support administration of compliance requirements for technology innovators who lack infrastructure and require business support at the earliest stages;
- Work closely with technology innovators in their efforts to attract private sector funding and engagement.

Conflict of Interest

Any work in connection with Innovation Crossroads must comply with ORNL's Prime Contract, as well as applicable policies—including those pertaining to the avoidance of apparent or actual conflicts of interest. Innovators who have an affiliation, (either direct or through an immediate family member) with ORNL, its operator UT-Battelle, LLC, Battelle Memorial Institute, or the University of Tennessee will be subject to a personal and/or organizational conflict of interest management plan.

Proprietary Application Information – Trade Secrets, Commercial or Financial Information

Applications will be reviewed by scientific and industry experts from within and outside of ORNL and DOE. If the applicant desires application information to be kept proprietary, there will be a marking process in the application to allow for this.

Intellectual Property Including Innovations, Inventions and Patents

The Laboratory does not have claim to any background intellectual property that selected applicants bring to the program. Selected applicants will be granted certain rights in data, copyrights and patents that innovators create in the course of the program, pursuant to the terms of the CRADA between ORNL and the successful applicants.

As a general matter:

1. Selected applicants will have the ability to designate generated information as protected for a period of not more than five years (subject to a government right to use data for government purposes).
2. Selected applicants may copyright and publish (consistent with appropriate national security considerations, if any) material developed under the CRADA (also subject to a royalty-free license to the government).
3. Selected applicants may retain the principal worldwide patent rights to any invention the applicants develop under the CRADA, subject to a reserved government use license and other limitations that can be found in the Code of Federal Regulations, 37 CFR 401.
4. For inventions developed by ORNL under the CRADA, selected applicants will not own the invention, but will instead have an option to choose an exclusive license for a pre-negotiated field of use for reasonable compensation to such ORNL inventions. This right lasts for the term of the CRADA plus six months.
5. An IP Management Plan is established by participants in this program in order to establish clear and transparent set of mutual expectations for management of both the background and subsequently developed intellectual property relevant to the proposed activities.