Penn State’s Institutes of Energy and the Environment (IEE) has five strategic research themes of focus (listed alphabetically): Climate and Ecosystem Change; Future Energy Supply; Smart Energy Systems; Water and Biogeochemical Cycles; and Health and the Environment. This year our seed grant program will support each of these themes as we do each year. In addition, this year we are interested in supporting three crosscutting topics: Food-Energy-Water Systems, Ultra-High Performance Buildings, and Energy and Environmental Resilience. Each of these crosscutting topics is briefly described below.

IEE established our Seed Grant Program four years ago to foster basic and applied research focused on strategic interdisciplinary research that leverages faculty expertise across the university. Over the previous rounds, IEE has awarded over $2 million to 96 interdisciplinary projects with investigators from 15 Penn State colleges and campuses. This year, we are increasing the size of our inter-campus and intercollege grants to a maximum of $50,000. For 2018-2019, at least $500,000 of funding is available.

Preferred activities for funding under the Seed Grant Program are:

- Development of new interdisciplinary research teams to position them for substantial external funding success;
- Novel research in theme areas, especially high-risk proof of concept projects; and
- Collaboration between junior and senior faculty to promote research development, mentorship.

Please note that Health and the Environment proposals should respond to this RFP. THERE WILL NOT be a separate Health and the Environment RFP call this year. We will be accepting proposals for all five of the IEE research themes and this year’s three strategic priorities through this call.

In addition, to increase the impact of the Seed Grant program and align with expanding federal and foundation opportunities we will be giving consideration to proposals addressing the following three strategic topics:

1) Food-Energy-Water Systems. This topic is emphasized in the Penn State University Strategic Plan’s Stewarding our Planet’s Resources thematic priority: “with a projected global human population of 8 billion by 2040, food and water consumption is expected to increase by 50 percent, and energy requirements by even more. Urgent research, development, and implementation needs exist regarding water, energy and food, and there are even more pressing challenges in effectively, ethically, economically, and sustainably managing the interactions among them...” Additional details are at: https://strategicplan.psu.edu/thematic-priorities/stewarding-our-planets-resources/

2) High Performance Building Systems. Penn State has been endorsed by the United National Economic Commission for Europe (UNECE) to lead the Buildings Global Buildings Network, an international research and education effort to dramatically reduce building energy use while increasing occupant health and quality of life. An “Ultra” High-Performance building system is a building or community of buildings capable of
achieving net zero carbon-based energy utilization while delivering measurable indoor environment parameters, leading to quantifiable increased occupant performance and reduced health risks. The required building system paradigm shift can be achieved by an integrated systems design, delivery and operation of buildings that includes explicit enabling of proactive occupant interaction. Realizing such a building system paradigm shift requires the convergent research of several very different disciplines including but not limited to architectural engineering, architecture, information technologies, materials science, distributed energy technologies, human behavior and health sciences, investment and finance models, regulatory and policy issues. A document describing this research agenda is available to Penn State accounts online at: https://psu.box.com/s/gt3lfbn198fc11z61dlpre8f08ag4vv5

3) Energy and Environmental Resilience. Flood, drought, blackouts, gridlock...many human and natural systems are under increasing stress from climate, population and development, and the many dimensions of consumption. It is imperative that we understand the impacts of these stresses, the ability of systems to withstand, recover or adapt, the dynamics of tipping points, and the design principles required for establishing more robust and resilient systems. These impacts, responses and design principles can apply to ecosystems, agriculture and forests; to water, energy and transportation infrastructure; and to communities and regions. This strategic priority encourages proposals that will advance the scholarship of resilience focused on energy and/or environmental applications.

Seed Grant Eligibility
All Penn State faculty members (tenured, tenure track, and fixed term) who hold an appointment of half-time or more at any Penn State campus are eligible to submit a seed grant proposal as a Principal Investigator (PI). Researchers, students and staff from Penn State, Pennsylvania state agencies, federal agencies, and private industry may be included as collaborators in seed grant proposals. Please note that while most proposals are expected to include multiple investigators, there can only be one responsible PI for each application. In addition, investigators may only serve as PI on a single proposal. New investigators will be given preference over those who may have previously received an IEE seed grant.

Funding Availability
To encourage establishment of new collaborations and enhancement of networks, larger grants will require innovative partnerships of investigators from multiple colleges and/or campus locations. Funds up to $50,000 are available for multi-college (across University Park) and multi-campus (between campuses) collaborative grants; up to $10,000 for two or more faculty from the same college (University Park) or at a single Commonwealth Campus; and up to $5,000 for a single investigator project.

Funds can be used to support research development and coordination expenses such as:

- Graduate and undergraduate student support
- Instrumentation fees and sample analysis to collect preliminary data
- Equipment, supplies, and participant payments
- Travel associated with conducting/reporting seed grant research (Penn State participants only)
- Hosting a research planning meeting for an interdisciplinary team
- Planning and hosting conferences and symposia
- Funding for data conversion technology and wages to support data conversion

**Funding is limited or not allowed for the following:**

- Single college/campus funding, even with faculty from several departments, is capped at $10,000
- Summer or supplemental salary support for faculty
- Postdoc salary
- Travel support to attend conferences

**Submission Instructions**

All pre-proposals must be submitted electronically via upload from the link at https://psu.infoready4.com/#competitionDetail/1775623 no later than 5:00 pm on Wednesday, November 7, 2018. Each pre-proposal is limited to a 1-page project description and additional pages for an appendix.

The one-page project description must include the following:

- Title of project
- List of PI and collaborators, including college, department and/or campus
- Short description of the project (understandable by an interdisciplinary audience)
- Short description of how this project will leverage seed funding
- Nature of collaboration (new/existing; mentorship opportunities)
- Total funding to be requested, including short description of anticipated expenditures

The appendix will include a list of all collaborators, their colleges and/or departments, and 1-page resumes for the PI and all co-PIs.

**Timeline for pre-proposals and proposals (note, all deadlines are Wednesdays)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Oct. 10, 2018 11:00-12:00</td>
<td>Informational webinar for pre-proposal questions</td>
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<tr>
<td>Nov. 7, 2018</td>
<td>Pre-proposals due no later than 5:00 pm</td>
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<tr>
<td>Nov. 14, 2018</td>
<td>Pre-proposal notifications; full proposals requested</td>
</tr>
<tr>
<td>Dec. 19, 2018</td>
<td>Full proposals due no later than 5:00 pm</td>
</tr>
<tr>
<td>Week of Feb. 4, 2019</td>
<td>Seed Grant funding decisions announced</td>
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Grant funds will be available by April 1, 2019 and must be expended by June 30, 2020.

**Review Criteria**

Pre-proposal and Proposal reviews are based upon the following criteria:
1. Intellectual merit of the proposal, including relevance to strategic priorities and contribution to global leadership in a prioritized theme; creativity and innovation; significance of goals and results; soundness of research plan; and likelihood of successful project completion. Please note that these proposals are reviewed by a cross section of researchers with different backgrounds; your ability to communicate your ideas to a broader audience is important for success with interdisciplinary project review panels.

2. A credible and clearly articulated strategy for leveraging this seed grant investment into exceptional scholarship and/or significant external funding. Potential for additional/continued activity beyond the seed grant phase may include plans for continued activity such as applications for external support from federal, state or local government agencies, industry, private foundations, etc.; plans for continued research activities involving in-kind support, teaching activities, on-going scholarly work, etc.; plans for public engagement and outreach; and expanded implementation by external stakeholders. Providing specific examples, including specifics of external funding opportunities, contact with program officers, etc. has been helpful in establishing the credibility of these strategies to prior seed grant reviewers.

3. Realistic potential for developing new and productive collaborations between PIs, with special consideration given to mentorship and collaborations between junior and senior faculty. Possibilities for additional activities and projects which draw upon the seed grant partnership should be specified.

4. Appropriateness of the budget request for supporting the proposed research.

5. Extra consideration will also be given to projects that are able to take data and help leverage that into knowledge and on the ground impact. For more on this criterion, see http://www.iee.psu.edu/research.

Pre-proposals will be reviewed by a set of reviewers, and categorized as “Request Proposal” or “Do Not Request Proposal.” Those invited to submit a full proposal will be given additional information.

Please direct any questions regarding the proposal process to iee@psu.edu.