

Opportunity Title: Building Technologies Office Post-Doctoral Opportunity in Grid-Interactive Efficient Buildings

Opportunity Reference Code: DOE-EERE-STP-BTO-2018-1203

Organization U.S. Department of Energy (DOE)

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How to Apply A complete application consists of:

- An application
- Transcript(s) - For this opportunity, an unofficial transcript or copy of the student academic records printed by the applicant or by academic advisors from internal institution systems may be submitted. Selected candidate may be required to provide proof of completion of the degree before the appointment can start.
- A current resume/curriculum vitae (CV)

The resume/CV must include the following:

- **Basic applicant Information:** Name, address, phone, email, and other contact information.
- **Work & Research Experience:** List all work and research experiences beginning with current or most recent. Include the name of the employer, location, position held, and time period involved.
- **Leadership Experience:** List experiences (e.g., work, civic, volunteer, research) that demonstrate your leadership skills. Detail your role, type of experience, organization, location, and duration.
- **Educational History:** List all institutions from which you received or expect to receive a degree, beginning with current or most recent institution. Include the name of the academic institution, degree awarded or expected, date of awarded or expected degree, and academic discipline.
- **Honors & Awards:** List in chronological order (most recent first) any awards or public recognitions. Include the name of awarding institution, title of the award or honor, and date of award or honor.

All documents must be in English or include an official English translation.

If you have questions, please send an email to DOE-RPP@oraui.org.

Please list the reference code for this opportunity in the subject line of your email.

Description The Energy Efficiency and Renewable Energy (EERE) Science and Technology Policy (STP) Fellowships serve as a next step in the educational and professional development of scientists and engineers by providing opportunities to participate in policy-related projects at DOE's Office of Energy Efficiency and Renewable Energy in Washington, D.C. Under the guidance of a mentor, participants will become part of a group of highly-trained scientists and engineers with the education, background, and experience to be part of the workforce that supports the DOE's mission in the future.

This opportunity is located in the Office of Energy Efficiency and Renewable Energy (EERE) Building Technologies Office (BTO). EERE's



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mission is to create and sustain American leadership in the transition to a global clean energy economy. Its vision is a strong and prosperous America powered by clean, affordable, and secure energy.

In 2016, residential and commercial buildings consumed more than 40 percent of the Nation's total energy and more than 74 percent of the electrical energy, resulting in an estimated annual national energy bill totaling more than \$380 billion. Widespread adoption of existing energy-efficiency building technologies – and the introduction and use of new technologies – could eventually reduce energy use in homes and commercial buildings by 50 percent. This would save almost \$200 billion annually on energy bills and help create jobs. BTO's mission is to support research and development (R&D), validation, and integration of affordable, energy-saving technologies, techniques, tools, and services, to enable industry and others to develop and deploy technologies that can improve the efficiency and reduce the energy costs of the nation's homes, offices, schools, hospitals, and other commercial and residential buildings in both the new and existing buildings markets.

The Emerging Technologies (ET) Program of the Building Technologies Office (BTO) supports early-stage research and development (R&D) for technologies and systems that contribute to reductions in building energy consumption. The goal of the ET Program is to enable the development of cost-effective technologies that can reduce building energy use intensity by 45 percent by 2030, relative to the consumption of 2010 energy-efficient technologies. The ET Program strives to meet this goal through early-stage R&D in heating, ventilation, air-conditioning, and refrigeration (HVAC&R) and water heating; solid-state lighting; and windows and the building envelope. Collectively these areas account for more than 60% of the energy consumed by the buildings sector. These efforts are complemented by sub-programs in building energy modeling (BEM) and Sensors and Controls (S&C) which together cover portions of the cyber-physical world by integrating sensing and actuation with computing and communications to monitor and control the physical component technologies within the buildings space. BEM informs envelope design and material selection, as well as selection and sizing of HVAC components. Sensors and Controls ensure energy savings from efficient equipment are achieved by monitoring and correcting for faulty operation, as well as provide opportunities for additional savings by optimizing more sophisticated control sequences and tuning operations to match environmental conditions and occupancy patterns. In recent years, ET has also invested in transactive controls to enable individual building loads to dynamically convey their willingness to consume power at a certain level using a price signal and then compete with each other to optimally allocate total building demand response between individual building loads at the lowest cost. Field testing, validation, and verification is essential to evaluating implementation and performance challenges of transactive controls in real world, operational settings and especially across buildings at the neighborhood or campus scale. In parallel, BTO is in the processing of developing an overarching strategy for "Grid-Interactive Efficient Buildings" (GEB) to integrate energy

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efficiency with grid services and leverage foundational advancements in BEM, S&C and transactive controls to enable flexible buildings that are “grid friendly.”

The ET Program seeks a talented and committed individual among the pool of qualified candidates to participate in projects and activities in support of GEB at the intersection of the BEM, S&C, and transactive field testing portfolios.

Learning and Professional Development opportunities include:

- Participate in technical reviews/assessments of proposed research and development plans, conduct technical and economic feasibility analysis, as well as evaluate at a deep technical level the progress and ongoing viability and success potential of projects toward meeting the BTO energy efficiency goals. This includes periodic technical reviews and providing rigorous technical feedback for funded R&D projects; as well as observe the negotiation of statements of work and project management plans with technically rigorous milestones, go/no-go decision points, stage-gates and deliverables for new awards.
- Participate in the assessment of the state-of-the-art scientific literature and practice in relevant technologies and assess new opportunities for further advancement in the field and the industry. This will include contributing to completion of ET’s contribution to the BTO GEB strategy and complementary roadmaps. Collaborate with other BTO Fellows on techno-economic analyses in support of GEB and develop short-term and long-term quantitative goals for GEB and supporting sub-programs (S&C, BEM, and as the need arises Windows & Envelope, HVAC, and Solid-State Lighting).
- Support integration of BTO’s GEB portfolio with the Department’s grid modernization efforts.

Participant Benefits

Selected candidates will receive a stipend as support for their living and other expenses during this appointment. Stipend rates are determined by EERE officials and are based on the candidate’s academic and professional background. Relocation expenses, not to exceed \$5,000, incurred in relocating from the participant’s current address to Washington, D.C. (if more than 50 miles from the address shown on the application), may be reimbursed. Fellows will receive a travel allowance of \$10,000 per Fellowship year to cover travel-related expenses to scientific and professional development activities.

For more information about the EERE Science, Technology and Policy Fellowships, please visit <https://www.energy.gov/eere/education/energy-efficiency-and-renewable-energy-science-technology-and-policy-program>.

Appointment Location

Washington, DC

Nature of Appointment

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The participant will not enter into an employee/employer relationship with ORISE, ORAU, DOE, or any other office or agency. Instead, the participant will be affiliated with ORISE for the administration of the appointment through the ORISE letter of appointment and Terms of Appointment.

Qualifications Program eligibility requirements can be found at: visit <https://www.energy.gov/eere/education/energy-efficiency-and-renewable-energy-science-technology-and-policy-program>.

- An advanced degree (PhD preferred) in Engineering or Physical Sciences.
- Knowledge of cyber-physical systems and/or energy efficiency concepts, technologies and RD&D programs, including those related to the areas of forecasting building energy use, building energy modeling, building design and operations.
- Computer programming in Python preferred, but not required.

- Eligibility Requirements**
- **Citizenship:** LPR or U.S. Citizen
 - **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree.
 - **Discipline(s):**
 - **Chemistry and Materials Sciences** ([12](#))
 - **Engineering** ([27](#))