**POSITION TITLE:** Postdoctoral Energy Fellow

**POSITION TERM:** One-year position, beginning immediately, potentially renewable contingent upon satisfactory performance and the availability of funding.

**ORGANIZATION:** Duke University Energy Initiative, Duke University, Durham, NC

**ORGANIZATION BACKGROUND.** The Duke University Energy Initiative (energy.duke.edu) is a university-wide interdisciplinary collaboration focused on advancing an accessible, affordable, reliable, and clean energy system. The Initiative reaches across business, engineering, environment, law, policy, and the arts and sciences to educate tomorrow’s energy innovators, develop new solutions through research, and improve energy decisions by engaging business and government leaders.

As a part of the Energy Initiative, the **Energy Data Analytics Lab** is developing and applying advanced data analytics tools to transform diverse energy data into insight that leads to energy system performance improvements. Improvements include increased reliability, resiliency, environmental sustainability, and productivity, along with reduced costs. The Lab is a hub of research, education, and engagement activity with thought leaders in the business and the policy world around energy data analytics, and will engage with a broad spectrum of experts and stakeholders to provide energy data-focused solutions to challenging problems in the energy space.

**Bass Connections** is university-wide program for students to engage in interdisciplinary problem-based project teams. These students of multiple educational-levels spend a year working for credit on a team-based project guided by Duke faculty and staff. The goal of Bass Connections is to elevate the importance of exploring societal and cultural challenges by engaging faculty and undergraduate, professional, and graduate students in teamwork; integrating disciplinary approaches and professional practice; and applying knowledge, research, and skills in problem solving. There are five thematic areas of Bass Connections including Energy, Brain & Society, Information, Society & Culture, Global Health, and Education & Human Development.

**POSITION SUMMARY.** The Postdoctoral Energy Fellow will report to the Managing Director of the Energy Data Analytics Lab at the Duke University Energy Initiative. The Fellow will be engaged in applied energy data research projects and co-lead team-based educational experiences through Bass Connections.

**Research.** The Fellow will produce computational tools, written reports including journal publications, oral presentations including conference presentations, and web-based media such as interactive data visualizations. Additionally, the Fellow will assist with the analysis of unique data sets from external partners including energy companies and government agencies. The projects that the Fellow will work on will vary based on the areas of greatest research need and the particular expertise and interests of the Fellow. Problems under investigation can be distilled into three overarching questions related to energy systems: (1) How can big data be used to develop baseline assessments of energy systems and resources? (2) How can data analytics be used to evaluate the impact of interventions in energy systems and on energy resources? (3) How can new data analysis tools and techniques be used to better forecast and predict energy system performance, costs, and resources? Examples of current projects include work on smart-grid data analytics (e.g., non-intrusive load modeling, energy storage failure prediction), remote identification and estimation of energy systems using aerial image recognition (e.g.,
solar panels, building energy consumption), shale gas production estimation, and estimation of the impact of behavioral nudges vs automation on energy efficiency. Relevant tools and experience include statistical modeling, machine learning, data mining, and visualization.

**Teaching.** The Fellow will work with faculty to design and co-lead a research project team of 4-8 undergraduate and graduate students in a for-credit, two-semester Bass Connections project experience. The Fellow will work with other faculty co-leaders to act as a project manager for the experience, and act as the point of contact for all students, faculty, and staff. This project will be developed based on the mutual interest of the Fellow and the research interests of the faculty and staff affiliated with the Energy Initiative. The Fellow will develop syllabi, assignments, introductory materials, and other educational tools to train the students in the area of research. The fellow will guide the students through the research process, empowering them to act more independently as the year progresses.

**Other Duties.** The Fellow will also assist with the broader activities of the Duke University Energy Initiative, as needed, including organizing an energy data analytics research workshop, assisting with the development and implementation of energy data educational modules for classroom and laboratory use, student mentoring, and other duties as assigned.

**PREFERRED QUALIFICATIONS.** The ideal candidate will possess...

- A Ph.D. in a relevant technical field including, but not limited to, statistics, engineering, computer science, economics, mathematics, or energy systems.
- Strong writing skills, particularly for scholarly publications.
- Polished verbal communication skills in presenting to both technical and non-technical audiences.
- An independent work ethic, requiring minimal supervision across multiple simultaneous projects.
- Exceptional organizational and project management skills, with attention to details even in situations with multiple simultaneous projects.
- Proficiency in one or more of the following programming environments/languages: Matlab, Python, R, Stata, C/C++, Java, JavaScript.
- Experience processing data including cleaning (handling missing or corrupt data), analysis (using statistical methods), and visualization.
- Familiarity with database management systems including structured relational databases (i.e. SQL), and unstructured systems (i.e. NoSQL).
- Knowledge of or willingness to learn about energy systems including electricity generation, transmission, distribution, and power market operation and technologies; transportation systems and fuels; and consumer energy efficiency decision-making and strategies.

**TO APPLY:** Send an email/cover letter, CV and the names and contact information of three references to Kyle Bradbury, Managing Director of the Energy Data Analytics Lab (kyle.bradbury@duke.edu).

Applications will be accepted until the position is filled.