

# CALL FOR PROPOSALS

## Energy, Environment & the Digital Economy

The Environmental Law Institute (ELI), in partnership with the Center for Law, Energy & the Environment at UC Berkeley Law and the Industrial Environmental Management Program at the Yale School of Forestry and Environmental Studies, is soliciting proposals for research on the energy and environmental impacts of the digital economy. The focus is on three areas: sharing platforms, artificial intelligence, and blockchains. This initiative is generously supported by the Alfred P. Sloan Foundation.

### FOCUS AREAS

Projects should focus on one or more of the following priority areas:

- **Sharing Platforms** – For this solicitation we define sharing platforms as web-based systems that can support efficient search, contact, and contracting and enable multi-sided marketplaces (e.g., Uber, eBay, Airbnb, Craigslist).
- **Artificial Intelligence (AI)** – Our focus is on how AI can help maximize benefit and minimize harm, such as by reducing energy use and avoiding environmental impacts, in sectors such as transportation (including autonomous vehicles), manufacturing, buildings, food and agriculture, and energy generation.
- **Blockchain** – We are interested in examining both the energy use of blockchain technologies and their possible application to energy and environmental challenges.

Proposed projects can include, but are not limited to:

- Research to better understand the *implications* of these new technologies on energy and the environment, such as developing better quantitative estimates of first-order and second-order impacts;
- Research to estimate the impacts of *applications* of the technologies, for instance the potential energy use savings or reductions in emissions or water;
- Research to develop *governance* or other mechanisms for existing or emerging applications that could accelerate their adaption and positive impacts, while mitigating unintended consequences.

### PROJECT DESIGN

Projects that support the following goals will be prioritized:

- Stimulate interdisciplinary research
- Fill existing knowledge gaps
- Inform governance approaches (where relevant)

- Encourage collaboration among researchers
- Contribute to more cohesive, interdisciplinary, and cross-sector communities of interest/practice

The maximum grant amount is \$35,000, with a maximum project duration of 18 months. In addition, we anticipate giving smaller grants to support workshops or meetings that can bridge disciplines, create communities of interest/practice, and generate high-value products such as research agendas or codes of conduct. Indirect costs are limited to 12 percent of total direct costs on all grants. Funds are available for international proposals, with preference given to those done with U.S. partners.

### **APPLICATION PROCESS**

Interested researchers should submit a short proposal of no more than eight pages, double-spaced (including references, graphs, tables and other supplemental materials). The proposal should detail:

- What question or questions are being addressed and why they are important
- Data needs and data collection strategy (if applicable)
- Analytical methods and tools
- Partners (please include a short letter of intent or email from key partners in an appendix)
- Expected outcomes (such as a journal article, white paper, briefing, pilot project, or codes of conduct)
- Outreach plan for results
- Plans or opportunities to leverage other funding

Please also provide the following appendices:

- CVs (no more than two pages) of the researchers involved
- Project budget
- Short conflict of interest statement that discloses any financial or other interests of the researchers that could affect the proposal

Proposals should be submitted by **June 15, 2018**, to: [digitaleconomy@eli.org](mailto:digitaleconomy@eli.org)

A review panel will evaluate the proposals. Researchers who submit proposals that are selected for funding will be notified by **July 31, 2018**. Selected recipients are required to attend a kick-off workshop in Berkeley CA in the fall of 2018 (probably at the beginning of October), and a final workshop to present their results in Washington DC in the spring of 2020 (travel and lodging will be covered).

### **Contacts:**

- David Rejeski, *Director of the Technology, Innovation and Environment Program, Environmental Law Institute, [rejeski@eli.org](mailto:rejeski@eli.org)*
- Jordan Diamond, *Executive Director of the Center for Energy, Law and Environment, University of California, Berkeley School of Law, [jdiamond@law.berkeley.edu](mailto:jdiamond@law.berkeley.edu)*
- Reid Lifset, *Resident Scholar and Associate Director of the Industrial Environmental Management Program at the School of Forestry and Environmental Studies, Yale University, [reid.lifset@yale.edu](mailto:reid.lifset@yale.edu)*

### **Illustrative Research Topics:**

Proposals are welcomed on topics that include, but are not limited to:

**Implications:** Clarify the energy use and/or environmental impacts in each area under study, beginning with the creation of better information on baseline energy use and expanding to account for more complex interactions and impacts of human behavior, demographic change, etc. Projects could include:

- Narrowing the band of estimates regarding blockchain energy use, or energy use savings achievable by applying AI to buildings, supply chain management or other activities.
- Developing energy and environmental metrics for online sharing platforms or AI and blockchain applications to quantify impacts for companies, consumers or other users.
- Determining whether the use of ride-hailing apps will induce people to give up private automobiles or postpone their purchase, reducing emissions impacts. Similarly, does Airbnb usage increase travel and travel-related impacts over time? How do lifecycle transitions (marriage, children) – Millennial Shifts – affect sharing platform usage? Is there a predictable pattern over time? What research methodologies could answer these questions?
- Developing strategies, platforms, protocols, etc. for the acquisition, verification and sharing of data about digital technology use and relevant energy and environmental effects.

**Applications:** Develop possible future use scenarios that could inform research and decision-making, especially those that explore interactions and synergies, for instance, between sharing platforms and AI, or force a wider systemic view, i.e., going beyond ride sharing to examine shared mobility impacts.

- What strategies/scenarios could reduce energy impacts from blockchain-based mining operations, for instance, co-location near low-carbon energy sources or peaker plants for load smoothing?
- How could the use of autonomous vehicles for ride sharing affect vehicle miles travels and emission patterns? What incentives or policies could significantly reduce impacts?
- How could digital ledger systems, like Ethereum, be applied specifically to energy and or pollution reductions and what could be achieved?
- What applications of these technologies (sharing platforms, AI, or blockchains) could give rise to privacy, security, or data manipulation issues?
- What are the energy and environmental implications of a future DIY Machine Learning movement, where machine learning algorithms can be created cheaply by relative novices?

**Governance:** Explore governance models for different platforms that will support reductions in energy use and environmental impacts. For instance:

- What mechanisms could be used to ensure algorithmic transparency regarding energy and environmental impacts? What are the advantages and disadvantages of different mechanisms, for instance, those that are integrated (ethics bots) or rely on third party, external validation through audits or other means?
- What approaches are needed to develop prototype voluntary codes and principles that integrate energy and environment into efforts on AI governance? What would such codes look like, or how could a pilot project be designed, implemented and evaluated? Can emerging ethical codes of

conduct for AI, like those from the Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems (IEEE), be expanded to apply to energy and environmental decision-making by AI systems?

- What are the energy and environmental risks or opportunities from self-learning AI, or in the case of blockchains, public blockchain platforms such as Ethereum in which governance is determined by whatever the majority of nodes decides or may be self-executing?