

590s.03 Impact Evaluation: Energy and Development Spring 2019

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Course description – full

Access to clean and modern energy (electricity, natural gas, biogas, etc.) is key to both meeting basic needs and achieving economic growth (World Bank, 2006; UN, 2016). For example, with one in five people throughout the world still lacking access to electricity, an urgency surrounds this push to increase electrification rates and access to energy more broadly in many developing countries. Indeed, energy access was included in the recently Sustainable Development Goals, ensuring it continues to be a development priority through at least 2030 (UN, 2016).

Universal energy access is often viewed as a catalyst for economic growth and development, yet the existing evidence on the welfare impacts of electrification remains mixed. An incomplete understanding of the microeconomic foundations of the energy-development relationship is both a significant knowledge gap and a critical policy challenge. Indeed, governments and international organizations alike are mobilizing considerable resources to ensure access for all, but there may be profound opportunity costs associated with large-scale investments in energy infrastructure in low-income settings.

With an increasing number of organizations operating at the energy-development intersection seeking to determine the extent to which their programs or policies have a causal impact on particular outcomes, the ability to understand rigorous impact evaluations and the methods they employ has become a valuable skill. This course will provide students with an understanding of (1) the status of empirical economic evidence on the energy and development relationship, and (2) the importance of causal evidence to estimate the impacts of energy interventions and policies in developing countries. This course aims to provide the skills necessary to both evaluate the merits of existing studies as well as propose future impact evaluations.

To do so, the course will first cover the empirical methods commonly employed in such evaluations. Applications of these methods will be understood through topics such as measuring the energy “ladder”, the demand for and role of electrification in development, the demand for energy efficiency, the health impacts of and demand for clean cook stove technologies, and spillovers in technology adoption, amongst others. Before the end of the course, students will apply these methods by designing their own impact evaluation and commenting on other students’ proposed evaluations.

GOALS OF THE COURSE:

- To understand the current status of (and gaps in) the economic evidence on the energy-development relationship;
- To understand the case for evaluating the impacts of energy-related programs and policies in developing countries;
- To understand conceptually the empirical economic methods commonly applied to evaluate programs and policies and to assess the relative strengths and weaknesses of these methods;

- To build skills necessary to identify research questions relevant for policy, how an impact evaluation might contribute to current understanding for such policies, and the appropriate empirical methods used to measure impacts of a given program or policy.
- To build the case for an impact evaluation and evaluate the merits of proposed research given existing research, methods employed.

SAMPLE OF COURSE TOPICS & READINGS

Examples of topics covered within the course (and the related literature) are listed below:

- **Energy and development – Why do we care?**
 - Rogers, J. and S.P. Williams. Lighting the World: Transforming our Energy Future by Bringing Electricity to Everyone (2015). Select chapters.
- **Energy and development – How (can) they develop together?**
 - Wolfram et al. “Poverty, Growth, and the Demand for Energy” *Journal of Economic Perspectives* (2012)
 - Gertler et al. “The Demand for Energy-Using Assets amid the World’s Rising Middle Classes” *AER* (forthcoming)
 - Hanna and Oliva “Moving Up the Energy Ladder” *AER: Papers & Proceedings* (2015)
- **Electrification and development – Is it all good?**
 - Dinkelman. “The Effects of Rural Electrification on Employment: New Evidence from South Africa” *AER* (2011)
 - Lipscomb et al. “Development Effects of Electrification: Evidence from the Topographic Placement of Hydropower Plants in Brazil” *AEJ: Applied Economics* (2013)
 - Burlig and Preonas (2016) “Out of the Darkness and into the Light? Development Effects of Rural Electrification”
 - Assunção et al. “Electrification, Agricultural Productivity and Deforestation in Brazil”
- **Energy efficiency – Can EE programs help?**
 - Davis et al. “Cash for Coolers: Evaluating a Large-scale Appliance Replacement Program in Mexico” *AEJ: Economic Policy* (2014)
 - Boomhower and Davis. “A Credible Approach to Measuring Inframarginal Participation in Energy Efficiency Programs” *Journal of Public Economics* 113 (2014)
 - Carranza and Meeks “Energy Efficiency and Electricity Reliability”