September 2016

Energy and Economic Growth
Applied Research Programme

EEG Newsletter

Welcome to the first newsletter of the Applied Research Programme on Energy and Economic Growth! We're glad of your interest in the programme and hope you enjoy reading this newsletter.

Subscribe to EEG updates

Contents

Interview with EEG Research Director Professor Catherine Wolfram

Catherine Wolfram (EEG Research Director) is the Cora Jane Flood Professor of Business Administration at the Haas School of Business at UC Berkeley, Scientific Director for Energy at the Center for Effective Global Action (CEGA), and Faculty Director of the Energy Institute at Haas. A globally renowned energy economist, Professor Wolfram has published widely on a range of topics, including energy use in the developing world.

What inspired you to take the lead on EEG?

Having studied energy in the United States for over 20 years, I can appreciate how large-scale energy systems are a fundamental input to economic growth. Still, we know relatively little about the mechanisms at play, or how to maximize the benefits of investments in energy infrastructure, especially in low-income regions.

In 2012, I published a paper with Paul Gertler (EEG Deputy Research Director) on energy demand growth in the developing world. We found that energy consumption is projected to almost double in the developing world over the next 25 years, but remain relatively flat in the developed world. We've also noticed that this demand growth has consistently been under-estimated by a significant margin, a trend that has held for the past 15 years (see my recent blog post here). The gap between projections and reality suggests that growth in energy demand may be even larger than we thought, further underscoring the need for better data and evidence to guide decision-making in the energy sector going forward.

Of course, transforming the energy sector in developing countries isn't just a matter of getting the projections right—it's a matter of building robust, efficient and hopefully clean energy systems, using the right mix of resources, setting appropriate prices, promoting regional cooperation, ensuring a supportive regulatory environment, and likely other factors that researchers will uncover through this program.

When the UK's Department for International Development (DFID) announced the opportunity to commission a portfolio of original research on energy and economic growth, I was struck by the daunting complexity—and immense potential—of the undertaking. In partnership with Oxford Policy Management (OPM), we are implementing an approach that is unprecedented in the energy sector, and I think is very promising. I am thrilled to be a part of team that is tackling big questions head-on, and I'm confident knowing we're powered by a network that includes some of the world's top energy researchers, policymakers, and practitioners.

What has the EEG team been up to this year?

We're about one-third of the way through our first year of EEG, which began in April 2016. Right now, we're very focused on co-creating a research agenda that will help us generate high-quality, actionable evidence in later years of the program. To this end, we've recruited over 30 researchers from institutions around the world to author 18 "state-of-knowledge" papers for circulation in spring of 2017.

Additionally, we're in the process of hosting regional policy workshops in Sub-Saharan Africa and South Asia. The workshops are designed to solicit input from the decision-makers who are directly confronting energy-related issues on the ground. In July, we organized a policy workshop in Dar es Salaam, Tanzania, which brought together a diverse group of stakeholders, including energy researchers, policymakers, and public and private sector partners from around East Africa (and beyond). We learned a lot from the conversations we had, and were able to build some important relationships which will help us to ensure our research agenda continues to speak to the needs of policymakers and practitioners. We look forward to hosting a similar workshop in Kathmandu, Nepal in late September.

In early November, our contributing researchers will present their state-of-knowledge papers at a Research & Matchmaking Conference in Washington, D.C. The event will allow policymakers to provide valuable feedback on our developing research agenda, while interacting with key actors from academia and the private sector, and identifying opportunities for collaborative research.

What opportunities are there to get involved in the programme?

The success of EEG depends on the involvement of people who are passionate about energy and economic growth, and willing to confront some really difficult questions. Right now, we are working hard to understand the landscape in which we are operating, and identify the key entry points and opportunities for EEG to make a difference.

In the meantime, we invite you to get involved by signing up for our mailing list and, in some cases, participating in the activities described above. For those of you who are potentially interested in applying for EEG research funding in 2017 and beyond, we encourage you to follow our newsletter and keep an eye on our website (currently under development) for regular updates.

Report on the EEG Policy Workshop in Dar es Salaam

On the 14th July 2016 an EEG policy workshop took place in Dar es Salaam.

This workshop represented a key element of the process of formulating the EEG research agenda in its first year. Its purpose was to gather inputs from policymakers and practitioners, as well as researchers from the East Africa region, about what the key needs for new research are. This contributes to the overall effort, running through the EEG programme, to ensure that the research agenda is 'co-created' by researchers and those in a position to effect change in the design of energy policy and systems.

The workshop brought together 60 participants from four East African countries to discuss the key energy challenges faced in the region, and consider how the EEG programme can help address them. To supplement the learnings from the workshop, the EEG Programme Directorate had a series of meetings with senior energy policymakers, researchers and private sector stakeholders in Dar es Salaam.

An important overall conclusion from the workshop and meetings was that EEG could add significant value to the work of policymakers, private companies and other stakeholders by tackling the substantial research gaps that exist- and supporting the broader process of evidence-based policymaking.

The areas where new research was needed could broadly be summed up in the following themes.

Productive and inclusive uses of electricity

Professor Justin Ntalikwa, Permanent Secretary of the Ministry of Energy and Mineral Resources, confirmed that electricity would be crucial for Tanzania to achieve its goal of becoming a middle-income country by 2025. But several participants emphasised the challenge of ensuring that electricity would contribute to inclusive economic growth- and noted that doing so would require a focus on demand side as well as the supply side. In Tanzania, cases show that investment in rural electricity infrastructure sometimes go under-utilised, which may reflect the prevailing force of other 'binding constraints' to economic growth relating to infrastructure and investment policy for instance. The question raised by choice between different types of electricity was also raised- one important consideration raised by Dr. Margaret Matinga was the differential impacts of different electricity-enabled industries for men and women, and children.

Political economy of energy policy

The matter of how political economy and governance structures shape energy policy was a recurring theme throughout the discussions. The incentives for policymakers to take a short-term perspective on issues which required a long-term approach, and lack of capacity among policymakers to use evidence in the policy process, were raised. An important focus for this discussion was the electricity tariffs set by the regulatory authority and levied by the Tanzania Electric Supply Company (TANESCO): are the tariffs reflective of costs, and what are the methodologies and incentive structures influencing these decisions? There are clearly important questions to be answered relating to the role that political economy plays in shaping energy policy and outcomes- though researchers must be aware of the implications of working in such a highly politicised space.

The role of renewables

Discussions about renewable energy revolved around two themes: the challenges of integrating large-scale renewables into the national electricity grid, and the use of off-grid solar to promote energy access. Mary Susan Abbo, Managing Director of the Centre for Research in Energy and Energy Conservation at Makerere University, suggested that a valuable contribution from EEG could be in sourcing and analysing the data needed to plan for renewables projects. Other participants, including Jan Taneja from IBM Research, raised doubts about the capacity of off-grid systems to power productive uses of electricity given their small size- and prospects for developing off-grid systems in a manner that could eventually link to the grid were discussed.

Reliability of electricity

The lack of reliability of electricity throughout the region, and consequences for productivity, was a topic raised frequently. The potential for predictive maintenance for electricity systems, and isolated distribution generation, as methods for improving grid reliability were discussed. Various opportunities for EEG research emerged, including exploration of how unreliable electricity systems affect productivity, and what the main barriers and solutions for improving reliability.

Data collection and analysis

Throughout the workshop and meetings there was a cry for more accurate data and forecasting on both electricity supply and demand. While there are systems in place to collect data on energy usage, there was concern about their ability to produce accurate data (for instance, whether household meters were read sufficiently regularly to reflect actual usage), and whether that data is used sufficient and appropriately to make decisions. The difficulty of accurate forecasting given the level of suppressed demand in the region, and the rapid changes in consumption patterns and levels, was noted. One solution proposed was undertaking pricing experiments to accurately understand how different tariff structures affected demand.

Participating institutions included:

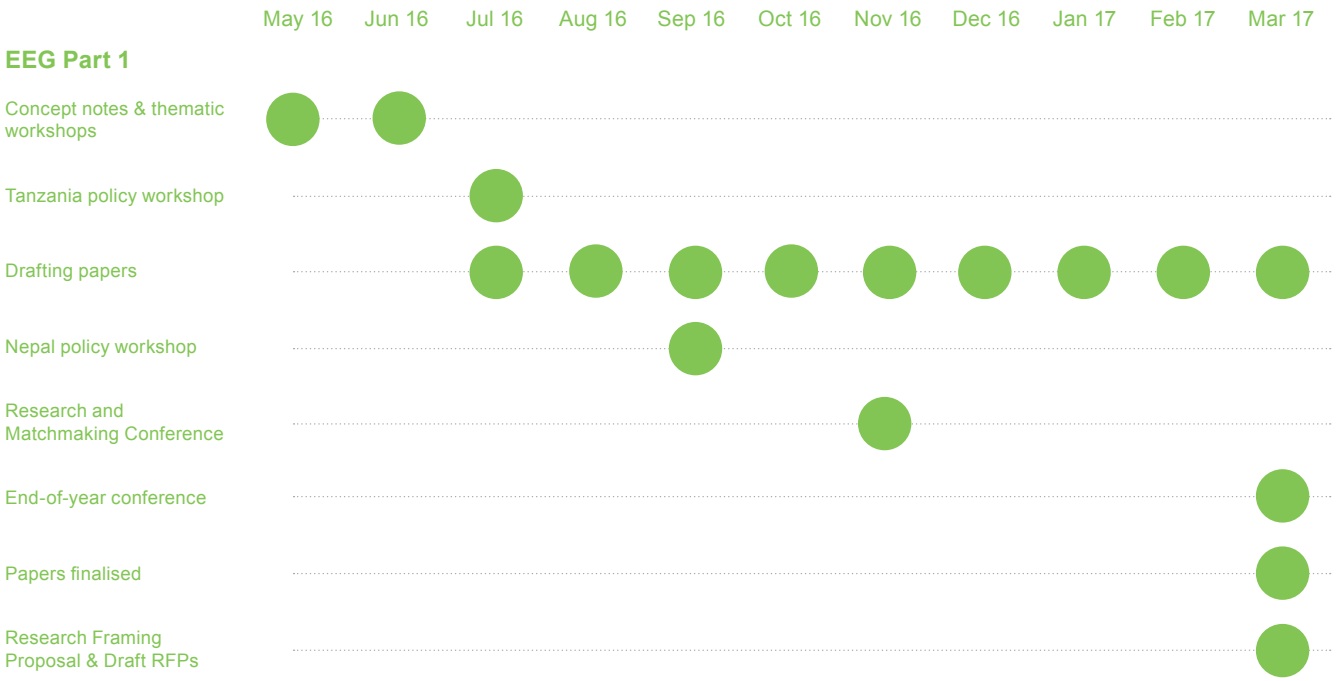
- Government of Tanzania: Ministry of Energy and Minerals, Rural Energy Agency, President's Delivery Bureau, TANESCO, National Development Corporation
- Government of Uganda: Ministry of Energy and Minerals Development
- East African Community
- Private sector: Confederation of Tanzania Industries, Infotech, Off-Grid Electric, IBM Research Africa, Kenya Power, Rift Valley Energy, Photons Energy
- Research and academia : Environment for Development Initiative, Economic and Social Research Foundation (Tanzania), University of Dar es Salaam, REPOA (Tanzania), Makerere University, Economic Policy Research Center (Uganda), University of Oxford, IIED, University of Michigan
- Donors: DFID Tanzania, World Bank, USAID, SNV, GIZ

EEG Themes and Papers in Part 1

This table shows the themes of the EEG programme, theme leads, and the authors and working titles of the State of Knowledge papers being produced during Part 1.

Theme Name and Lead	Paper Authors	Paper Titles
The linkages between electricity supply and economic growth (David Stern, Australian National University)	David Stern (Australian National University) Stephan Bruns (University Kassel) Paul Burke (Australia National University)	The Impact of Energy on Economic Development from a Macro Perspective
	Catherine Wolfram (UC Berkeley) Ted Miguel (UC Berkeley)	Energy and Economic Development: A Microeconomic Research Agenda
	Neil McCulloch (Independent researcher)	Is Electricity Supply a Binding Constraint to Economic Growth in Sub-Saharan Africa and South Asia?
Financial and policy instruments and governance structures that encourage the development and better utilisation of appropriate large scale power infrastructure (Joyashree Roy, Jadavpur University)	Anton Eberhard (University of Cape Town) Duke Ghosh (Global Change Research)	Rethinking Power Sector Reform in Sub-Saharan Africa and South Asia
	Neil McCulloch, John Ward (Vivid Economics), Esmerelda Sindou (OPM)	The Political Economy of Aid for Power Sector Reform
Electricity supply and energy efficiency measures in supporting sustainable urbanisation (Shobhakar Dhakal, Asian Institute of Technology)	Meredith Fowlie (UC Berkeley) Amol Phadke (Lawrence Berkeley National Laboratory)	Energy Efficiency in the Developing World
	Paul Gertler (UC Berkeley) Mushfiq Mobarak (Yale University)	Electricity Supply and Efficiency Measures in Supporting Sustainable Urbanisation
	Harry Smith (Heriot-Watt University)	Urban Governance, Urban Development, Land Use and Energy Access
The constraints in use of large-scale renewable energy sources, or “greener” energy sources (Catherine Mitchell and Bridget Woodman, University of Exeter)	Frank Wolak (Stanford University) Goran Strbac (Imperial College London)	Power Pools and Renewable Deployment
	Bridget Woodman (Exeter University) Catherine Mitchell (Exeter University) Mario Ragwitz (Fraunhofer ISI)	Economic and Non-Economic Barriers and Drivers for the Uptake of Renewables
An improved understanding of the role of extractives in electricity/energy provision and sustainable development (Michael Ross, UCLA)	Michael Ross (UCLA) Paasha Mahdavi (UCLA)	The Political Economy of Hydrocarbon Wealth and Fuel Prices
	Michael Ross (UCLA) Sambit Bhattacharyya (University of Sussex)	What Do We Know about Economic Diversification in Energy-Rich States?
The barriers and opportunities for innovative and appropriate design of larger-scale, centralised energy infrastructure to respond to evolving demand and support inclusive growth (Vijay Modi, Columbia University)	Luis Munuera (International Energy Agency) Simon Mueller (International Energy Agency) Tim Dubbeling (International Energy Agency)	Modular and Discrete? A Review of the Techno-Economics of Temporally and Spatially Scaled Build-Up of Infrastructure in Modern Power Networks
	Vijay Modi (Columbia University)	Reducing Generation, Transmission and Distribution Inefficiencies and the Feasibility of Low Voltage Supply in LICs
	Vijay Modi (Columbia University)	Design Options for Low-Voltage Power Supplies
Cross-cutting theme: Climate Change	Frank Jotzo (Australian National University)	Economic Growth [and Development] with Low-Carbon Energy
Cross-cutting theme: Gender	Harold Wilhite (University of Oslo)	Gender Implications of Energy Use and Energy Access
Cross-cutting theme: Data	Roberta Quadrelli (International Energy Agency) Eric Masanet (International Energy Agency) Duncan Millard (International Energy Agency) Luis Munuera (International Energy Agency)	The Role of Energy Data Systems in Sustainable Development: Challenges and Opportunities

Timeline of EEG activities in Part 1



EEG Part 2

The Applied Research Programme on Energy and Economic Growth will produce valuable evidence and knowledge around the critically under-researched links between energy and economic growth in low-income countries. Funded by UK Aid from the UK Government, EEG is implemented by Oxford Policy Management in partnership with the Center for Effective Global Action and the Energy Institute at Haas, University of California, Berkeley. Activities in Part 1 of the programme (April 2016-April 2017) will lay the ground for a research agenda to guide Part 2, up to 2021. Part 2 will see the commissioning of original research occurring in parallel with policy engagement activities. The latter will ensure that the research responds to and is utilised by those whose decisions are central to determining the relationship between energy and economic growth.

We would be to glad to receive any feedback on the newsletter, relating to content, length and format- please send this to eeg@opml.co.uk.

EEG Programme Directorate

Marcela Tarazona (OPM), Programme Director
Catherine Wolfram (UC Berkeley), Research Director
Paul Gertler (UC Berkeley), Deputy Research Director

UKaid
from the British people

Oxford Policy Management

Stay in touch

If you would like more information about theApplied Research Programme on Energy and Economic Growth please contact: Felicity Le Quesne, EEG Programme Manager. Email: **felicity.lequesne@opml.co.uk**

Sign up for EEG programme updates at: **eepurl.com/bX1kpP**