

ESMAP Knowledge Exchange Forum:

Strengthening Energy Systems in a Time of Technology Disruption

WESTMINSTER CONFERENCE CENTRE | LONDON, ENGLAND | NOVEMBER 29–DECEMBER 1, 2017



HOSTED BY THE UK DEPARTMENT FOR INTERNATIONAL DEVELOPMENT (DFID) AND
THE UK DEPARTMENT FOR BUSINESS, ENERGY & INDUSTRIAL STRATEGY (BEIS)



ESMAP'S MISSION

The financial and technical support by the Energy Sector Management Assistance Program (ESMAP) is gratefully acknowledged. ESMAP—a global knowledge and technical assistance program administered by the World Bank—assists low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Denmark, the European Commission, Finland, France, Germany, Iceland, Italy, Japan, Lithuania, Luxembourg, the Netherlands, Norway, the Rockefeller Foundation, Sweden, Switzerland, the United Kingdom, and the World Bank.

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We would like to welcome you to London and to the 2017 ESMAP Knowledge Exchange Forum on Strengthening Energy Systems in a Time of Technology Disruption.

The event is organized by the World Bank [Energy Sector Management Assistance Program \(ESMAP\)](#) and hosted by the [UK Department for International Development \(DFID\)](#) and the [UK Department for Business, Energy and Industrial Strategy \(BEIS\)](#).

The 2017 ESMAP Knowledge Exchange Forum is meant to be a venue for the exchange of knowledge, experiences, lessons and insights among practitioners. The Forum will bring together participants from many World Bank client countries and developed countries. Practitioners from international financial organizations are also expected to participate.

As technological disruption is spreading from developed to developing countries, the transformation of the power sector is poised to be a key theme for most developing countries in their journey towards achieving Sustainable Development Goal (SDG) 7. In the 2017 London Knowledge Exchange Forum, we ask: What is the future of the energy systems in a time of technology disruption—and how must developing countries seek to adapt?

Declining costs of renewables and improvements in communications, information and energy technologies present new opportunities for developing countries. These include deploying and integrating variable renewable energy resources and distributed energy resources into the power system, enabling demand side response and energy efficiency, and extending modern electricity services to unserved areas—all of which are key to achieving the SDG 7.

With surging investments in renewables and new technology costs declining, low-and-medium income countries stand on the threshold of a revolution. Similar developments are already unfolding across the power systems of many developed economies: new business models and services are emerging



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with the promise of cheaper, greener and smarter electricity, often delivered by new private sector participants. Exploiting the potential benefits brought by new technologies, however, might be at odds with the business models of the sector. Under this paradigm, transmission, distribution and generation companies must either transform themselves to adapt to a new reality of rapid technological changes or fight an increasingly difficult battle to preserve their traditional role.

Power systems in developing countries face unique challenges to this transition across the physical system, markets and governance domains. Lack of physical infrastructure to support the integration of new technologies; regulatory frameworks that provide inadequate incentives for utilities to improve their performance and do not open up for private sector participation and market based solutions; and weak institutions incapable of changing the status quo. These are some of the insights, knowledge, and lessons learned all participants will hear and share about.

The day will be devoted to discuss strengthening energy systems in a time of technology disruption, but we believe participants' experiences and contributions to the discussions will be highly relevant and interesting to all attending the event.

The [KEF](#) will shed light on this through 6 sessions spanning over two days:

1. Introductory Plenary: Visions of the Evolution of Energy Systems
2. How will the role of utilities in the future energy system evolve?
3. How innovative off-grid initiatives and improved planning tools are improving access in developing countries
4. What are the challenges and opportunities of mobilizing commercial capital due to new energy systems?
5. How market-based solutions can unlock power system flexibility through stronger price signals
6. How can development partners work with national governments to enable the transition to the energy systems of the future? (Closing session)

It is our goal that you find the event interesting and insightful!





ESMAP Knowledge Exchange Forum: Strengthening Energy Systems in a Time of Technology Disruption

WESTMINSTER CONFERENCE CENTRE | 1 VICTORIA STREET | LONDON, SW1H 0ET

TIME	DAY 1 WEDNESDAY NOVEMBER 29
12:00	Registration and lunch
13:30	Opening Addresses <ul style="list-style-type: none"> • The Rt Hon Lord Bates, UK Minister of State for International Development • Ranjit Lamech, Director, World Bank Energy and Extractives Global Practice
Session 1 Key Note Visions of the Evolution of Energy Systems	
14:00	<p><i>With technology and markets changing rapidly—and longstanding business models with them—what does the future energy system look like and what are the opportunities and challenges for developing countries?</i></p> <p>Introduction:</p> <ul style="list-style-type: none"> • Rohit Khanna, Practice Manager, ESMAP • Dr. Robert Stoner, Deputy Director of the MIT Energy Initiative and Director of the Tata Center for Technology and Design
15:00	Refreshments & Networking

TIME	DAY 1 WEDNESDAY NOVEMBER
(Continued)	
Session 2 How Will the Role of Utilities in the Future Energy System Evolve?	
16:00	<p>Moderator Vivien Foster, Lead Energy Economist, World Bank</p> <p><i>The growth of distributed energy resources, the amalgamation of consumers and producers into prosumers, and new remote data and control possibilities are unlocking innovative ways of providing and charging for energy services. What business models are currently emerging and how will the traditional utility adapt?</i></p> <p>Introductory Remarks</p> <ul style="list-style-type: none"> • Vivien Foster, Lead Energy Economist, World Bank Overview of the evolution and future of the utility sector including preliminary insights from ongoing World Bank research. <p>Breakout Session 1 “Smart” Delivery On- and Off-Grid</p> <p>Moderator Sheoli Pargal, ESMAP Lead Energy Economist</p> <p>From Traditional Discom to a “Smart” Utility How distributed energy resources are affecting utilities in developing countries and what utilities are doing to transform.</p> <ul style="list-style-type: none"> • Praveer Sinha, CEO of TATA Power Delhi Distribution Ltd <p>An Emerging Distance Model How BBOX provides an alternative to grid extensions, how its emerging distance model is adapting lessons drawn from utilities, and the benefits and drawbacks of this approach.</p> <ul style="list-style-type: none"> • Christopher Baker Brian, (CTO) and Co-Founder, BBOX <p>Breakout Session 2 Drivers of Evolution for Utilities</p> <p>Moderator Vivien Foster, Lead Energy Economist, World Bank</p> <p>The Utility of the Future in Developing Countries Early results from Massachusetts Institute of Technology’s Utility of the Future Phase II study focused on was developing countries and sponsored by the Shell Foundation.</p> <ul style="list-style-type: none"> • Pradeep Pursnani, COO, Shell Foundation <p>Adapting Regulatory Models to Drive Innovation The UK’s experience in embracing technological change.</p> <ul style="list-style-type: none"> • Martin Crouch, Senior Partner, Ofgem
RECEPTION HOSTED BY THE SHELL FOUNDATION	
18:00 20:00	<p>Location Belvedere Road Waterloo SE1 7NA</p> <p>Evening drinks reception hosted by Shell Foundation at Shell Centre, South Bank, London.</p> <p>Highlights by Shell Foundation, DFID, and World Bank.</p>

TIME	DAY 2 THURSDAY NOVEMBER 30
<p style="text-align: center;">Session 3 How Innovative Off-Grid Initiatives and Improved Planning Tools are Improving Access in Developing Countries</p>	
09:00	<p>Moderator William Blyth, DFID</p> <p><i>Technological developments, innovative payment schemes, and better data and tools are making off-grid solutions a viable and cost-effective way of reaching the last mile. Global initiatives such as Power for All, Lighting Global, and the roll-out of geospatial planning tools has increased the reach of off-grid solutions, in particular in Africa. How can developing countries develop an enabling environment for off-grid solutions, what are the positive impacts experienced by local communities, and how can the World Bank and other development organizations provide tools and knowledge to help improve system-wide planning in order for off-grid solutions to play a full and cost-effective role?</i></p> <p>The Challenges of Developing an Enabling Environment for Off-Grid Development How the Sierra Leone Energy Revolution, supported through the Power for All Initiative, is transforming energy services in Sierra Leone.</p> <ul style="list-style-type: none"> • Sophie Johnson, President, Renewable Energy Association of Sierra Leone (REASL) <p>Off Grid Electrification in Myanmar How Myanmar's National Electrification Plan is expanding modern solar home systems, mini-grids, and other off-grid approaches to bring electricity to rural and remote communities.</p> <ul style="list-style-type: none"> • U Khant Zaw, Director General, Department of Rural Development, Myanmar <p>The Evolution of Off-Grid Business Models and How to Build Environments They can Thrive in Innovative business models allow us to provide energy access to millions of people today. Their impact goes beyond energy access with pay-as-you-go operators providing services beyond electricity. How have these business models evolved? And how can we provide an enabling environment in which they can truly scale and reach hundreds of millions of households?</p> <ul style="list-style-type: none"> • Johanna Diecker, Director of Policy, GOGLA <p>The Rise of Geospatial Planning in Developing Countries How new tools and better data can guide cost-effective investments to improve energy access in developing countries.</p> <ul style="list-style-type: none"> • Yann Tanvez, Energy Specialist, ESMAP
10:30	Refreshments & Networking

TIME	DAY 2 THURSDAY NOVEMBER 30
(Continued)	
Session 4 What are the Challenges and Opportunities of Mobilizing Commercial Capital Due to Changes in Energy Systems?	
11:15	<p>Moderator Phil Stevens, Head of Investment Team, DFID</p> <p><i>Power systems across the world are facing massive investment needs in the coming decades in order to meet the Sustainable Development Goal of ensuring access to affordable, reliable, sustainable and modern energy for all. The only way to achieve the goal is to mobilize commercial capital at unforeseen scale—to leverage billions of dollars of concessional lending with trillions of dollars of private resources.</i></p> <p>The Scaling Solar Approach towards Mobilizing Commercial Capital for Solar Investments—the Case of Zambia Scaling Solar aims to create viable markets for solar power and make privately funded grid-connected solar projects operational within a short timeframe and at competitive tariffs. How can the World Bank and other developing partners collaborate with IFC to build an enabling environment?</p> <ul style="list-style-type: none"> • Alasdair Miller, Senior Energy Specialist, International Finance Corporation (IFC) <p>The World Bank’s “Cascade” Approach to Mobilizing Commercial Capital: The Infrastructure Sector Assessment Program (InfraSAP) How the WBG and client governments can improve the enabling environment to mobilize commercial capital through a systematic and structured sectoral diagnostic that identifies improvements in sector performance and barriers to investment, and preview of results for the Vietnam Energy INFRASAP.</p> <ul style="list-style-type: none"> • Vivien Foster, Lead Energy Specialist, World Bank <p>Support for Local Currency Finance for Infrastructure Projects How Private Infrastructure Development Group’s GuarantCo scheme support local currency finance in low-income countries, promoting domestic infrastructure financing and capital market development.</p> <ul style="list-style-type: none"> • Phil Skinner, Senior Investment Officer, GuarantCo <p>Chilean Experiences Leveraging Private Capital for Renewable Energy How Chile has leveraged private sector investments in renewable energy generation through their successful renewable energy auctions.</p> <ul style="list-style-type: none"> • Cristian Luhr, Head of Electricity Tenders Unit, Comisión Nacional de Energía, Chile
12:45	Lunch

Session 5

How Market-Based Solutions Can Unlock Power System Flexibility through Stronger Price Signals

14:15 **Moderator** | **Debrabata Chattopadhyay**, Senior Energy Specialist, World Bank

The growth of renewable energy generation increases the value of flexibility in the power system and puts system operators to the test in mobilizing flexible resources to balance the grid. How can market mechanism be used to incentivize and unleash active demand side participation and increased flexibility from existing generation assets, in a sector characterized by baseload generation and long term PPA lock-ins?

Demand-Side Innovations in Brazil | Learning from experience and achievements on demand side response in Brazil.

- **Camila Schoti**, Director of Energy, ABRACE – Associação Brasileira de Grandes Consumidores Industriais de Energia e de Consumidores Livres

Demand-Side Management Options at the System Operator Level | The growing role of demand response in providing flexibility to help National Grid balance Britain's electricity system in a cost-effective manner.

- **Adam Sims**, SO Flexibility Manager, National Grid

Creating Markets to Increase Demand Side Flexibility | How aggregators can help price signals reach end-consumer and unleash important demand side flexibility.

- **Yoav Zingher**, CEO of KiwiPower

15:15 **Refreshments & Networking**

DAY 2 | THURSDAY NOVEMBER 30

(Continued)

Session 6

How Can Development Partners Work with National Governments to Enable the Transition to the Energy Systems of the Future? (Closing Session)

16:15 **Moderator | Ranjit Lamech**, Director, Energy and Extractives Global Practice, World Bank
How can various donor-led support programs and financing instruments add up to transform power systems and create an enabling environment for new services? What can be done to increase the efficiency of development partner support to governments and utilities?

Participants

- **Chris Chijiutomi**, Investment Director, CDC Group
- **Peter Hilliges**, Head of Division and Climate Policy Coordinator, Competence Centre Climate and Energy, KfW Development Bank
- **Steve Beel**, Country Lead, Cities Infrastructure for Growth Programme, DFID Zambia
- **Daw Mi Mi Khaing**, Director General, Department of Electric Power Planning, Myanmar
- **Sophie Johnson**, President, Renewable Energy Association of Sierra Leone (REASL)
- **Cristian Luhr**, Head of Electricity Tenders Unit, Comisión Nacional de Energía, Chile
- **Camila Schoti**, Director of Energy, ABRACE, Brazil

17:15 **Closing Remarks**

- **Melinda Bohannon**, Deputy Director and Head of Department for Growth and Resilience DFID
- **Pete Betts**, Director of International Climate and Energy, BEIS
- **Rohit Khanna**, Practice Manager, ESMAP

DAY 3 | FRIDAY DECEMBER 1 | FIELD VISITS

**08:30
13:30** **Participants have the option to sign up and participate in one of two site visits.**

- **Option 1* | National Grid.** Visit to control room.
- **Option 2* | Thames Water.** Queen Elizabeth II Reservoir floating solar PV plant.

Participants will have a chance to get off at Heathrow Airport on the way back from the field trip. The final stop will be the Club Quarters Hotel.

* See detailed fieldtrip description on the next page.

Friday December 1 | Field Visits

Option 1 | Visit to the National Grid Control Centre

Departure Time	8:30am from Club Quarters Hotel at Trafalgar Square, 8 Northumberland Avenue, London, WC2N 5BY, UK
Address	St. Catherine's Lodge, National Grid Control Centre, Bearwood Road, Sindlesham, Nr Wokingham, Berkshire, United Kingdom RG41 5BN
Capacity	30 REGISTRATION LINK

National Grid owns and operates the high-voltage electricity transmission system in England and Wales comprising more than 7,200 kilometers of overhead line, about 690 kilometers of underground cable and 337 substations at 241 sites. The Control Centre in Wokingham is tasked with the day-to-day operation of the Great Britain electricity transmission system, which involves the continuous real-time matching of demand and generation output to ensure the stability and security of the power system and the maintenance of satisfactory voltage and frequency.

The site visit will focus on how the role of National Grid, as the System Operator in Great Britain, is adapting to manage the changes large increase in renewable energy generation and changing energy demand. National Grid will show how demand side flexibility and improved forecasting of variable renewable energy generation help the control centre maintain system frequency.



Option 2 | Visit to Thames Water

Europe's Largest Floating Solar PV Project on the Queen Elizabeth II (QEII) Reservoir in Greater London

Departure Time	8:30am from Club Quarters Hotel at Trafalgar Square, 8 Northumberland Avenue, London, WC2N 5BY, UK
Address	Walton-on-Thames WTW, Hurst Road, Surrey, KT12 2EG Click Here To View Map
Capacity	25 REGISTRATION LINK

Thames Water has installed Europe's largest floating solar PV plant on the normally unusable suburban space on the surface of the Queen Elizabeth II reservoir outside London. With total installed peak capacity of 6.3 megawatts, the innovative floating solar PV installation generates around 5.8 million kilowatt hours of electricity annually—enough to cover the annual consumption of around 1,800 British homes—and will help power Thames Water's nearby water treatment works. With more than 23,000 floating solar photovoltaic (PV) panels mounted on 61,720 individual floats, the floating solar PV plant takes up approximately 9% of the reservoir—equivalent to the size of eight large football pitches.

Thames Water is the UK's largest water and wastewater services provider. The privately-owned utility supply around 2,600 million liters of tap water to 9 million customers across London and the Thames Valley and provide sewage services to 15 million customers. Thames Water generate renewable energy from Combined Heat and Power (CHP), sewage sludge incineration, solar power, wind power and hydropower and aim to self-generate a third of its own energy consumption by 2020.

During the visit, Thames Water will present how PV contributes to the company's ambitious energy strategy. There will also be an opportunity to see the floating solar PV Plant and Lightsource, who will present the key technical and commercial aspects of the floating solar PV system.



Bios

OPENING ADDRESSES



Lord Bates
UK Minister of State for International Development

Lord Bates was appointed as a Minister of State at the Department for International Development on Friday 14 October 2016. He was previously a Minister of State at the Home Office from May 2015 until March 2016. Lord Bates is a Conservative member of the House of Lords, and the Lords' Spokesperson for Her Majesty's Treasury.

Lord Bates has an MBA degree from Said Business School, University of Oxford. He worked, with others, to establish one of the first City Technology Colleges in Gateshead dedicated to delivering academic excellence in a socially deprived area of Tyneside. He has served as Director of Research & Consulting for Oxford Analytica – an international consulting firm using a network of academics for Oxford and universities around the world to undertake research in economic, business and political trends.

He joined the Conservative Party in 1979. In 2008 he was appointed to the House of Lords. Between 2008 and 2010 he held a number of Shadow Ministerial posts including: Communities and Local Government, Cabinet Office and the Whips' Office. In 2013 he was appointed a Deputy Speaker and Deputy Chairman of the House of Lords. He was appointed Parliamentary Under Secretary of State for Criminal Information at the Home Office in 2014; the Lords spokesman and Whip at the Department for Work and Pensions; and the Whip at the Department for International Development.

In 2011 he embarked on a solo 3,000 mile walk from Olympia in Greece to London to raise awareness for the Olympic Truce.



Mr. Ranjit Lamech
Director, Energy and Extractives Global Practice, World Bank

Ranjit Lamech is Director of the World Bank Energy and Extractives Global Practice where he leads investments and advisory engagements in the East Asia and Pacific, South Asia, and Europe and Central Asia Regions. He is an energy expert with close to three decades of experience in financing projects and advising governments, energy utilities and private sector partners on energy security, energy efficiency, regional energy trade and reforms. Mr. Lamech has held technical and leadership roles across the World Bank's energy practice, most recently as the Energy Practice Manager covering the countries of South and Central Europe, Western Balkans and Central Asia.

In the 1990s and early 2000s, he led the Bank's energy lending and advisory program in China and Turkey during a transformational period of energy market reforms, diversified ownerships and a shift to cleaner energy sources.

Mr. Lamech, an Indian citizen based in Washington, D.C., began his career in 1986 with the Tata Electric Companies in Bombay, India.

He has an MS in Mechanical Engineering from Stanford University (1986), an MPA from the Kennedy School of Government at Harvard University (1992), and the International Tax Program Certificate from Harvard Law School (1992).

SESSION 1 | INTRODUCTORY PLENARY VISIONS OF THE EVOLUTION OF ENERGY SYSTEMS

INTRODUCTION



Mr. Rohit Khanna
Practice Manager, Energy Sector Management Assistance Program (ESMAP), World Bank

Rohit oversees a portfolio of analytical and advisory activities to inform the energy sector policy dialogue. Under his direction, ESMAP has grown exponentially to support over 250 activities in more than 130 countries; influence World Bank, IDA, and IBRD financing; and leverage billions from global partners to support the growth of and strengthen the design and implementation of investment projects in the sector.

Rohit joined The World Bank in 2000, and prior to assuming his current position at ESMAP, he worked on the Global Environment Facility (GEF) and Clean Technology Fund (CTF) at the World Bank. Before joining the World Bank, he was a Program Officer in the UN Environment Program, and worked for Save the Children Fund in its Bhutan Field Office.



Dr. Robert Stoner
Deputy Director of the MIT Energy Initiative and
Director of the Tata Center for Technology and Design

Robert Stoner is the Deputy Director for Science and Technology of the MIT Energy Initiative, and Founding Director of the MIT Tata Center for Technology and Design. He is currently member of the MIT Energy Council, the Science and Technology Committee of the Alliance for Sustainable Energy which oversees the U.S. National Renewable Energy Laboratory, and the Technical Advisory Board of the India-based Center for the Study of Science, Technology and Energy Policy.

His current research interests include energy technology and policy for developing countries, and optimization and design for resource constrained settings, and he is the co-leader of the MIT Universal Energy Access Group. He earned his Bachelor's degree in engineering physics from Queen's University, and his Ph.D. from Brown University in condensed matter physics.

SESSION 2 | HOW WILL THE ROLE OF UTILITIES IN THE FUTURE ENERGY SYSTEM EVOLVE?



Moderator and Introductory Remark | Ms. Vivien Foster
Lead Energy Economist, World Bank

Vivien, a British national, joined the Bank in 1999 as a Young Professional. She previously worked as a Managing Consultant of Oxford Economic Research Associates Ltd in the UK, advising private and public sector clients in the water and energy industries, both in Europe and Latin America, focusing particularly on the economic regulation of utilities. She holds a Doctorate in Economics from University College London.

At the Bank, she worked as a Senior Economist in the Latin America Region and Lead Economist in the Africa Region, leading a wide range of analytical, operational and corporate engagements; often cutting across infrastructure sectors and working on the macroeconomic and fiscal interface. In particular, she led the Africa Infrastructure Country Diagnostic a path-breaking knowledge program that covered 40 African countries and produced a large suite of influential analytical reports. She was lead author of "Building Bridges" an innovative analysis of the Chinese role in Africa's infrastructure development, as well as "Water, Electricity and the Poor" focusing on the design of tariffs and subsidies to preserve affordability of services to the poor.

Since 2012, Vivien has been Sector Manager for the Energy Anchor, and subsequently Practice Manager Strategy & Operations for the new Global Practice. She was a core member of the team that developed and secured Board consensus for the Energy Sector Directions Paper in 2013. She positioned the Bank as a Knowledge Hub for the Sustainable Energy for All initiative developing a program of data-driven flagship global knowledge products, including the Global Tracking Framework and Readiness for Investment in Sustainable Energy, in collaboration with numerous external agencies. She promoted knowledge management in the practice through the establishment of two new Communities of Practice for Energy Efficiency and Energy Access, and created the Live Wire series of knowledge notes as a fast track for sharing and disseminating knowledge.

In 2015, Vivien was appointed Global Lead for Energy Economics, Markets & Institutions.



Moderator: Ms. Sheoli Pargal
Lead Energy Economist, Energy Sector Management Assistance Program (ESMAP), World Bank

Sheoli Pargal is a Lead Economist with ESMAP in the World Bank's Global Practice for Energy and Extractives. She has worked across infrastructure sectors in a range of areas including governance, regulation, public-private partnerships, power and energy, and industrial pollution.

In over twenty years at the World Bank she has worked in the Bank's research department; on Latin America, the Middle East, and South Asia; and in corporate policy and operations units. She has also worked in the Planning Commission in India in the Secretariat for the Prime Minister's Committee on Infrastructure. Ms. Pargal has a Ph.D in Economics from Northwestern University.



Mr. Praveer Sinha
CEO of TATA Power Delhi Distribution Ltd

Praveer Sinha is the CEO & Managing Director of Tata Power-DDL. He has nearly 34 years of experience in the generation and distribution sector and has been responsible for developing and setting up greenfield and brownfield power plants in India and abroad and bringing in socio economic reforms in Distribution Sector.

Mr. Sinha is chairman and director of the Smart Utilities Group and member of prominent committees for reforms in the power sector and prominent Indian education institutions. He has been awarded for his outstanding contribution in the sector by the Central Board of Irrigation and Power. Mr. Sinha holds a Master's Degree in Business Law from National Law School, Bengaluru and is also professionally trained as an electrical engineer. He is presently a research scholar at Indian Institute of Technology, New Delhi and also a visiting scholar at Massachusetts Institute of Technology.



Mr. Christopher Baker-Brian
Chief Technology Officer and co-founder of BBOXX

Chris Baker-Brian is co-founder and Chief Technology Officer of BBOXX, a venture backed company developing solutions to provide affordable, clean energy to off-grid communities in the developing world. Founded in 2010 by Chris and two fellow Imperial College London students, the company has enjoyed fast growth; BBOXX has now deployed more than 150,000 solar kits and impacted over 750,000 lives across Africa and Asia. The company now employs over 1000 full and part time staff in seven countries around the world. Investors include Kholsa Impact, Synergy Growth, Bamboo Finance, Ceniarth, ENGIE, MKB&CO and DOEN.

As the CTO, Chris leads the development, from the London office, of a wide range of advanced rural electrification solutions, as well as a range of software products to support BBOXX's growing global operations.

Christopher is a graduate of Imperial College London. He co-founded BBOXX in 2010 to commercialise the technology and help cater for a growing demand for affordable energy products and services in developing countries. Christopher is responsible for product development, supply chain and BBOXX's manufacturing and technology partnerships and leads its 30 person strong technology team in London. He also oversees the development of BBOXX's supply-chain in China.



Mr. Pradeep Pursnani
Deputy Director, COO Shell Foundation

Pradeep joined Shell Foundation in early 2010 to run the organisation's expanding clean cookstoves programme, following three years in Strategy and Portfolio for Shell Group. In 2012, he became Deputy Director (COO) with responsibility for operational management of all programmes and strategy development for Shell Foundation's future investments.

Through previous roles Pradeep has built extensive experience working and scaling start-up enterprises and in defining corporate strategy for major multinationals. A Chartered Management Accountant, Pradeep also has a degree in International Business Management and a passion for entrepreneurialism and social development.



Mr. Martin Crouch
Senior Partner, Ofgem

Martin Crouch is Senior Partner, Improving Regulation. His current responsibilities include supporting Ofgem's regulatory policy development through central teams covering economics, enforcement and innovation.

Martin joined Ofgem in 2003 and has led teams responsible for electricity distribution, European markets, renewable and energy efficiency support schemes and electricity transmission, including interconnector development and offshore tenders. From 2012 until early 2015, he chaired the Electricity Working Groups of the European regulatory bodies CEER and ACER.

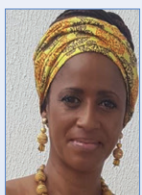
SESSION 3 | HOW INNOVATIVE OFF-GRID INITIATIVES AND IMPROVED PLANNING TOOLS ARE IMPROVING ACCESS IN DEVELOPING COUNTRIES



Moderator: Dr. William Blyth
DFID

William Blyth has worked for over 20 years in the analysis of energy security, climate change and sustainable development. He works part-time as a Senior Research Fellow at DFID. In addition he holds Associate Fellow positions supporting research on sustainable energy issues at Chatham House and Imperial College London, and is Director of Oxford Energy Associates.

He is an expert in energy sector economics & policies specialising in transitions to a low-carbon economy and energy access in developed and developing countries. William previously worked at the International Energy Agency in Paris, the European Environment Agency in Copenhagen and for AEA Technology Environment. He has a DPhil in Physics from Oxford University.



Ms. Sophie Johnson
President, Renewable Energy Association of Sierra Leone (REASL)

The founding UK & Sierra Leone Director of Solar Era Holdings SL LTD and Africa Growth & Energy Solutions (AGES) UK PLC, a Micro Multi-National Company. Currently working on developing renewable energy projects across West and Central Africa. Sophie is committed to providing renewable energy solutions through national and International partnerships collaboration. Sophie has a wealth of extensive business & project management experience within the Public and Private Sector, delivering quality services within auditable resources. Sophie possesses excellent negotiating skills and a demonstrated ability to build relationships and clear passion for distributed renewable energy.

Sophie was appointed as the first President of the Renewable Energy Association of Sierra Leone taking the lead on all Government policy initiatives, Donor and Stakeholder engagements on behalf of the Association by providing advice on business and commercial activities within the sector.

Sophie is passionate about and advocates for the welfare of girls by being an active board member on several professional Health, Children and Social Care organisations within Sierra Leone.



Mr. Khant Zaw
Director General, Department of Rural Development, Ministry of Agriculture, Livestock and Irrigation, Myanmar

Mr. Khant Zaw is the Director General of the Department of Rural Development under the Ministry of Agriculture, Livestock and Irrigation. In his former roles, he was the Director of Department of Development Affairs under the Ministry for Progress of Border Areas and National Races and Development Affairs. Mr. Zaw also worked as a Director of the Department of Rural Development under the Ministry of Border Affairs. As well as Deputy Chief Engineer, Department of Rural Development under the Ministry of Livestock, Fisheries and Rural Development.

In his current position, his role and expertise within the Ministry is to: Monitor, Manage and control all sectors under Rural Development, and coordinate with international development organizations for the rural regions for the entire country. Mr. Zaw holds a Bachelor of Engineering (Civil) from Yangon Institute of Technology.



Ms. Johanna Diecker
Director of Policy, GOGLA

Johanna joined GOGLA as the first employee back in 2013, then holding the position of operations and project manager. Between 2015 and 2017 she was in charge of the enabling environment program, aiming to establish a conducive policy environment catalyzing market development for GOGLA members. As the Policy Director, Johanna drives the continuous development and improvement of policy & advocacy strategies. This includes the management of GOGLA's work on enabling environment, standards and guidelines, and the association's regional representation.

Prior to joining GOGLA, Johanna worked for the GIZ where she was actively involved in the provision of advisory services to the German Federal Ministry for Economic Development and Cooperation regarding ICT4D. She holds Bachelor degrees in Development Studies and Political Science, as well as a Master degree in Political Science from the University of Vienna.



Mr. Yann Tanvez

Energy Sector Management Assistance Program (ESMAP), World Bank

Since joining the Bank in 2012 Yann has been focusing on public sector innovations and private sector development strategies supporting energy access and clean energy scale-up globally. Yann also currently leads the practice work on open data and analytics aiming at leveraging data innovations towards accelerating progress towards universal access to affordable, reliable, sustainable and modern energy.

Prior to joining the World Bank Group, Yann held various positions in the private and non-governmental sectors, including as advisor to CEOs and Executive Committees of major global energy companies. French national, Yann holds bachelor and master degrees in law from Lyon III University, a BA in classic philosophy from Paris I Sorbonne University as well as a MA in international affairs from the Institut d'Etudes Politiques of Paris—Sciences Po.

SESSION 4 | WHAT ARE THE CHALLENGES AND OPPORTUNITIES OF MOBILIZING COMMERCIAL CAPITAL DUE TO CHANGES IN ENERGY SYSTEMS?



Moderator | Mr. Phil Stevens

Head of Investment Team, DFID

Phil Stevens leads DFID's Private Sector Investment Team, which is responsible for overseeing the UK government's investment in CDC Group as well as efforts to mobilize institutional investment in developing countries. Prior to taking on this role in August 2017, Phil spent eight years living and working overseas - three in Washington DC representing the UK at the IMF and World Bank Group Boards, three in the Democratic Republic of Congo supporting the delivery DFID's bilateral aid projects, and two working for the Government of Malawi as an adviser in their Ministry of Trade and Industry. Phil also has experience of working elsewhere in Whitehall for HM Treasury and the Ministry of Defence.



Mr. Alasdair Miller

Sr. Energy Specialist, International Finance Corporation (IFC)

Alasdair Miller is a Senior Energy Specialist with IFC Advisory. He is an engineer by background with extensive experience in the development and implementation of utility scale solar and wind projects in developing countries.

As the IFC's technical lead on the Scaling Solar program he is currently working on the development of over 1 GW of solar PV capacity in Ethiopia, Zambia, Senegal and Madagascar.



Ms. Vivien Foster

Lead Energy Economist, World Bank

Please see bio, page 12.



Mr. Phil Skinner

Senior Investment Officer, GuarantCo

Phil is a Senior Investment Officer with GuarantCo responsible for originating, structuring and executing transactions. GuarantCo encourages infrastructure development in low-income countries through the provision of credit guarantees that enable infrastructure projects to raise debt finance. In particular, GuarantCo seeks to mobilise local currency debt to mitigate the FX risks many hard currency financed projects are typically exposed to. Prior to joining GuarantCo, Phil worked for the Green Investment Bank and DNB Bank where he specialised in power and renewable energy transactions. Phil holds a MSc in Development Economics from Oxford University.



Mr. Cristian Lühr

Head of Electricity Tenders Unit, Comisión Nacional de Energía (CNE), Chile

Cristian Lühr has been head of the Energy Tenders Unit since 2015. He is in charge of developing the regulatory framework and the design of the energy tender processes, key to securing efficient and sustainable energy in the long term. The success in these tenders has led Chile to obtain record-low energy prices, and become a leading country in competitiveness and energy investment in the region. Cristian was formerly with CNE where he was responsible for the Nodal Average Price decrees that sets the rates for Chile's regulated customers. Earlier in his career, he worked in the National Energy Commission (CNE) as well, this time contributing to several of the main tariff setting processes, such as the added value of distribution (VAD), the modeling of sub-transmission systems, and the nodal price fixing process.

He studied Electrical-Industrial Engineering at the Catholic University of Chile. In 2007 he obtained the "President of the Republic" scholarship, through which he completed a "Master in Advanced Studies in Economics," at Pompeu Fabra University, Barcelona.

SESSION 5 | HOW MARKET-BASED SOLUTIONS CAN UNLOCK POWER SYSTEM FLEXIBILITY THROUGH STRONGER PRICE SIGNALS



Moderator | Mr. Debabrata Chattopadhyay

Senior Energy Specialist, World Bank

Deb is a power system engineer who leads the power systems planning group in the World Bank. Deb has been in a full-time consulting role from 2000-2012 as a Director with Charles River Associates (2000-2009) and Deloitte Australia.

He was an Associate Professor at University of Canterbury until late 2000, and is currently an Adjunct Professor of Electrical Engineering (Power System) at the University of Queensland and University of Melbourne (Australia).



Ms. Camila Schoti

Director of Energy, ABRACE – Associação Brasileira de Grandes Consumidores Industriais de Energia e de Consumidores Livres, Brazil

Camila Schoti is Energy Director at ABRACE - Brazilian Association of Large Industrial Energy Consumers and Free Consumers where she leads the teams that are responsible for proposing new public policies and regulation related to electricity and natural gas markets.

Leading the technical areas of the association, her main goal is contributing to improve market conditions to promote competitiveness for energy and natural gas prices and tariffs. She is also a member of the Federal Government's Energy Efficiency Steering Committee, a member of the Federal Government's "Gás para Crescer" Technical Committee ("Gas to Grow Initiative"), a Coordinator at the Forum of Business Associations Pro-Development of the Natural Gas Market and representative of ABRACE at the Forum of the Brazilian Electric Sector Associations.

Camila has a Master degree in Economics from the University of Brasília with academic experiences at INSEAD, France, Harvard University, USA, and Florence School of Regulation, European University Institute, Italy.



Mr. Adam Sims

SO Flexibility Manager, National Grid

Adam Sims started his career in 1999 as a network analyst on the gas transmission system in Great Britain. Since then he has worked on gas regulation and electricity transmission charging before managing a team working on the development and contracting of balancing services. He was responsible for developing the recent Enhanced Frequency Response tender in which 201MW of new battery assets were successful.

He is now working on a fundamental redesign of the electricity balancing services and markets in GB under the Future of the SO programme.



Mr. Yoav Zingher
CEO of KiwiPower

Yoav Zingher and Ziko Abram co-founded KiWi Power in 2009 with a vision of creating an energy demand response business that leads the way in managing electricity demand through technology. Since starting KiWi Power Yoav has led the creation of award winning, proprietary software and hardware to fully automate the demand response process, played a leading role in influencing policy to shape the UK energy market and more recently as CEO, overseen the investment in KiWi Power by the world's second largest utility, ENGIE. Prior to starting up KiWi Power Yoav was a founding partner of 4rae Renewable and Alternative Energy Investments, a private equity group with \$200 million under management, where he specialised in smart energy and project development of renewable energy including wind, solar and biomass power stations. Yoav's background is in finance as part of the private equity investment team that entered the ultra-deepwater oil-drilling sector, culminating in the construction of three drillships with an aggregate value exceeding \$1.5bn and an IPO on the New York Stock Exchange (Pacific Drilling). As well as in a New York-based hedge fund, specialising in long/short investments and arbitrage and at an Israeli Venture Capital firm based in Tel Aviv.

SESSION 6 | HOW CAN DEVELOPMENT PARTNERS WORK WITH NATIONAL GOVERNMENTS TO ENABLE THE TRANSITION TO THE ENERGY SYSTEMS OF THE FUTURE? (CLOSING SESSION)



Moderator | Mr. Ranjit Lamech
Director, Energy and Extractives Global Practice, World Bank

Please see bio, page 11.



Mr. Chris Chijutomi
Investment Director, CDC Group

Chris joined CDC in January 2017 as an Investment Director in the Infrastructure Equity Team. Chris has over 19 years of extensive infrastructure experience in Europe and Africa covering the following sectors: power, water, wastewater and transport. Prior to joining CDC, Chris was a founding member of the pioneer ARM-Harith Infrastructure Fund (ARMHIF), a West African focused infrastructure fund based in Nigeria.

As a director in ARMHIF for 6 years, his responsibilities included fundraising, origination, development, execution and portfolio management. Notable transactions closed, include the \$876m 450MW Azura-Edo IPP in Nigeria and the \$552m 200MW Amandi Energy IPP in Ghana. Chris has also worked and held various senior positions at RWE Thames Water and at Veolia Environment in the UK, including in 2006 being the General Manager of Veolia's delivery vehicle for Project Aquatrane, the UK governments largest water and wastewater Public Finance Initiative (PFI) contracts across Scotland.

Chris is a Chartered Engineer and holds an MEng in Chemical & Process Engineering from the University of Surrey, along with a CMS (General Management) from Kingston University.



Mr. Peter Hilliges
Head of Division and Climate Policy Coordinator, Competence Centre Climate and Energy, KfW Development Bank

Peter Hilliges joined KfW Development Bank in 1996 after completing his degree in economics and political science. He has worked with KfW in different positions, mostly related to energy, natural resources and climate change.

In 2001, he was posted at the GEF Secretariat for two years and obtained a substantial exposure to the UNFCCC world. After leading the climate change work in natural resource related topics (forestry, soil, agriculture) for six years, he was posted in Delhi/ India from 2013-2017, heading KfW's operations in India. He returned to KfW Frankfurt in August 2017 as Team Leader and Climate Policy Coordinator of the Development Bank. In this position, he is responsible for KfW Development Bank's sector work in Energy as well as Climate Change.



Mr. Steve Beel

Country Lead, Cities Infrastructure for Growth Programme, DFID Zambia

Steve Beel oversees DFID's work on energy, infrastructure, cities and PPPs in Zambia, including a close in-country collaboration with World Bank/ESMAP. He previously spent nearly 10 years at the UK energy regulator, Ofgem, where he was Commercial Director in the Networks division, was responsible for over £5bn of investment through PPP-style project finance concessions and led the division named Global PPP Promoter of the Year in 2016.

Before that he worked in the private sector, across all aspects of infrastructure development, financing and operation, and in a number of different areas including transportation, urban development, defence, energy and social infrastructure.



Daw Mi Mi Khaing

Director General, Department of Electric Power Planning, Myanmar

Mi Mi Khaing is Director General and oversees the activities for policy formulation, legal framework, public-private partnership, project development and power development planning of the electricity sector in Myanmar. She joined the electricity sector in 1995 and has over 22 years' experience in Power Sector Planning in terms of Generation Transmission & Distribution facilities improvement, Renewable Energy Deployment and contributed with her best efforts to more electricity access in the Country.

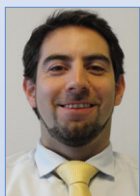
She takes part in Regional Power Trade Coordination Committee (RPTCC) of the GMS countries and is also a member of the Heads of ASEAN Power Utilities/Authorities (HAPUA) Council of the ASEAN and bilateral cooperation with other countries.



Ms. Sophie Johnson

President, Renewable Energy Association of Sierra Leone (REASL)

Please see bio, page 14.



Mr. Cristian Lühr

Head of Electricity Tenders Unit, Comisión Nacional de Energía (CNE), Chile

Please see bio, page 16.



Ms. Camila Schoti

Director of Energy, ABRACE – Associação Brasileira de Grandes Consumidores Industriais de Energia e de Consumidores Livres, Brazil

Please see bio, page 16.

CLOSING REMARKS



Ms. Melinda Bohannon

Deputy Director and Head of Department for Growth and Resilience, DFID

Melinda Bohannon has 17 years international experience across a range of high profile policy issues in Government including international development, economic transformation and climate change. She has worked in the Middle East and North Africa, Russia and the Former Soviet Union, and China. She has worked extensively with the United Nations, Multilateral Development Banks and the European Commission.

She recently lead the UK negotiating team for the post-2015 Development Agenda, and in her current role is shaping DFID's investments on economic transformation in sub-Saharan Africa and south Asia. As part of this, she is supporting the UN Secretary General's High Level Panel on Women's Economic Empowerment.



Mr. Pete Betts
Director of International Climate and Energy, BEIS

Peter Betts has been the Director of International Climate Change (first in DECC then in the Department of Business, Energy and Industrial Strategy) since 2008. In October 2016 he also took on responsibility for international energy. He has overall responsibility for UK strategy on international climate policy, including the international negotiations, on which he was Lead Negotiator for the EU for six years including at the Paris COP. He is SRO for BEIS's share of UK climate finance (£2bn in the current Spending Review period).

Pete has a long career in the Civil Service working in many Departments. Between 1994 and 1998 he was first secretary for environment at the UK's Permanent Representation to the EU in Brussels, negotiating environmental legislation. Between 1998 and 2001 he was head of UK negotiations and domestic policy on climate change in the Dept of Environment, Transport and the Regions.

Between 2001 and 2004 he was at HM Treasury where he was head of social security spending and then of pensions and savings policy. From 2004 to 2005 he was Principal Private Secretary to the Deputy Prime Minister. In 2005 he became the Director of Regional Policy at the Department of Communities and Local Government and from 2006 – 2008 he was Director of Fire and Civil Resilience in the same department. He began his current post in April 2008.

Prior to that, Pete joined the civil service in 1984 and undertook a number of posts including Private Secretary to the Minister for Housing and Planning and to the Minister for Local Government. From 1991 -1992 he was at the Ecole Nationale d'Administration in Paris.

He was appointed a CBE in 2010.

Peter has a degree in History from Mansfield College, Oxford. .



Mr. Rohit Khanna
Practice Manager, Energy Sector Management Assistance Program (ESMAP), World Bank

Please see bio, page 11.

Please visit our webpage at:

www.esmap.org



Visit the event page at:

https://www.esmap.org/esmap_knowledge_exchange_forum2017

Hotels near the Westminster Conference Center, 1 Victoria Street

1	CLUB QUARTERS AT TRAFALGAR SQUARE Rate: 188.00 GBP
2	DOLPHIN HOUSE Rate: 156.80 GBP
3	DOUBLETREE BY HILTON LONDON, WESTMINSTER Rate: 171.00 GBP
4	ST JAMES COURT, A TAJ HOTEL Rate: 190.00 GBP
5	TAJ 51 BUCKINGHAM GATE LONDON
6	THE MAY FAIR HOTEL LONDON
7	JUMEIRAH LOWNDES HOTEL
8	INTERCONTINENTAL LONDON PARK
9	RUBENS AT THE PALACE Rate: 185.00 GBP
10	THE ROYAL HORSEGUARDS
11	AMBA HOTEL MARBLE ARCH
12	CLUB QUARTERS, GRACECHURCH

* hotels depicting a rate next to their name are part of the WB Preferred Hotel Program Directory and can offer the WBG pre-negotiated rate.

Suggested App to get around London

CITYMAPPER

Download from Apple devices [here](#) | Download from android devices [here](#)

Getting to the Club Quarters Hotel at Trafalgar Square from the airport (without taking a taxi)

Note: this example has been researched for those staying at the Club Quarters Hotel at Trafalgar Square at: 8 Northumberland Avenue London, WC2N 5BY.

- **Quickest but most expensive:** i) Heathrow Express train to Paddington, ii) Underground from Paddington to Charing Cross (Bakerloo Line), iii) Walk from Trafalgar Square exit of Charing Cross station to hotel. 40 mins.
- **Cheapest but longer:** i) Underground from Heathrow to Leicester Square (Piccadilly Line), ii) Walk via Trafalgar Square to hotel. 1 hour.
- **Same as above but less walking:** i) Underground from Heather to Piccadilly Circus (Piccadilly Line), ii) Underground from Piccadilly Circus to Charing Cross (Bakerloo Line), iii) Walk to hotel. 1 hour.



Tips | Purchase an Oyster Card at your first Underground station (card can be refunded when leaving), or use a contactless credit card to enter/exit. Fares are double with paper tickets.

Contacts

- **Marjorie Araya** | maraya@worldbank.org or 1-202-243-9874
- **Oliver Knight** | oknight@worldbank.org or 1-202-674-0602



AGENDA AT A GLANCE | NOVEMBER 29 – DECEMBER 1, 2017

DAY 1 | WEDNESDAY NOVEMBER 29, 2017

12:00 **Registration and lunch**

13:30 **Opening addresses**

14:00 Session 1 | Introductory Plenary: Visions of the Evolution of Energy Systems

15:00 **Refreshments & Networking**

16:00 Session 2 | How Will the Role of Utilities in the Future Energy System Evolve?

18:00 Reception Hosted by the Shell Foundation

20:00 Location: Shell Centre, South Bank, London, Belvedere Road Waterloo SE1 7NA
Highlights by | Shell Foundation, DFID, and World Bank

DAY 2 | THURSDAY NOVEMBER 30, 2017

09:00 Session 3 | How Innovative Off-Grid Initiatives and Improved Planning Tools are Improving Access in Developing Countries

10:30 **Refreshments & Networking**

11:15 Session 4 | What Are the Challenges and Opportunities of Mobilizing Commercial Capital Due to Changes in Energy Systems?

12:45 **Lunch**

14:15 Session 5 | How Market-Based Solutions Can Unlock Power System Flexibility through Stronger Price Signals

15:15 **Refreshments & Networking**

16:15 Session 6 | How Can Development Partners Work with National Governments to Enable the Transition to the Energy Systems of the Future? (Closing session)

17:15 **Closing remarks**

- Melinda Bohannon, Deputy Director and Head of Department for Growth and Resilience DFID
- Pete Betts, Director of International Climate and Energy, BEIS
- Rohit Khanna, Practice Manager, ESMAP

DAY 3 | FRIDAY DECEMBER 1, 2017 | FIELD TRIPS

08:30 Option 1 | Visit to the National Grid Control Centre
Option 2 | Visit to Thames Water

Return time 13:30. Participants will have a chance to get off at Heathrow Airport on the way back from the field trip. The final stop will be the Club Quarters Hotel.