Towards a Consumer-Driven Energy System

Understanding Human Behaviour



An event organised under the auspices of the Experts' Group on R&D Priority Setting and Evaluation (EGRD)

12-13 October 2017

Hosted by the Technical University of Denmark Main Building, Rooms S01 and S02 Lyngby, Denmark



International Energy Agency (IEA)

The IEA is an autonomous agency established in November 1974. Its mandate is two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply and to advise member countries on sound energy policy. The IEA carries out a comprehensive programme of energy co-operation among 29 advanced economies¹. The Agency aims to:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions.
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context particularly in terms of reducing greenhouse-gas emissions that contribute to climate change.
- Improve transparency of international markets through collection and analysis of energy data.
- Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies.
- Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations, and other stakeholders.

Since the 1980s, the IEA has continued to build good working relationships with countries beyond its membership, in particular major energy consuming, producing and transit countries. Countries with which the IEA seeks enhanced engagement including Accession countries Chile and Mexico, Association countries China, India, Indonesia, Morocco, and Singapore. Co-operation with these and other partner countries cover a wide range of activities, from joint workshops to in-depth surveys of specific energy sectors or data exchange. Combined, the IEA co-operates with more than 69 countries worldwide.

IEA Energy Technology Network

The IEA Energy Technology Network is an ever-expanding, co-operative group of more than 6,000 experts that support and encourage global technology collaboration. At the head of this vast network is the Committee on Energy Research and Technology (CERT).

Committee on Energy Research and Technology

Comprised of senior experts from IEA member governments, the Committee on Energy Research and Technology (CERT) considers effective energy technology and policies to improve energy security, encourage environmental protection and maintain economic growth. Under the guidance of the IEA Governing Board, the CERT oversees the technology forecasting, analyses and the research, development, demonstration and deployment (RDD&D) strategies of the IEA Secretariat, notably through its flagship publication, *Energy Technology Perspectives*, and the series of energy technology roadmaps. The CERT also provides guidance to its working parties and experts' groups to examine topics that address current energy technology, or technology policy, issues. The CERT is supported in its work through four topical working parties, including the EGRD.

Experts' Group on R&D Priority-Setting and Evaluation (EGRD)

The EGRD examines analytical approaches to energy technologies, policies, and R&D on targeted, timely topics. The results and recommendations support the Committee on Energy Research and Technology (CERT), feed into IEA analysis, and enable a broad perspective of energy technology issues. Recent topics analysed include Blue Sky Research for Energy Technology (2017), Life in the Fast Lane: evolving paradigms for mobility and transportation systems of the future (2016), Space Cooling (2016), Island Energy - Status and Perspectives (2015).

¹ Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea (Republic of), Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States; The European Commission also participates in the work of the IEA.

Towards a Consumer-Driven Energy System: Understanding Human Behaviour² 12-13 October 2017

Hosted by the Technical University of Denmark, Lyngby, Denmark

Introduction

Energy production, distribution and consumption all have technical and human components, though little research exists on the latter. However, there is an increasing focus beyond technology and economics towards the societal aspects of energy technologies. In this regard, human-centred methods are essential to capturing the role of humans in shaping energy use and consumption, including attitudes, habits and experiences. Individuals and their choices matter and may influence patterns and modes of consumption far more than expected. Therefore understanding individual and organisational behaviour and decision-making is critical to accelerating the transition to an energy-efficient and low-carbon energy future. To be effective, policies and measures should consider the consumer as central to current and future energy systems.

Analytical frameworks to enhance policy effectiveness

Macro-economic consumer choice theory states that the consumer will choose the product with the highest quality or utility that is attainable within the budget constraints. However, this may not be an entirely accurate description of *how* or indeed *why* people make choices. Behavioural economics theory posits that the choices are shaped in large part by how they are presented to us, rather than by what they represent. However, consumer choices for energy sources and technologies may be more complex in nature, involving a variety of criteria such as culture, lifestyles, and knowledge and organisational dynamics.³

Human-centred analytical frameworks may enhance forecasts and policy effectiveness. Elements such as describing norms, cultures and lifestyles more accurately; explaining barriers to technologies; understanding social acceptance of technologies; identifying opportunities for novel or non-commercial systems; and more accurately estimating and predicting the dynamics of individual choices influenced by cultural and societal factors.

The consumer at the centre of the distributed energy system

Consumer choices are not made in isolation; they are a function of the society and conditions in which they are made. Geographical (local, regional, national) location, social identity and income may also be a factor. At a time when the energy landscape is undergoing a fundamental change towards decentralisation and decarbonisation, digitalisation of the energy system will provide opportunities for the uptake of new energy services and business models, which enable the consumers to actively participate in the energy system and markets. While policy makers are beginning to understand consumers' views and concerns about such opportunities, in some cases the pace of innovation is outpacing the understandings.

For energy consumers, there is a trend towards enhanced, interactive technologies for managing energy use. This includes in-home devices to manage consumption as well as technologies to manage time-of-supply pricing. The 'shared economy' has also resulted in joint ownership and management of distributed technologies such as wind or PV – the so-called 'prosumers' or 'aggregators'. These developments reinforce the role of the consumer rather as bottom-up 'drivers' of energy systems, but also raise concern regarding consumer protection and privacy and sound management of consumer data as well as other issues such as social equity or 'missing monies'.

² This event will focus on individual and organisational behaviour and decision-making related to energy use in order to inform R&D policies and measures. It draws on findings from previous EGRD workshops, in particular "The Transition to a Low-Carbon Economy: Socio-Economic Considerations" and "Will a smarter grid lead to smarter end users or vice versa.

³ Sovacool, B.K. (2014), "What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda", *Energy Research and Social Sciences*, 1, 1-29.

In parallel, driven by environmental concerns such as climate change and water shortages, companies are engaging in corporate social responsibility (CSR) programmes, often driven by the need to maintain brand loyalty among consumers seeking environmentally sustainable options. As a result, designing appropriate framework policies that both incentivise businesses to adjust while at the same time considering the consumer - can be challenging.

R&D policies and decision-making

When designing programmes and policies, R&D strategists and planners could benefit from insights into the aspirations, fears and choices people make within a multi-dimensional, changing energy and economic landscape.

Traditionally linear R&D frameworks are moving increasingly towards innovative processes (challenges, special programmes), funding (crowd-funding, co-funding) and ownership (co-operative, non-proprietary or open-source R&D). This 'open' style of R&D includes a broader set of actors in decision-making processes, participatory ownership of results, co-operation among stakeholders and users, experimentation and flexibility. The role of the consumer in these developments should be considered by R&D planners in energy institutions alongside the socio-economic developments within the changing energy landscape.

Scope

This workshop will focus on "A Consumer-Driven Energy System: Understanding Human Behaviour". Participants will explore the individual and organisational behaviour and decision-making related to the energy use in order to inform more effective R&D planning and policies.

Target audience

In addition to EGRD members and national experts, we are seeking input from social scientists, behavioural economists, RD&D decision-makers, strategic planners and programme managers from industry, academia, think tanks, national laboratories, government and non-governmental entities. Participation is by invitation only.

Outcomes

The workshop will result in a summary report that aims to identify challenges concerning humancentred methods and perspectives and to highlight best practice.

Questions to frame the discussions

Which challenge-driven research methods include human-centred methods?

Which examples of combining human-centred research with quantitative data collection and analysis are the most appropriate?

Are there methods that are incompatible with an interdisciplinary approach?

Which assumptions (risk, modernity, culture, time, materialism, cost and end-use) are most associated with specific forms of research or technologies? How can these risks be managed?

How can the advantages of decentralisation be coupled with those of centralisation?

How do consumer's past behaviour and attitudes towards energy influence their use of energy today? How can behavioural change advisories be introduced without consumers perceiving them to be

controlling?

How do energy service conventions evolve?

Are 'open' and 'closed' styles of research mutually exclusive or are there synergies?

What are the endogenous or exogenous causes of failed energy innovations?

Which best practises in governance (e.g. transparency, accountability, legitimacy, participation etc.) affect R&D energy policy?

AGENDA

DAY 1 – Thursday, 12 October 2017, Room S01

Session 1: Introduction

Chair: Birte Holst Jorgensen			
08:30	Registration		
9.00	1	Welcome	Dr. Katrine Krogh Andersen, Dean of Research, Senior Vice President, DTU
9:15	2	Introduction	Rob Kool, Chair EGRD, Netherlands Enterprise Agency
9:30	3	Accelerating energy technologies in the Danish context	Anders Hoffmann, Deputy Permanent Secretary, Ministry of Energy, Utilities and Climate
10:00	Coffee break		

Session 2: Setting the scene

		Chair: Atsushi Ku	rosawa
10:30	4	Behaviour change research collaboration: Insights, tools and results	Sea Rotmann, CEO, Sustainable Energy Advice
11:00	5	What drives energy consumers?	Thijs Bouman, Faculty of Behavioural and Social Sciences, University of Groningen
11:30	6	Multi-perspective system analyses for robust energy decision support	Bert Droste-Franken, Head of Energy Department, EA European Academy GmbH
12:00	Discussion		
12:30	Lunch		

Session 3: Human-centred analytics to enhance policy effectiveness

Chair: Rob Kool			
13:30	7	Prosumers	Mathew Kennedy, International Energy Research Centre
14:00	8	Business models for a more effective market uptake of DSM energy services	Ruth Mourik, DuneWorks B.V.
14:30	9	Impacts of energy choices - examples of research approaches with quantitative data collection and analysis	Tiina Koljonen, Research Team Leader, VTT Technical Research Centre of Finland
15:00	Coffee break		
15:30	10	Applying behavioural economics to move to a more sustainable future	Karl Purcell, Programme Manager, Behavioural Economics Unit, Sustainable Energy Authority Ireland (SEAI)
16:00	11	Behavioural economics and modelling	Carrie Pottinger, Programme Manager, Energy Technology R&D Networks, IEA
16:30	Discussion		
16:45	Close day 1		

16:45 Visit to EnergyLab Nordhavn (<u>http://www.energylabnordhavn.dk/</u>)

19:00 DTU hosted dinner at Madklubben Noerrebro

Sortedam Dossering 7C, 2200 København N (<u>http://madklubben.dk/en/noerrebro/</u>)

AGENDA

DAY 2 - Friday, 13 October 2017, Room S02

Session 4 : The consumer at the centre of a distributed energy system

Chair: Johannes Tamborino			
9:00	12	Energy for society	Prof. Benjamin Sovacool, University of Sussex and Aarhus University (virtual)
9:30	13	The consumer at the centre of a distributed energy system	Elisabeth Düttschke, Fraunhofer ISI
10:00	14	Residential behaviour-based energy efficiency programmes and activities in Japan	Dr. Ji XUAN, Ph.D., Jyukankyo Research Institute
10:30	Coffee break		
11:00	15	City of Tomorrow (E_PROFIL) - neighbourhood profiles for optimised energy transformation processes	Prof. Daniel Latzer, Doctoral Researcher, Technical University of Vienna
11:30	16	Behaviour and decision-making concerning energy efficiency in the chemical industry	Lieven Stalmans, Borealis, Co-Chair, European Chemical Industry Council (CEFIC)
12:00	17	What do people want from (low carbon) heat at home and how can we find out?	Matthew Lipson, Head, Consumer Insight, Catapult
12:30	Discussion		
13:00) Lunch		

Session 5: R&D policies and decision making

Chair: Herbert Greisberger			
14:30	19	Knowledge-action networks	Erik Pihl, Future Earth Stockholm
15:00	20	R&D policies and programmes with (and for) citizens	Annika Sohre, Swiss Centre for Excellence for Energy, Society and Transition (SCCER-CREST)
15:30) Coffee Break		
16:00	18	Social Science and the Humanities within Horizon 2020: meeting European Energy Challenges	Gerd Schönwalder, Policy Officer, Directorate General for Research and Development, European Commission

Session 6: Summary and workshop close

Chair: Birte Holst Jorgensen		
16:00	Final discussion	
16:30	WRAP UP	

SPEAKERS AND MODERATORS



Dr. Katrine Krogh Andersen is the dean of research and the senior vice president at the Technical University of Denmark (DTU) where she strengthens DTU's ability to attract external research grants and helps to coordinate and promote the University's research-related activities. Previously she was the director of Research and Development at the Danish Meteorological Institute (DMI). Her career also includes research on climate modelling, statistical data analysis, and ice core drilling at the Niels Bohr Institute, and preparations for the 2009 UNFCCC Conference of the Parties (COP15) for the Ministry of Climate and Energy. Katrine is a Member of the Danish Council for Research and Innovation Policy, a member of the Danish Academy of Technical Sciences, Programme Board member of the Norwegian Research Council, and member of the Executive Committee of the European Energy Research Alliance. Katrine holds has a PhD in physics (University of Copenhagen).



Dr. Birte Holst Jørgensen, Technical University of Denmark, is vice chair of the IEA EGRD. She is an experienced researcher and practitioner in the field of new energy technologies and systems, where she has specialised in energy R&D strategies and technology policies at national, European and international level. She is Principal Coordinator in sustainable energy at the Sino-Danish Centre for Research and Education, a strategic co-operation between the Danish universities, the Danish Ministry of Science, Technology and Innovation and the University of the Chinese Academy of Sciences and the Chinese Academy of Sciences. Ms. Jorgensen holds a M.Sc. in Business Economics (Copenhagen Business School) and a Ph.D in Political Science (University of Copenhagen).



Anders Hoffmann is appointed Deputy Permanent Secretary at the Danish Ministry of Energy, Utilities and Climate where he oversees the areas of national power markets, telecommunications, digitalisation, government-to-government cooperation on energy, membership of multilateral organizations such as the IEA, export promotion and affairs related to the Arctic. Previously he held several leadership roles in the Danish government, including as Deputy Permanent Secretary of Danish Ministry of Energy, Utilities and Climate, Deputy Director General of the Danish Business Authority and as Deputy Director General of the Danish Business and Construction Authority. Other relevant posts include as Creative Director for FORA, and as a Senior Economist at the Organisations for Economic Co-operation and Development (OECD). Mr. Hoffmann holds a Ph.D. in Economics (University of Copenhagen).



Dr. Atsushi Kurosawa is Director, Global Environmental Program, Research and Development Division, Institute of Applied Energy (IAE) where he has led many energy and environment related projects. Currently his research focuses on integrated assessments of global climate change and energy R&D strategy through the integrated assessment model GRAPE and TIMES-Japan model. He has held visiting positions at Stanford University and the Research Institute of Innovative Technology for the Earth. He also serves as Visiting Professor of Kyushu University, Lecturer of Tokyo University of Agriculture & Technology, Visiting researcher of Japan Science and Technology Agency, Fellow of New Energy and Industrial Technology Development Organization and visiting researcher at University of Tokyo. He earned a B.S. in nuclear engineering (Nagoya University), an M.S. in nuclear engineering (Tokyo Institute of Technology), and a Ph.D. in electrical engineering (University of Tokyo).





Thijs Bouman is a researcher in Social and Environmental Psychology at the Faculty of Behavioural and Social Sciences at the University of Groningen (the Netherlands). His research focuses on how personal and group factors affect environmental behaviours and beliefs. Moreover, he investigates how technological innovations could be used to motivate and promote pro-environmental behaviours among citizens, and studies the interaction between smart technologies and consumers. Thijs also works as a Research Advisor for the European Commission's DG ENER and collaborates with various private and public partners on energy and sustainability related issues. He worked as a lecturer at the Windesheim University of Applied Sciences and obtained a PhD on the influence of threatening global situations on local intergroup relations, a Masters diploma in Social Psychology and Social Sciences, and a Bachelor of Science in Social Psychology (all at the University of Groningen).

Bert Droste-Franken is Head of Energy Department at the EA European Academy of Technology and Innovation Assessment GmbH, a scientific academy with thematic focus. Bert has more than 20 years of experience with energy related issues including assessment of environmental impacts and damage costs, sustainability and welfare indicators, integrated assessment modelling, model integration, technology assessment, energy system analyses for policy support and innovation assessment in many national and international inter- and trans-disciplinary projects. Previously he was researcher at Institut für Energiewirtschaft und Rationelle Energieanwendung (IER), Universität Stuttgart. Bert holds a diploma in physics (Universität Heidelberg, external thesis at MPI Heidelberg (Atmospheric Physics Group)) and a PHD in Engineering Science (Universität Stuttgart).



Rob Kool, Chair of the IEA Experts' Group on R&D Priority Setting and Evaluation, is Interim manager at the Netherlands Enterprise Agency (RVO.nl). Rob has over 30 years of experience with a broad range of topics in the energy field such as municipal energy policy, design of new efficient suburbs, district heating, build environment, joint implementation, CDM and leading international collaboration projects. Rob held leadership roles in many international fora, including the association of European Energy Agencies (EnR), vice-president of the European Council for Energy Efficiency. He is the Chair of the IEA Demand-Side Management TCP. Rob holds a business degree from the Netherlands Business School and a degree in biology (University of Utrecht).



Dr. Matt Kennedy is Head of Strategy and Business in the International Energy Research Centre, a Irish Government supported, industrial led, collaborative energy research centre. He was previously responsible National Delegate (Energy) for H2020 for Ireland and led Energy R&D for the Sustainable Energy Authority of Ireland. Matt was the lead EU Negotiator for technology transfer at COP21 UNFCCC and was a member of the UNFCCC Technology Executive Committee (TEC). Matt was Chair of the UN's Climate Technology Centre, Chair of the IEA's Renewable Energy Technology Deployment Implementing Agreement and the Chair of the Programme Board of the Renewable Energy and Energy Efficiency Partnership (REEEP). Matt holds a PhD in Engineering from Trinity College Dublin, and Masters' degrees from NUI Galway and University College Dublin.



Ruth Mourik is CEO of DuneWorks, a private research company. Projects she worked on include projects on energy and behaviour change and new business models for the International Energy Agency Demand Side Management Programme, several FP7 and H2020 projects (UseITsmartly, Nature4Cities, DrBoB, ShapeEnergy), but also more grounded projects with residents, housing corporations, municipalities. Previous employers include Maastricht University, Eindhoven Technical University and the Energy research Centre of the Netherlands (ECN). Ruth has Masters in Anthropology, Sociology, and Society and Technology Studies (STS), and holds a PhD in systemic technological and societal transitions.





Tiina Koljonen leads the Energy Systems and Climate research team at VTT Technical



Energy Authority Ireland (SEAI) which aims to improve the energy behaviours of Irish businesses and households by embedding behavioural economics in the communications and policies designed by the SEAI. Previously Karl worked in the Irish Department of Public Expenditure and Reform applying behavioural economics to public policymaking. He has published a number of papers ion these topics, including *Exploring the personality profile of the 'green consumer' - explaining individual heterogeneity in willingness to pay for environmentally friendly goods*. He is an active member of the Irish Behavioural Science and Policy Network. Karl holds an Honours Bachelor's Degree in Business Studies (Finance) (Dublin City University) and an MSc in Behavioural Science for Management (University of Stirling).



Carrie Pottinger, Programme Manager for the Technology R&D Networks at the IEA, oversees a vast network of 6,000 experts participating in the 40 international R&D groups supported by the IEA (Technology Collaboration Programmes, or TCPs). With more than 25 years cumulative energy knowledge and analysis, particularly in the areas of energy statistics, energy policies and technology and R&D, including leading or contributing to 30 published works. She currently serves as Secretary to the IEA Experts' Group on R&D Priority-Setting and Evaluation and the Fusion Power Co-ordinating Committee, and led recent efforts to revise the evaluation and review process for the TCPs on behalf of the Committee on Energy Research and Technology. Ms. Pottinger holds a degree in Communications (University of Washington) and has studied economics, data analysis and price forecasting.



Dr. Johannes Tambornino is the head of the unit Energy Strategies and Systems Analysis at Project Management Jülich where he is responsible for the R&D program on energy systems analysis funded by the German Ministry of Economic Affairs and Energy. He is leading a group that covers a broad range of topics along the energy innovation chain and currently serves as the German representative in the IEA Experts' Group on R&D Priority Setting and Innovation. He holds a PhD in mathematical physics and has actively pursued research in quantum gravity and cosmology at different laboratories in Canada, France and Germany before changing fields and devoting his time to energy.

Dr. Benjamin K. Sovacool is Professor of Energy Policy at the Science Policy Research Unit (SPRU), University of Sussex (United Kingdom) where he serves as Director of the Sussex Energy Group and Director of the Center on Innovation and Energy Demand which involves the University of Oxford and the University of Manchester. He is also Director of the Center for Energy Technologies and Professor of Business and Social Sciences at Aarhus University (Denmark). Prof. Sovacool's work focuses on issues pertaining to energy policy, energy security, climate change mitigation, and climate change adaptation. More specifically, renewable energy and energy efficiency, the politics of large-scale energy infrastructure, designing public policy to improve energy security and access to electricity, and building adaptive capacity to the consequences of climate change. He has held positions at the Vermont Law School, National University of Singapore, and Oak Ridge National Laboratory.
Dr. Elisabeth Düttschke is a senior scientist and project leader at the Fraunhofer ISI where she focuses on technology acceptance, chances and barriers to energy efficiency, evaluation studies and qualitative and quantitative methods. Outside academia she carried out consulting for private and public organisations and journalism. Post-doc positions include as a research associate (RWTH Aachen) and a research associate and lecturer (Universität Konstanz). Elisabeth holds diplomas in psychology, business administration and marketing (TU Darmstadt and RWTH Aachen, respectively) and a PhD summa cum laude (Universität Konstanz) and award winner award from Südwest Metall.
Dr. Ji XUAN is a researcher at the Jyukankyo Research Institute (JYURI) where she focuses on energy consumption field surveys in the residential and commercial sectors, behavioural aspects of energy efficiency, and other topics. Since 2014, her work has focussed on the field studies of household energy use in Southeast-Asian countries. Dr. Xuan is one of the main staff members of the Japanese organizing team for the annual Behaviour, Energy & Climate Change Conference in Japan. Dr. Xuan holds a Bachelor's degree in architectural environmental engineering (Jilin Institute of Architecture and Civil Engineering, China), a Master's degree and a Ph.D. in architectural environmental engineering (the University of Kitakyushu, Japan).
Daniel Latzer , is a researcher and PhD candidate at the Centre of Regional Science at Vienna University of Technology, where he currently coordinates the research project E_PROFIL, which investigates energy-related transformation processes at the neighbourhood level (funded within the programme City of Tomorrow). In Daniel's previous positions he was responsible for urban and regional planning in Austria. His core competencies include regional and communal analysis, geographic information systems, development planning, energy and environmental planning and public participation. Daniel also works as lecturer in the field of energy issues in planning at the Vienna University of Technology. He holds diplomas in Engineering for Spatial Planning (Technical University of Vienna).



Lieven Stalmans, European Chemical Industry Council, joined Borealis in 2000 and became responsible for the energy efficiency program at the Borealis plants in Belgium in 2003. This responsibility further extended into the areas of CO2 emission trading and energy sourcing. Since 2009 he is Group Manager Energy and Environment for Borealis. Lieven is active in associations on national and European level, and the European Chemical Industry Council CEFIC in particular. He is Co-Chair of CEFIC's Energy and Climate Strategy Working Group, and Chairman of the Working Party on Energy within the Flemish Chemical Industry Association, essenscia. He holds a Master's Degree and a Ph.D. in chemical engineering (Leuven University, Belgium).





Matthew Lipson is Head of Consumer Insight at the UK's Energy Systems Catapult (ESC) helping bring industry, academia and Government together to accelerate the development of successful low carbon energy products, services and policies enrich peoples' lives. Matthew started his career working in small tech start-ups and Orange and has spent the last decade working with Universities and businesses for the UK's Department of Energy and Climate Change, Committee on Climate Change and Energy Technologies Institute. He is currently focus on harnessing the emerging 'Smart', connected home to decarbonise home life. Matthew holds a BSc in Psychology (Sheffield University), an MSc in Environmental Technology (Imperial College) and a PhD in Neuroscience (Oxford University).

Dr. Herbert Greisberger is the Managing Director of the Lower Austrian Energy and Environment Agency where his projects focus on energy and innovation with a special focus on sustainable buildings and renewables. Mr. Greisberger is also scientific manager of the Austrian Futurelab focusing on long-term developments and their consequences for society. He was formerly the senior scientist on R&D, innovation and energy technologies for the Austrian Energy Agency and the Austrian Society for Environment and Technology. Mr. Greisberger is also a lecturer at the Institute for Research and Education focussing on energy economy and energy management. Mr. Greisberger studied economics (University of Graz and Vienna) and holds a PhD (University of Stuttgart).



Dr. Erik Phil is the Research Liaison Officer at the Sweden Hub of Future Earth, based at the Royal Swedish Academy of Science where his research focuses on decarbonizing the energy system, mainly through optimization of concentrating solar power and biomass energy power plants. As an expert on concentrating solar power, he has acted as Swedish representative in work for the European Academies Science Advisory Council. His strong technical background is complemented with a diverse set of experiences, such as contributing to marine biological research, local politics, NGOs, and as TEDx speaker. He studied Environmental Engineering (Lund University) and holds a Phd (Chalmers University of Technology).





Dr. Annika Sohre is a postdoctoral researcher at the Sustainability Research Group, University of Basel where she works on governance issues in the fields of individual energy consumption behavior, sustainable development, energy transition, mobility and climate change for the Swiss Competence Center for Research, Society and Transition (SCCER-CREST). Currently she works in interdisciplinary teams in different larger research projects such as the Swiss Household Energy Demand Survey (online surveys and experiments) which provides insights for developing successful intervention strategies. Previously she held positions as a consultant for energy policy for EnBW AG and as a project researcher at the Free University of Berlin. She holds a diploma in environmental sciences (University of Lüneburg) and a PhD (Free University of Berlin).

Gerd Schönwälder is a Policy Officer for Strategy at the Research and Innovation (RTD) Directorate-General of the European Commission where he focuses on the socioeconomic and political aspects of the clean-energy transition as well as international collaboration, particularly in the context of Mission Innovation. Previously, he was a Senior Associate and guest researcher at the Centre for International Policy Studies (CIPS) as well as the German Development Institute (DIE), Director of Policy and Planning at the International Development Research Centre (IDRC) (Canada), and Deputy Director of the Canadian Foundation for the Americas (FOCAL). Gerd holds a PhD in Political Science (McGill University).