

DR PHIL GRÜNEWALD, FICE

DEPARTMENT OF ENGINEERING SCIENCE, UNIVERSITY OF OXFORD
philipp.grunewald@eng.ox.ac.uk — 07870 101101

EXPERIENCE

Department of Engineering Science

2020 – present

Senior Researcher

University of Oxford

- Research Director and Oxford PI for the Energy Demand Observatory and Laboratory (EDOL) £7.4m programme grant (EP/X00967X/1)
- Lead researcher for MCS Charitable Foundation on heat pumps performance (£50k)
- Lead researcher on Oxford Martin Programme Reconfiguring Energy Needs, Equity and Wellbeing (ReNEW) (£100k)
- Coordinating data collection and repository for longitudinal high resolution smart meter data
- Recruited over 200 participants and trialled demand side flexibility with energy monitors and diaries
- Lecturer on energy demand, flexibility and storage

Oriel College

2017 – present

Supernumerary Research Fellow (since 2023), Jackson JRF (– 2020) and College Tutor

- Tutor for Engineering in Society. Finance, Project Management, Ethics, Strategy, Sustainability
- Founding member of the Oriel Environmental Group
- Conduct admission interviews
- Senior Member, Oriel College Boat Club

2018 – 2021

MPLS, Oxford Energy Network

2013 – present

Steering Group, Deputy Director, Network Lead, Coordinator

University of Oxford

- Supported network creation, developed website and database for 190 senior academics
- Organised events with up to 200 attendees and high profile meetings incl. at the House of Lords

School of Geography and Environment

2013 – 2020

EPSRC Early Career Fellowship

University of Oxford

- Research group leader and PI of METER study (£880k EP/M024652/1). Team with PostDoc, 3 DPhils and 8 interns
- Pioneered novel time use data collection to explain household energy demand and flexibility
- Vice Chancellor's award for innovative research
- Recognition of excellence by the Department
- International collaborations with Stanford, Münster, TU Berlin, Siemens and many others
- Created the proposal for Oxford's first MSc on Energy Systems
- Funding from H2020, EPSRC, Innovate UK, ESRC, TSB, Fell Fund and industrial partners

Centre for Energy Policy and Technology

2009 – 2013

UKERC PhD studentship

Imperial College London

- Developed new models on the future system value of storage, now established in UK policy
- Presented policy recommendations to the Energy and Climate Change Select Committee
- U.S. DOE Hydrogen Challenge award and presentation in Washington D.C.

Oerlikon Solar

2006 – 2008

Senior Management, Technology Lead, Photovoltaics

Trübach, Switzerland

- International equipment R&D (>\$5m) and accounts manager for leading PV manufacturers

Exitech Ltd.

2000 – 2006

Marie Curie Fellow, Senior Researcher, Advanced Lithography and Photovoltaics

Oxford, UK

- Established Exitech as a global leader for PV laser processing machine tools
- Developed world's first commercial 13nm EUV micro-stepper (\$20m) for Intel with a four-man team
- Led team of 12 through acquisition and negotiations with PricewaterhouseCoopers

World cycle trip 2001 – 2002
Career break: 10,000 miles via Middle East and Asia (21 countries) UK to New Zealand

Laser Zentrum Hannover e.V. 1999 – 2000
Scientific Assistant: 157nm Excimer laser system development Hannover, Germany

EDUCATION

Energy Futures Lab 2008 – 2009
MSc in Sustainable Energy Futures Imperial College London

Wedel University of Applied Sciences 1995 – 1999
Diplom Wirtschafts-Ingenieur (FH) Wedel, Germany and Budapest, Hungary

German Navy 1994 – 1995
Signalman - Morse, semaphore and boat-to-boat communication Minesweeper Frankenthal

Herderschule Gymnasium 1988 – 1994
Secondary school - Physics, Maths, Geography and English A-levels Rendsburg, Germany

PROFESSIONAL AND PERSONAL RECOGNITIONS

Expert adviser to the Department of Business, Industry and Industrial Strategy 2020

Appointed Senior Member of the Oxford Energy Society 2019

Appointed Senior Member of Oriel College Boat Club 2018

Vice Chancellor's award for innovation, Early Career, High commendation 2017

Recognition of Excellence, School of Geography and the Environment 2016

Appointed Fellow of the Institution of Civil Engineers (FICE) by presidential appointment 2015

EPSRC Early Career Fellowship 2015

Volunteer Coach, Queen's Award for volunteering for Falcon Boat Club 2012

nPower graduate challenge winner at Wembley, voted by RWE/npower board 2009

UK Energy Research Center Interdisciplinary PhD Studentship 2008

Blue Peter badge holder 2003

EU Marie Curie Fellow 2000

President of Rendsburger Primaner Ruderclub v. 1880 1993

ATTRIBUTES AND TECHNICAL SKILLS

Strategy Develop innovative solutions for long term challenges to energy system transitions

Projects Track record of managing commercial and academic projects of high value and complexity

Leadership Extensive experience of leading highly creative teams and supporting staff/students

Research Cross disciplinary collaborator in social and physical sciences and with commercial partners

Programming Proficient in data science, web development, cloud computing, machine learning and app development. (Python, JS, C, php, SQL, etc.)

PERSONAL

Languages German, English (fluent)

Status Married, two children

Interests Rowing: Henley competitor. Henley Masters winner. Torpids & Summer Eights Headship
 Coaching: at Junior level (National Finalists) and College level (Blades).
 Cross country & Rollerskiing: regular Engadin Ski Marathon participant.
 Making stuff: bread, woodwork, tools

- [1] Phil Grunewald, Marko Aunedi, Seyyed Mostafa Nosratabadi, Thomas Morstyn, Iacopo Savelli, Volkan Kumtepel, and David Howey. Taking the long view on short-run marginal emissions: how much carbon does flexibility and energy storage save? *Oxford Open Energy*, 07 2023.
- [2] Marvin Gleue, Jens Unterberg, Andreas Löschel, and Philipp Grünewald. Does demand-side flexibility reduce emissions? Exploring the social acceptability of demand management in Germany and Great Britain. *Energy Research & Social Science*, 82:102290, 2021.
- [3] Aven Satre-Meloy, Marina Diakonova, and Philipp Grünewald. Cluster analysis and prediction of residential peak demand profiles using occupant activity data. *Applied Energy*, 260:114246, 2020.
- [4] Phil Grünewald and Theresa Reisch. The trust gap: Social perceptions of privacy data for energy services in the United Kingdom. *Energy Research & Social Science*, 68:101534, 2020.
- [5] Phil Grünewald and Marina Diakonova. Societal differences, activities, and performance: Examining the role of gender in electricity demand in the United Kingdom. *Energy Research & Social Science*, 69:101719, 2020.
- [6] Phil Grünewald and Marina Diakonova. The specific contributions of activities to household electricity demand. *Energy and Buildings*, 204:109498, 2019.
- [7] Aven Satre-Meloy, Marina Diakonova, and Philipp Grünewald. Daily life and demand: an analysis of intra-day variations in residential electricity consumption with time-use data. *Energy Efficiency*, Apr 2019.
- [8] José Luis Ramirez-Mendiola, Philipp Grünewald, and Nick Eyre. Residential activity pattern modelling through stochastic chains of variable memory length. *Applied Energy*, 237:417 – 430, 2019.
- [9] Phil Grunewald and Marina Diakonova. The electricity footprint of household activities – implications for demand models. *Energy and Buildings*, 174:635 – 641, 2018.
- [10] Carissa Véliz and Philipp Grunewald. Protecting data privacy is key to a smart energy future. *Nature Energy*, page 1, 2018.
- [11] Philipp Grunewald and Marina Diakonova. Flexibility, dynamism and diversity in energy supply and demand: A critical review. *Energy Research & Social Science*, 38:58 – 66, 2018.
- [12] José Luis Ramirez-Mendiola, Philipp Grünewald, and Nick Eyre. Linking intra-day variations in residential electricity demand loads to consumers’ activities: What’s missing? *Energy and Buildings*, 161:63 – 71, 2018.
- [13] Nick Eyre, Sarah J. Darby, Philipp Grünewald, Eoghan McKenna, and Rebecca Ford. Reaching a 1.5C target: Socio-technical challenges for a rapid transition to low carbon electricity systems. *The Royal Society. Philosophical Transactions A.*, 2017.
- [14] José Luis Ramirez-Mendiola, Philipp Grünewald, and Nick Eyre. The diversity of residential electricity demand – A comparative analysis of metered and simulated data. *Energy and Buildings*, 2017.
- [15] Eoghan McKenna, Sarah Higginson, Philipp Grunewald, and Sarah J Darby. Simulating residential demand response: Improving socio-technical assumptions in activity-based models of energy demand. *Energy Efficiency*, pages 1–15, 2017.
- [16] Paul E Dodds, Iain Staffell, Adam D Hawkes, Francis Li, Philipp Grünewald, Will McDowall, and Paul Ekins. Hydrogen and fuel cell technologies for heating: A review. *International Journal of Hydrogen Energy*, 2015.

- [17] Eoghan McKenna, Philipp Grünewald, and Murray Thomson. Going with the wind: temporal characteristics of potential wind curtailment in Ireland in 2020 and opportunities for demand response. *IET Renewable Power Generation*, pages 1–12, 2014.
- [18] Jacopo Torriti and Philipp Grunewald. Demand Side Response: Patterns in Europe and Future Policy Perspectives under Capacity Mechanisms. *Economics of Energy & Environmental Policy*, 3(1), 2014.
- [19] Philipp Grünewald and Jacopo Torriti. Demand response from the non-domestic sector: early UK experiences and future opportunities. *Energy Policy*, 61(0):423–429, 2013.
- [20] Philipp H. Grünewald, Timothy T. Cockerill, Marcello Contestabile, and Peter J.G. Pearson. The socio-technical transition of distributed electricity storage into future networks — System value and stakeholder views. *Energy Policy*, 50(0):449 – 457, 2012. Special Section: Past and Prospective Energy Transitions - Insights from History.
- [21] Philipp Grünewald, Tim Cockerill, Marcello Contestabile, and Peter Pearson. The role of large scale storage in a GB low carbon energy future: Issues and policy challenges. *Energy Policy*, 39(9):4807–4815, 9 2011.
- [22] J. R. Hayes, Joanne C. Flanagan, Tanya M. Monro, D. J. Richardson, P. Grunewald, and R. Allott. Square core jacketed air-clad fiber. *Optics Express*, 14(22):10345–10350, 2006.
- [23] M Booth, O Brisco, A Brunton, J Cashmore, P Elbourn, G Elliner, M Gower, J Greuters, P Grunewald, R Gutierrez, et al. High-resolution EUV imaging tools for resist exposure and aerial image monitoring. In *Micro lithography 2005*, pages 78–89. International Society for Optics and Photonics, 2005.

PEER REVIEWED CONFERENCE PUBLICATIONS

- [1] Marina Diakonova and Phil Grünewald. Better off with less (energy)? Household activities during interventions. *eceee 2019 Summer Study Proceedings*, 2019.
- [2] Aven Satre-Meloy, Marina Diakonova, and Philipp Grünewald. What makes you peak? Cluster analysis of household activities and electricity demand. *eceee Summer Study Proceedings*, (4-291-19):745–755, 2019.
- [3] Phil Grunewald, Marina Diakonova, and Aven Satre-Meloy. Diversity behind the meter - machine learning from household activities. Technical report, BIEE 12th Academic Conference, 2018.
- [4] Aven Satre-Meloy, Marina Diakonova, and Philipp Grünewald. Daily life and demand: New data on behavioral drivers of residential electricity use patterns. *ACEEE Summer Study on Energy Efficiency in Buildings, Asilomar, CA*, 2018.
- [5] Philipp Grünewald, Marina Diakonova, Davide Zilli, Jessica Bernard, and Adriano Matousek. What we do matters – a time-use app to capture energy relevant activities. *eceee 2017 Summer Study Proceedings*, pages 2085–2093, 2017.
- [6] Phil Grunewald. Storage - what could possibly go wrong? *BIEE conference, 21-22 September 2016, Oxford*, 2016.
- [7] Phil Grunewald, José Luis Ramirez Mendiola, and Kevin Lane. Residential Demand Modelling – Time to get flexible. *BEHAVE 2016 4th European Conference on Behaviour and Energy Efficiency Coimbra, 8-9 September 2016*, 2016.
- [8] M Topouzi, P Grunewald, J Gershuny, and T Harms. Everyday household practices and electricity use: Early findings from a mixed-method approach to assign demand flexibility. *BEHAVE, 4th European Conference on Behaviour and Energy Efficiency. Coimbra, 8-9 September 2016* 2016.

- [9] Phil Grünewald. Flexibility in supply and demand. *DEMAND Centre Conference, Lancaster*, 13-15 April 2016.
- [10] Phil Grünewald and Russell Layberry. Measuring the relationship between time-use and electricity consumption. *ecce 2015 Summer Study Proceedings*, pages 2087 – 2096, 2015.
- [11] Philipp Grünewald and Jacopo Torriti. Any response? How demand response could be enhanced based on early UK experience. *11th International Conference on the European Energy Market EEM14*, 2014.
- [12] Philipp Grünewald, Jo Hamilton, Ruth Mayne, and Beaudry Kock. How Communities Generate and Distribute value - an Analytical Business model Framework for Energy Initiatives. *Behave2014, Oxford*, 2014.
- [13] Philipp Grünewald. Demand response for system balancing: Experience and future potential. *European Demand Response and Dynamic Pricing Conference. London. 24–25 June*, 2013.
- [14] Philipp Grünewald and Jacopo Torriti. Demand response – a different form of distributed storage? *IEEE International Conference on Smart Grid Technology, Economics and Policies. Nuremberg.*, 2012.
- [15] Philipp Grünewald. Electricity storage in future GB networks—A market failure? Conference paper and presentation, BIEE 9th Academic Conference, Oxford 19–20 September 2012, 2012.
- [16] Philipp Grünewald. Consumer capacity charging: the effect of ‘not paying for energy’ on an active demandside. Energy and people: futures, complexity and challenges conference, 20–21 September. Lady Margaret Hall, Oxford, 2011.
- [17] Philipp Grünewald. Techno-Economics of Distributed Generation and Storage of Solar Hydrogen. Conference paper and presentation, 18th World Hydrogen Energy Conference. 16–21 May 2010, Essen, Germany, 2010.
- [18] Philipp Grünewald. Laser Processing Technologies For Thin-Film Solar Cells. *69th JLPS conference, Tokyo*, 10 December 2007.
- [19] H. J. Booth, P. H. Grunewald, and J. E. A. Pedder. Laser micro-processing for industrial production applications. In *2007 Quantum Electronics and Laser Science Conference, QELS*, Baltimore, MD, United States, 2007. Institute of Electrical and Electronics Engineers Inc., Piscataway, NJ 08855-1331, United States.
- [20] J. Cashmore, M. Gower, P. Gruenewald, D. Karnakis, and M. Rizvi, N.andWhitfield. High resolution micromachining using short wavelength and short pulse lasers. In *4th Pacific Rim Conference on Lasers and Electro-Optics*, volume 1, pages 292–293, Chiba, 2001.
- [21] M. Gower, J. Cashmore, and P. Whitfield, M.andGruenewald. High-resolution 157-nm imaging for lithography and micromachining applications. In *Second International Symposium on Laser Precision Microfabrication*, volume 4426, pages 401–7, Singapore, 2001. SPIE-Int. Soc. Opt. Eng.

BOOK CHAPTERS

- [1] Phil Grunewald and Marina Diakonova. Chapter 3.1 - Energy and enjoyment: The value of household electricity consumption. In Marta Lopes, Carlos Henggeler Antunes, and Kathryn B. Janda, editors, *Energy and Behaviour*, pages 263 – 281. Academic Press, 2020.
- [2] P. Grünewald and A. Hawkes. (2014) *The role of hydrogen and fuel cells in providing affordable, secure low-carbon heat.*, chapter 6: Residential fuel cell micro-CHP case studies. H2FC SUPERGEN, London, UK., 2014.

COMMENTS

- [1] Philipp Grunewald. Model for a fairer distribution. *Nature Energy*, 2(17130), 2017.
- [2] Philipp Grünewald, Sarah Darby, and Jacopo Torriti. Creating the right environment for demand-side response. Consultation response Ofgem 64/13, University of Oxford and University of Reading, <https://www.ofgem.gov.uk/ofgem-publications/84130/readingoxfordresponse.pdf>, 2013.

PATENT

- [1] Philipp Grunewald. Method for Laser Scribing of Solar Panels. US 2008/0237189 A1 (Patent), OC-Oerlikon Balzers AG., 2008.