

DR PHIL GRÜNEWALD, FICE

DEPARTMENT OF ENGINEERING SCIENCE, UNIVERSITY OF OXFORD

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EXPERIENCE

Department of Engineering Science

2020 – present

Oxford Martin Fellow

University of Oxford

- Lead Researcher on the ReNEW study (Reconfiguring Energy Needs, Equity and Wellbeing)
- Coordinating data collection and repository for longitudinal high resolution smart meter data
- Recruited 200 participants and conduct demand side flexibility interventions

Oriel College

2017 – present

Jackson Junior Research Fellow and College Tutor

University of Oxford

- Tutor for Engineering in Society. Ethics, Technology Strategy, Sustainability
- Lecturer on energy demand, flexibility and storage
- Senior Member, Oriel College Boat Club

2018 – 2021

Oxford Energy Network

2013 – present

Coordinator, Deputy Director, Network Lead, Steering Group

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. Team with PostDoc, 4 DPhils and 8 interns
- Vice Chancellor's award for innovative research. Recognition of excellence by the Department.
- Pioneered novel time use data collection to explain household energy demand and flexibility
- 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

- Pioneering work 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

- Made Exitech a global leader for PV laser processing equipment
- Developed world's first commercial 13nm EUV micro-stepper (\$20m) for Intel with a four-man team
- Led team of 12 through acquisition and redundancy procedures

World cycle trip	2001 – 2002
<i>Career break: 10,000 miles via Middle East and Asia</i>	<i>UK to New Zealand</i>
Laser Zentrum Hannover e.V.	1999 – 2000
<i>Scientific Assistant: 157nm Excimer laser system development</i>	<i>Hannover, Germany</i>

EDUCATION

Energy Futures Lab	2008 – 2009
<i>MSc in Sustainable Energy Futures</i>	<i>Imperial College London</i>
Wedel University of Applied Sciences	1995 – 1999
<i>Diplom Wirtschafts-Ingenieur (FH)</i>	<i>Wedel, Germany and Budapest, Hungary</i>
German Navy	1994 – 1995
<i>Signalman - Morse, semaphore and boat-to-boat communication</i>	<i>Minesweeper Frankenthal</i>
Herderschule Gymnasium	1988 – 1994
<i>Secondary school - Physics, Maths, Geography and English A-levels</i>	<i>Rendsburg, Germany</i>

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	2003
EU Marie Curie Fellowship	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). XC & Rollerskiing: regular Engadin Ski Marathon participant. Making stuff: bread, woodwork, tools

- [1] 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.
- [2] 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.
- [3] 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.
- [4] 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.
- [5] Phil Grünewald and Marina Diakonova. The specific contributions of activities to household electricity demand. *Energy and Buildings*, 204:109498, 2019.
- [6] 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.
- [7] 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.
- [8] Phil Grunewald and Marina Diakonova. The electricity footprint of household activities - implications for demand models. *Energy and Buildings*, 174:635 – 641, 2018.
- [9] Carissa Véliz and Philipp Grunewald. Protecting data privacy is key to a smart energy future. *Nature Energy*, page 1, 2018.
- [10] 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.
- [11] 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.
- [12] 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.
- [13] 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.
- [14] 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.
- [15] 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.
- [16] Philipp Grünewald, Eoghan McKenna, and Murray Thomson. Keep it simple: time-of-use tariffs in high-wind scenarios. *IET Renewable Power Generation*, 9(2):176–183, 2014.

- [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.
- [24] A. Brunton, J. Cashmore, P. Elbourn, G. Elliner, M. Gower, P. Grunewald, M. Harman, S. Hough, N. McEntee, S. Mundair, D. Rees, P. Richards, V. Truffert, I. Wallhead, and M. Whitfield. High-resolution EUV Microstepper tool for resist testing and technology evaluation. In *Emerging Lithographic Technologies VIII*, volume 5374, pages 869–880, Santa Clara, CA, United States, 2004. The International Society for Optical Engineering, Bellingham, United States.

PEER REVIEWED CONFERENCE PUBLICATIONS

- [1] Phil Grünewald. Distributed data for distributed power. How data ownership and feedback can enable change. *eceee 2021 Summer Study Proceedings*, (7-338-22), 2021.
- [2] Marina Diakonova and Phil Grünewald. Better off with less (energy)? Household activities during interventions. *eceee 2019 Summer Study Proceedings*, 2019.
- [3] 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.
- [4] Phil Grunewald, Marina Diakonova, and Aven Satre-Meloy. Diversity behind the meter - machine learning from household activities. Technical report, BIEE 12th Academic Conference, 2018.
- [5] 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.
- [6] 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.

- [7] Phil Grunewald. Storage - what could possibly go wrong? *BIEE conference, 21-22 September 2016, Oxford*, 2016.
- [8] 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.
- [9] 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.
- [10] Phil Grünewald. Flexibility in supply and demand. *DEMAND Centre Conference, Lancaster, 13-15 April 2016*.
- [11] Phil Grünewald and Russell Layberry. Measuring the relationship between time-use and electricity consumption. *eceee 2015 Summer Study Proceedings*, pages 2087 – 2096, 2015.
- [12] 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.
- [13] 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.
- [14] Philipp Grünewald. Demand response for system balancing: Experience and future potential. *European Demand Response and Dynamic Pricing Conference. London. 24-25 June, 2013*.
- [15] 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.
- [16] 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.
- [17] 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.
- [18] 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.
- [19] Philipp Grünewald. Laser Processing Technologies For Thin-Film Solar Cells. *69th JLPS conference, Tokyo*, 10 December 2007.
- [20] 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, QEELS*, Baltimore, MD, United States, 2007. Institute of Electrical and Electronics Engineers Inc., Piscataway, NJ 08855-1331, United States.
- [21] 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.
- [22] 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. Grunewald 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 Grunewald, 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.