# Dr Phil Grünewald, FICE

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## Experience

**Department of Engineering Science** *April 2021 – Present*
*Oxford Martin Fellow* *University of Oxford*

- Lead Researcher on ReNEW Project (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*
*Career break: 10,000 miles via Middle East and Asia* *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 Witschafts-Ingenieur (FH)* *Wedel, Germany and Budapest, Hungary*

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

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

## Professional and Personal Recognitions

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| Expert adviser to 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

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| **Languages** | German, English (fluent) |
| **Status** | Married, two children |
| **Interests** | Rowing: Henley competitor. Henley Masters winner. Torpids & Summer Eights Headship<br>Coaching: at Junior level (National Finalists) and College level (Blades).<br>XC & Rollerskiing: regular Engadin Ski Marathon participant.<br>Making stuff: bread, woodwork, tools |

## Journal Publications


[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 *Microlithography 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.

## 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, 4thEuropean 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, $18^{th}$ World Hydrogen Energy Conference. 16–21 May 2010, Essen, Germany, 2010.

[19] Philipp Grünewald. Laser processing technologies for thin-film solar cells. *$69^{th}$ 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, QELS*, 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. 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.