

Professor Robert Gross BSc MSc DIC PhD



DOB 8 April 1971

Overview

Professor of Energy Policy and Technology at Imperial College London. Director of the UK Energy Research Centre, an £18m consortium funded by the UK Research Councils. Former Director of the Centre for Energy Policy and Technology and Policy Director of the Energy Futures Lab, Imperial College. I have been a Co-Director of the UK Energy Research Centre since 2004. Wide ranging and highly cited publications on energy policy, economics and technological innovation and extensive teaching experience. Substantial experience of advice and engagement with policymaking. Wide ranging consultancy experience and engagement with industry, NGOs and international organisations.

Policy inputs

I have published extensively on energy policy and technology, developing evidence-based approaches and adapting best practice in systematic review to suit energy topics. As a result, my outputs have been cited, published alongside, or featured in more than 20 reports from government agencies and bodies and I have made a substantive contribution to UK energy policy development. Recent examples include input to the UK Government White Paper on Energy and Green Jobs Taskforce. Other examples include the Committee on Climate Change reports; *the Road to Net Zero, 2018 Progress Report, Next Steps for UK Heat* and *Fifth Carbon Budget*. I am a member of the Academic Advisory Committee for the energy and gas regulator, Ofgem. In 2014-15 I was commissioned by the Committee on Climate Change to Chair Advisory Groups overseeing research into cost reduction strategies for offshore wind and CCS technologies. During 2013 and 2014 I was a member of the Expert Commission for Energy in an Independent Scotland. During 2011 and 2012 I was Specialist Advisor to the Energy and Climate Change Select Committee scrutiny of the draft Energy Bill (now Act). I attended the Secretary of State for Energy and Climate Change's Council of Economic Advisors and was on the DECC Academic Advisory Committee on Electricity Market Reform. In 2008 I acted as Specialist Advisor to the House of Lords Committee on the European Union scrutiny of the proposed 2020 renewable energy target. In 2007 I contributed to the Commission on Environmental Markets and Economic Performance, report published by BERR, Defra and DIUS. I was author of several inputs to the 2004 DTI Renewables Innovation Review. From January 2001 to November 2001 I was seconded to the Performance and Innovation Unit (PIU) in the Cabinet Office and co-authored the 2002 Strategic Energy Review focusing on prospective cost reductions in low carbon technologies. I also co-authored the PIU Resource Productivity Report.

Apart from citation by government departments, my work has informed Parliamentary Committees, non-departmental public bodies such as the Committee on Climate Change, National Infrastructure Commission and National Audit Office, and international bodies such as the International Energy Agency.

Stakeholder engagement and media

Currently a Fellow and Council Member of the Energy Institute, which holds a Royal Charter as the membership organisation for energy professionals. I am a Member of the Council of the British Institute of Energy Economics and was BIEE Chair in 2014. I have undertaken research and consultancy for diverse organisations and companies from oil companies and UK utilities, to the UNDP, World Bank and NGOs. I have been invited speaker at a wide range of international energy policy workshops and other events, including engagement with senior policymakers in China, Japan, Mexico, Singapore, various EU countries, and in the US. I make regular contributions to the popular debate surrounding energy, for example through appearances on the Today Programme, BBC TV news, Sky TV News C4 News and others. I provide comments and makes regular contributions to the FT, Guardian, Independent, BBC online and leading blogs such as Carbon Brief and Business Green. I recently hosted UKERC's first podcast and helped to create Imperial College's first mass online learning course (MOOC) on clean energy. I also have extensive experience of stakeholder engagement and consultation, having run innumerable workshops and consultative events for a wide range of stakeholders.

Career history

Current: Professor of Energy Policy and Technology, Imperial College London

2014 – 2020: Reader in Energy Policy and Technology, Imperial College London

2010 – 2013: Senior Lecturer in Energy Policy and Technology, Imperial College London

2006 – 2010: Lecturer in Energy Policy and Technology, Imperial College London

2002 – 2006: Research Fellow, Centre for Energy Policy and Technology, Imperial College London

1999 – 2002: Research Associate, Dept. Environmental Science and Technology, Imperial College London

2001 – 2002: Analyst (seconded), Performance and Innovation Unit (latterly No. 10 Strategy Unit), Cabinet Office, HMG London

1996 – 1998: Communications Manager, 'RENUe' (Renewable Energy in the Urban Environment, subsequently Sustainable Energy Action, now defunct).

Professional Experience: Roles and responsibilities

Director, UK Energy Research Centre 2020 - current

Policy Director, Imperial College Energy Futures Lab, 2011 – 2020

Thesis Term Director, MSc Environmental Technology, 2010 – 2020

Co-Director, UK Energy Research Centre, 2004 – 2020

Economics and Policy Module founder and convenor, MSc Sustainable Energy Futures, 2010 – 2020

MSc Management Committee Member, MSc Environmental Technology, 2010 – current

Director, Centre for Energy Policy and Technology, 2010 – current

Energy Policy Option Convenor, MSc Environmental Technology, 2003 – 2012

Professional Affiliations

Energy Institute: Fellow and member of Council. Chair of Energy Advisory Panel

British Institute for Energy Economics (BIEE): Council member and former Chair

Education

PhD: Imperial College, 2008

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MSc: Environmental Technology, Imperial College, 1998

BSc (Hons): Combined Studies - Economics and Philosophy, the University of Hertfordshire. 1992

Grants and Awards 2008 – 2021

UKERC (UK Energy Research Centre) Phase 4 (EPSRC), 2019 – 2024: £22m FEC Director (PI)
NUEPA – network utilisation, engineering and public acceptance for low carbon heat (EPSRC), 2020 – 2023: £1.5m (PI)
IDLES, EPSRC 2018 – 2023: £7m (Co-I)
Renewable Energy Technologies, Corporation of Lloyd's, 2018 – 2019: £40k (PI)
UKERC Technology and Policy Assessment Phase 3, EPSRC, 2014 – 2019: £15m (CoI)
UKERC Technology and Policy Assessment Phase 2, NERC, 2009 – 2014: £18.5m (CoI)
UKERC Technology and Policy Assessment Phase 1 NERC, 2004 – 2009: £14m (CoI)
Low Carbon Pathways Report, European Climate Foundation, 2014 – 2015: £65k (PI)
Decarbonisation of Heat, European Climate Foundation 2015 – 2016: £140k (PI)
UK-UAE-IRENA Low Carbon Energy Policy Collaboration, 2010 – 2014: £500k (PI)
EPSRC Hubnet Supergen Consortium, 2015 – 2016: £70k (CoI)
EPSRC Networks Grand Challenge 'Top and Tail,' 2011 – 2015: £110k (CoI)
EPRSC PV21 Photovoltaics Supergen, 2006 – 2012: (CoI)
Coal, a policy own goal report, WWF, 2013 – 2014: £34k (PI)
Innovation timelines and low carbon heat reports, CCC, 2015 – 2016: £20k (PI)
UK Biomass resource report, DECC, 2011: £30k (PI)
On Picking Winners report, WWF, 2012: £25k (PI)
BP Energy Sustainability Challenge, Tech Innovation strand, 2010 – 2012: £52k (PI)

Research staff and PhD students

I have a research group comprising 6 full time researchers and 2 PhD students. I also manage UKERC's secretariat comprising 6 professional services staff. UKERC has more than 100 research and academic staff located across 20 participating university.

Stats

Google Scholar H index - 32: I10 index - 49: Citations – 6233 (August 2021). I have authored over 100 reports and papers.

Academic Papers

N Johnson, R Gross, I Staffell, 2021

[Stabilisation wedges: measuring progress towards transforming the global energy and land use systems](#)

Environmental Research Letters 16 (6), 064011

R Carmichael, R Gross, R Hanna, A Rhodes, T Green, 2021

[The Demand Response Technology Cluster: Accelerating UK residential consumer engagement with time-of-use tariffs, electric vehicles and smart meters via digital comparison tools](#)

Renewable and Sustainable Energy Reviews 139, 110701

R Hanna, R Gross, 2020

[How do energy systems model and scenario studies explicitly represent socio-economic, political and technological disruption and discontinuity? Implications for policy and ...](#)

Energy Policy 149, 111984

PJ Heptonstall, RJK Gross

[A systematic review of the costs and impacts of integrating variable renewables into power grids](#)

Nature Energy 6 (1), 72-83

S Kozarcanin, R Hanna, I Staffell, R Gross, GB Andresen

[Impact of climate change on the cost-optimal mix of decentralised heat pump and gas boiler technologies in Europe](#)

Energy Policy 140, 111386

Parrish B, Gross R, Heptonstall P, 2019

[On demand: Can demand response live up to expectations in managing electricity systems?](#) *Energy Research and Social Science*, Vol: 51, Pages: 107-118, ISSN: 2214-6296 [Abstract](#) [Open Access Link](#)

Gross R, Hanna R, 2019

[Path dependency in provision of domestic heating](#), *Nature Energy*, Vol: 4, Pages: 358-364, ISSN: 2058-7546 [Abstract](#)

[Open Access Link](#)

Gross R, Hanna R, Gambhir A, Heptonstall P, Speirs J [et al.](#), 2018

[How long does innovation and commercialisation in the energy sectors take? Historical case studies of the timescale from invention to widespread commercialisation in energy supply and end use technology](#), *ENERGY POLICY*, Vol: 123, Pages: 682-699, ISSN: 0301-4215 [Author Web Link](#) [Open Access Link](#)

Holland RA, Beaumont N, Hooper T, Austen M, Gross RJK, Heptonstall PJ, Ketsopoulou I, Winskel M, Watson J, Taylor [Get al.](#), 2018, [Incorporating ecosystem services into the design of future energy systems](#), *APPLIED ENERGY*, Vol: 222, Pages: 812-822, ISSN: 0306-2619

Armstrong, R. C., Wolfram, C., de Jong, K. P., Gross, R., Lewis, N. S., Boardman, B., . . . Ramana, M. V. (2016). The frontiers of energy. *NATURE ENERGY*, 1, 8 pages. doi:[10.1038/NENERGY.2015.20](https://doi.org/10.1038/NENERGY.2015.20)

Blyth W, McCarthy R, Gross R, 2015, Financing the UK power sector: Is the money available? *ENERGY POLICY*, Vol: 87, Pages: 607-622, ISSN: 0301-4215

Watson J, Gross R, Ketsopoulou I, 2015, Energy policy special issue: UK Energy Research Centre uncertainties project, *ENERGY POLICY*, Vol: 87, Pages: 604-606, ISSN: 0301-4215

Watson J, Gross R, Ketsopoulou I, Winskel Met al., 2015, The impact of uncertainties on the UK's medium-term climate change targets, *ENERGY POLICY*, Vol: 87, Pages: 685-695, ISSN: 0301-4215


Boot-Handford ME, Abanades JC, Anthony EJ, Blunt MJ, Brandani S, Mac Dowell N, Fernandez JR, Ferrari M-C, Gross R, [et al.](#), 2014, [Carbon capture and storage update](#), *ENERGY & ENVIRONMENTAL SCIENCE*, Vol: 7, Pages: 130-189, ISSN: 1754-5692

Houari Y, Speirs J, Candelise C, Gross [Ret al.](#), 2014, [A system dynamics model of tellurium availability for CdTe PV](#), *PROGRESS IN PHOTOVOLTAICS*, Vol: 22, Pages: 129-146, ISSN: 1062-7995

Mawhood R, Gross R, 2014, [Institutional barriers to a 'perfect' policy: A case study of the Senegalese Rural Electrification Plan](#), *ENERGY POLICY*, Vol: 73, Pages: 480-490, ISSN: 0301-4215

Slade R, Bauen A, Gross R, 2014, [Global bioenergy resources](#), *NATURE CLIMATE CHANGE*, Vol: 4, Pages: 99-105, ISSN: 1758-678X [Author Web Link](#)

Harris G, Heptonstall P, Gross R, Handley D. [Cost estimates for nuclear power in the UK](#). *ENERGY POLICY* 62:431-442 01 Nov 2013 (Journal article) [Author URL](#)  

Candelise C, Winskel M, Gross RJK. [The dynamics of solar PV costs and prices as a challenge for technology forecasting](#). RENEWABLE & SUSTAINABLE ENERGY REVIEWS 26:96-107 01 Oct 2013 (Journal article) [Author URL](#)  [doi>](#)

Hughes N, Strachan N, Gross R, 2013, The structure of uncertainty in future low carbon pathways, *Energy Policy*, Vol:52, ISSN:0301-4215, Pages:45-54 [DOI](#)

Chignell S, Gross RJK, Not locked-in? The overlooked impact of new gas-fired generation investment on long-term decarbonisation in the UK, *Energy Policy*, 2013, Vol:52, ISSN:0301-4215, Pages:699-705 [DOI](#)

Speirs J, Contestabile M, Houari Y, Gross R [et al.](#), 2014, [The future of lithium availability for electric vehicle batteries](#), RENEWABLE & SUSTAINABLE ENERGY REVIEWS, Vol: 35, Pages: 183-193, ISSN: 1364-0321

Philip Heptonstall, Robert Gross, Philip Greenacre, Tim Cockerill, The cost of offshore wind: Understanding the past and projecting the future, *ENERGY POLICY* (2012)41 815–821

Rob Saunders, Robert Gross, Joanne Wade, Can premium tariffs for micro-generation and small scale renewable heat help the fuel poor, and if so, how? Case studies of innovative finance for community energy schemes in the UK *ENERGY POLICY* (2012) Vol:42, Pages:78-88, ISSN:0301-4215([publication doi](#))

Candelise, C, Speirs, J, Gross, R, Materials availability for thin film (TF) PV technologies development: a real concern? *RENEWABLE AND SUSTAINABLE ENERGY REVIEWS* 1 (2011) 5, pp. 4972-4981 DOI information: 10.1016/j.rser.2011.06.012

Raphael Slade, Robert Gross, Ausilio Bauen Estimating bio-energy resource potentials to 2050: learning from experience *ENERGY ENVIRON. SCI.*, (2011) DOI:10.1039/C0EE00732C

Steggals W, Gross R, Heptonstall P, Winds of change: How high wind penetrations will affect investment incentives in the GB electricity sector, *ENERGY POLICY*, 2011, Vol:39, Pages:1389-1396

Candelise, C, Gross R, Leach, M, Conditions for photovoltaics deployment in the UK: the role of policy and technical developments, *PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS, PART A: JOURNAL OF POWER AND ENERGY*. 2010, 10.1243/09576509JPE837

Gross, R, Blyth, W, Heptonstall, P, Risks, Revenues and Investment in Electricity Generation: Why Policy Needs to Look Beyond Costs *ENERGY ECONOMICS*. 10-NOV-2009 *ENEEO1847* DOI information: 10.1016/j.eneco.2009.09.017

Collins CP, Gross R & Heptonstall P, Is there an 'Energy Gap'? Energy, *PROCS OF THE INSTITUTE OF CIVIL ENGINEERS*, Nov 2008, Is EN4, Pages: 145 – 157

Gross, R, Heptonstall, P, The costs and impacts of intermittency: An ongoing debate *Energy Policy*, Volume 36, Issue 10, October 2008, Pages 4005-4007

Skea, J, Anderson, D, Green, T, Gross, R et al, Intermittent renewable generation and maintaining power system reliability, *GENERATION, TRANSMISSION & DISTRIBUTION*, Vol: 2, Pages: 82 - 89, ISSN: 1751-8695

Gross, R, Heptonstall, P, Renewables and the grid: understanding intermittency, *ENERGY Vol., no. 1*, Vol: 160, Pages: 31 – 41 (winner of the Institute of Civil Engineers Telford Premium prize for best paper, 2008)

Gross R, Heptonstall P, The problem of intermittency: overrated or understated? *Modern Power Systems*, 2006, Vol:26, Pages:30-31, ISSN:0260-7840

Foxon TJ, Gross R, Chase A, [et al](#), UK innovation systems for new and renewable energy technologies: drivers, barriers and systems failures, *ENERGY POLICY*, 2005, Vol:33, Pages:2123-2137, ISSN:0301-4215([publication doi](#))

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Gross R, Technologies and innovation for system change in the UK: status, prospects and system requirements of some leading renewable energy options, *ENERGY POLICY*, 2004, Vol:32, Pages:1905-1919, ISSN:0301-4215([publication doi](#))

Gross R, Leach M, Bauen A, Progress in renewable energy, *ENVIRON INT*, 2003, Vol:29, Pages:105-122, ISSN:0160-4120([doi](#))

Gross R, Foxon TJ, Policy support for innovation to secure improvements in resource efficiency, *INTERNATIONAL JOURNAL OF ENVIRONMENTAL TECHNOLOGY AND MANAGEMENT*, 2003, Vol:3, Pages:118-130

Anderson D, Gross R, 2000, [Responding to climate change: will the required energy technologies become available? Some questions for UK policies](#), Meeting of the British-Association, Publisher: ELSEVIER SCI LTD, Pages: 217-222, ISSN: 0301-4215

Books, reports and monographs

[The pathway to net zero heating in the UK](#)

J Rosenow, R Lowes, O Broad, G Hawker, J Wu, M Qadrdan, R Gross
UKERC (2020)

[The High Cost of Electricity Price Uncertainty](#)

A Ostrovnaya, I Staffell, C Donovan, R Gross
Available at SSRN 3588288 (2020)

[Disrupting the UK energy system: causes, impacts and policy implications](#)

M Winskel, M Kattirtzi, R Lowes, B Woodman, H Poulter, C Brand, G Killip, ...
Hydrogen Knowledge Centre 2019

[Modelling demand-side energy policies for climate change mitigation in the UK: a rapid evidence assessment](#)

L Hardt, P Brockway, P Taylor, J Barrett, R Gross, P Heptonstall
UKERC 2019

[Unlocking the Potential of Energy Systems Integration](#)

R Hanna, E Gazis, A Rhodes, R Gross
Imperial College London: London, UK 2018

[Technologies for meeting Clean Growth emissions reduction targets](#)

J Watson, R Gross
Written evidence from the UK Energy Research Centre to the House of Commons ... (2018)

[Landscape review of international assessments of the economic impacts of climate change](#)

K Turner, O Alabi, R Gross for the Scottish Government and Climate Exchange 2017

Heptonstall PJ, Gross R, Steiner F, 2017, The costs and impacts of intermittency - 2016 update, Publisher: UK Energy Research Centre [Publisher Web Link](#)

Hanna RF, Gross R, Parrish B, 2016, Best practice in heat decarbonisation policy: A review of the international experience of policies to promote the uptake of low-carbon heat supply

Parrish B, Heptonstall PJ, Gross R, 2016, The potential for UK residential demand side participation, [Publisher Web Link](#)

MacLean K, Gross R, Hannon M, Rhodes AR, Parrish [Bet al.](#), 2015, Energy system crossroads - time for decisions: UK 2030 low carbon scenarios and pathways - key decision points for a decarbonised energy system, ICEPT/WP/2015/019 [Publisher Web Link](#) [Author Web Link](#) [Open Access Link](#)

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Richard Hanna, Robert Gross, Jamie Speirs, Phil Heptonstall and Ajay Gambhir, Innovation timelines from invention to maturity: A review of the evidence on the time taken for new technologies to reach widespread commercialisation. December 2015, www.UKERC.ac.uk

Raphael Slade, Robert Saunders, Robert Gross, Ausilio Bauen, Energy from biomass: the size of the global resource (2011). UK Energy Research Centre, London. ISBN: 1 903144 108

Philip Greenacre Robert Gross Phil Heptonstall Great Expectations: The cost of offshore wind in UK waters – understanding the past and projecting the future UK Energy Research Centre 2010 ISBN 1 903144 0 9 4

Gross R, Anable J, Heptonstall P, [et al](#), What policies are effective at reducing carbon emissions from surface passenger transport? A review of interventions to encourage behaviour and technical change, London, Imperial College, 2009, ISBN: 1 903144078

Gross R, Blyth W, Heptonstall P, Investment in electricity generation: the role of costs, incentives and risks, London, Imperial College, 2007, ISBN: 1 903144051

Gross, R, Heptonstall, P, Anderson, D , [et al](#), The costs and impacts of intermittency, A report of the technology and policy assessment function of the UKERC, London, Imperial College, ICEPT/UKERC, 2006

Hartley N, MacKerron G, Mitchell C, Penn R, Eyre N, Gross R, Chapman [Jet al](#), 2002, The Energy Review, a report to Government by the Performance and Innovation Unit (PIU), London, Publisher: The Stationary Office [Author Web Link](#)

Anderson D, Gross R, 2002, Assessment of Technical options to address climate change, a report to the Prime Minister's Strategy Unit, London, Publisher: The strategy Unit, Cabinet Office [Author Web Link](#)

Gross R, Chapman J, 2001, Technical and economic potential of renewable energy generating technologies: Potentials and costs reductions to 2020. PIU Working Paper for the Energy Review, London, Publisher: The Cabinet Office [Author Web Link](#)

Gross R, Coates, Ian, 2001, Resource Productivity: Making more with less, a PIU report to government, London, Publisher: the Stationary Office

Anderson, D , Clark, C , Foxon, T , [et al](#), Innovation and the environment, Challenges and Policy Options for the UK., London, Published by Imperial College London, 2000, ISBN:9781903144015

Chapters

Gross R, Heptonstall P, Liberalised Energy Markets: An obstacle to renewables? In: UK Energy Policy and the End of Market Fundamentalism Critical Analysis, Editor(s): Rutledge, Wright, Oxford, Oxford University Press, 2011, ISBN:9780199593002

Gross, R, Heptonstall, P, The UKERC review of the costs and impacts of intermittency, In: Renewable Energy and the Grid: The Challenge of Variability, Editor(s): Boyle, London, Earthscan

Gross, R, Renewable energy in the UK: an Issue of scale, In: Micro Energy Systems, Editor(s): Knowles, M, Burdon, I, Beith, R, Bury St Edmonds, Professional Engineering Publishing, 2004, Pages: 9-29, ISBN:9781860584268