Jethro Browell   **Curriculum Vitae**

Address:	School of Mathematics and Statistics	Email:	jethro.browell@glasgow.ac.uk
	University Place	Web:	www.jethrobrowell.com
	Glasgow, G12 8QQ		

Positions

University of Glasgow, UK
2021– *Senior Lecturer, School of Mathematics and Statistics*
- Research in data science and statistical methodology for probabilistic forecasting and associated decision-making problems, and applications in the energy sector
- Principal and co-investigator roles on research and knowledge exchange projects, grant writing, managing and developing research staff
- Teaching and supervision at BSc, MSc and PhD level

National Grid Electricity System Operator
2023-2024 *Lead Data Scientist, Energy Forecasting Team (Secondment)*
- Knowledge transfer, innovation, and research on operational energy forecasting
- Two-year part-time (25% FTE) secondment

University of Strathclyde, Glasgow, UK
2020–2021 *Lecturer & Chancellor's Fellow/Senior Lecturer (2021)*
Dept. Electronic and Electrical Engineering
2015–2020 *Research Associate/Fellow (2017), Dept. Electronic and Electrical Engineering*
- EPSRC Innovation Fellowship 2018–2022
- Founding leader of Energy Forecasting Group
- EPSRC Doctoral Prize 2015

Education

Degrees

2011–2015 *University of Strathclyde, Glasgow, UK*
PhD: *"Spatio-temporal Prediction of Wind Fields"*
Supervisors: Dr Stephan Weiss and Prof David Infield
Structure: '1+3' EPSRC Centre for Doctoral Training
Three months as a visiting researcher at the Technical University of Denmark

2007–2011 *University of St Andrews, UK.*
MPhys (Hons), 2:1, Mathematics and Theoretical Physics
Master's Research Project: *"Magnetic Fields Containing Two Null Points and a Separator"*
Cedric Thorpe Davie Award for contribution to University musical life

Publications

Metrics Google Scholar: Citations 1475, h-index: 19
Scopus: Citations (excluding self-cite): 836, h-index: 14
jethrobrowell.com: >600 unique visitors per-month

In prep List of working papers and pre-prints is available at www.jethrobrowell.com.

Journal 1. B. Rostami-Tabar, **J. Browell**, I. Svetunkov, "Probabilistic forecasting of hourly Emergency Department arrivals", *Health Systems* (accepted), 2023

2. M. Hu, B. Stephen, **J. Browell**, S. Haben, D. Wallom, "Impacts of building load dispersion level on its load forecasting accuracy: Data or algorithms? Importance of reliability and interpretability in machine learning", *Energy and Buildings* (in press), 2023, DOI: 10.1016/j.enbuild.2023.112896

3. C. Gilbert, **J. Browell** and B. Stephen, "Probabilistic load forecasting for the low voltage network: forecast combination and daily peaks", *Sustainable Energy Grids and Networks* (in press), 2023, DOI: 10.1016/j.segan.2023.100998

4. D. Huppmann, **J. Browell**, B.Nastasi, Z. Vale, D. Süsser, "Editorial: A research agenda for open energy science: Opportunities and perspectives of the F1000Research Energy Gateway", *F1000Research*, 11:896, 2022, DOI: 10.12688/f1000research.124267.1

5. M. T. Craig, J. Wohland, L. P. Stoop, A. Kies, B. Pickering H. C. Bloomfield, **J. Browell** and co-authors, "Overcoming the disconnect between energy system and climate modeling", *Joule*, DOI: 10.1016/j.joule.2022.05.010 (in press)

6. C. Kang, **J. Browell**, M. Farrokhabadi, C. Hunag, S. Makonin, E. Nasr, W. Su, Y. Wang, and J. Xie, "Editorial: Special Section on COVID-19 Impact on Electrical Grid Operation: Analysis and Mitigation", *IEEE Open Access Journal of Power and Energy*, vol. 9, pp. 185–191, 2022 DOI: 10.1109/OAJPE.2022.3177299

7. **J. Browell** and C. Gilbert, "Predicting electricity imbalance prices and volumes: capability and opportunity", *Energies*, 15(10), 3645, 2022, DOI: 10.3390/en15103645

8. R. Tawn, **J. Browell** and D. McMillan, "Sub-seasonal-to-Seasonal forecasting for wind turbine maintenance scheduling", *Wind*, 2(2), 260–287, 2022, DOI: 10.3390/wind2020015

9. M. Farrokhabadi, **J. Browell**, Y. Wang, S. Makonin, W. Su, and H. Zareipour, "Day-Ahead Electricity Demand Forecasting Competition: Post-COVID Paradigm", *IEEE Open Access Journal of Power and Energy*, (Early Access), DOI: 10.1109/OAJPE.2022.3161101

10. **J. Browell**, C. Gilbert and M. Fasiolo, "Covariance Structures for High-dimensional Energy Forecasting", *Electric Power Systems Research (PSCC 2022 Special Issue)*, vol. 211, 108446, 10.1016/j.epsr.2022.108446, 2022

11. R.M. Graham, **J. Browell**, D. Bertram and C.J. White, "The application of sub-seasonal to seasonal (S2S) predictions for hydropower forecasting", *Meteorological Applications*, 29(1), e2047, 2022, DOI: 10.1002/met.2047

12. E. Heylen, **J. Browell** and F. Teng, "Probabilistic day-ahead inertia forecasting", *IEEE Transactions on Power Systems*, 37(5), 3738–3746, 2022 10.1109/TPWRS.2021.3134811

13. F. Petropoulos, **J. Browell**, *et al.*, "Forecasting: Theory and Practice," *International Journal of Forecasting*, (published online), DOI: 10.1016/j.ijforecast.2021.11.001 arXiv: 2012.03854

14. C.J. White, **J. Browell**, *et al.*, "Advances in the application and utility of subseasonal-to-seasonal predictions", *Bulletin of the American Meteorological Society*, DOI: 10.1175/BAMS-D-20-0224.1, (published online)

15. R. Tawn and **J. Browell**, "A review of very short-term wind and solar power forecasting," *Renewable and Sustainable Energy Reviews*, vol. 153, 111758, DOI: 10.1016/j.rser.2021.111758, 2022

16. **J. Browell** and M. Fasiolo, "Probabilistic Forecasting of regional net-load with conditional extremes and gridded NWP," *IEEE Transactions on Smart Grid*, vol. 12, no, 6, pp. 5011-5019, DOI: 10.1109/TSG.2021.3107159, 2021

17. E. Medina-Lopez, D. McMillan, J. Lazic, E. Hart, S. Zen, A. Angeloudis, E. Bannon, **J. Browell**, S. Dorling, R.M. Dorrell, R. Foster, C. Old, G.S. Payne, G. Porter, A.S. Rabaenda, B. Sellar, E. Tapoglou, N. Trifonova, I.H. Woodhouse, and A. Zampollo, "Satellite data for the offshore renewable Energy sector: synergies and innovation opportunities," *Remote Sensing of Environment*, vol. 264, 112588, DOI: 10.1016/j.rse.2021.112588, 2021

18. H.C. Bloomfield, P.L.M. Gonzalez, J.K. Lundquist, L.P. Laurens, **J. Browell**, R. Dargaville, M. De Felice, K. Gruber, A. Hilbers, A. Kies, M. Panteli, H.E. Thornton, J. Wohland, M. Zeyringer and D.J. Brayshaw, "The importance of weather and climate to energy systems: A workshop on Next Generation Challenges in Energy-Climate Modelling", *Bulletin of the American Meteorological Society (BAMS)*, 102(1), E159-E167, DOI: 10.1175/BAMS-D-20-0256.1, 2021

19. R. Telford, B. Stephen, **J. Browell** and S. Haben, "Dirichlet Sampled Capacity and Loss Estimation for LV Distribution Networks with Partial Observability," *IEEE Transaction on Power Delivery*, vol. 36, no. 5, pp. 2676–2686, DOI: 10.1109/TPWRD.2020.3025125, 2021

20. C. Gilbert, **J. Browell** and D. McMillan, "Probabilistic Access Forecasting for Improved Offshore Operations," *International Journal of Forecasting*, vol. 37, no. 1, pp. 134–150, DOI: 10.1016/j.ijforecast.2020.03.007, 2021

21. R. Tawn, **J. Browell**, and I.A. Dinwoodie, "Missing Data in Wind Farm Time Series: Properties and Effect on Forecasts," *Electric Power Systems Research (PSCC 2020 Special Issue)*, vol. 189, December 2020, 106640, DOI: 10.1016/j.epsr.2020.106640, 2020.

22. J.W. Messner, P. Pinson, **J. Browell**, M.B. Bjerregard and I. Schicker "Evaluation of Wind Power Forecasts — An up-to-date view," *Wind Energy*, 23:1461–1481, DOI: 10.1002/we.2497, 2020.

23. M. Nedd, **J. Browell**, K. Bell and C. Booth, "Containing Loss Risk in a Low Inertia GB Power System," *IEEE Transactions on Industry Applications*, vol. 6, no. 2, 1031–1039, DOI: 10.1109/TIA.2019.2959996, 2020.

24. C. Sweeney, R.J. Bessa, **J. Browell**, P. Pinson, "The Future of Forecasting for Renewable Energy," *WIREs Energy and Environment*, vol. 9, no. 2, DOI: 10.1002/wene.365, 2020.

25. C. Gilbert, **J. Browell** and D. McMillan, "Leveraging Turbine-level Data for Improved Probabilistic Wind Power Forecasting," *IEEE Transactions on Sustainable Energy*, vol. 11, no. 3, pp. 1152–1160, DOI: 10.1109/TSTE.2019.2920085, 2020.

26. C. Edmunds, S.M. Martinez, **J. Browell**, E. Gómez-Lázaro, S. Galloway, "The evolution of wind power participation in reserve and response markets in Great Britain and Spain," *Renewable and Sustainable Energy Reviews*, vol. 115, DOI: 10.1016/j.rser.2019.109360, 2019.

27. **J. Browell**, D. R. Drew and K. Philippopoulos, "Improved Very-short-term Spatio-temporal Wind Forecasting using Atmospheric Regimes," *Wind Energy*, 21(11), 968–979, DOI: 10.1002/we.2207, 2018.

28. **J. Browell**, "Risk Constrained Trading Strategies for Stochastic Generation with a Single-Price Balancing Market," *Energies*, 11(6):1345, DOI: 10.3390/en11061345, 2018.

29. R. J. Bessa, C. Möhrlen, V. Fundel, M. Siefert, **J. Browell**, S. H. El Gaidi, B-M. S. Hodge, U. Cali, "Towards Improved Understanding of the Applicability of Uncertainty Forecasts in Wind Energy," *Energies*, 10(9):1402, DOI: 10.3390/en10091402, 2017.

30. A. Malvaldi, S. Weiss, D. Infield, **J. Browell**, P. Leahy, A. Foley, "A spatial and temporal correlation analysis of aggregate wind power in an ideally interconnected Europe," *Wind Energy*, 20(8), 1315–1329, DOI: 10.1002/we.2095, 2017.

31. L. Cavalcante, R. J. Bessa, M. Reis and **J. Browell**, "Sparse Structures for Very Short-term Wind Power Forecasting," *Wind Energy*, 20(4), 657–675, DOI: 10.1002/we.2029, 2017.

32. **J. Dowell**, P. Pinson, "Very-short-term Probabilistic Wind Power Forecasts by Sparse Vector Autoregression," *IEEE Transactions on Smart Grid*, 7(2), pp. 763–770, DOI: 10.1109/TSG.2015.2424078, 2016.

33. V. M. Catterson, D. McMillan, I. Dinwoodie, M. Revie, **J. Dowell**, J. Quigley, K. Wilson, "An economic impact metric for evaluating wave height forecasters for offshore wind maintenance access," *Wind Energy*, 19(2), pp. 199–212, DOI: 10.1002/we.1826, 2015.

34. **J. Dowell**, S. Weiss, D. Hill, D. Infield, "Short-Term Spatio-Temporal Prediction of Wind Speed and Direction," *Wind Energy*, 17(12), pp. 1945–1955, DOI: 10.1002/we.1682, 2014.

In Book

1. Contributions to Parts 2 and 3 by **J. Browell**, Eds. C. Möhrlen , J. W. Zack, G. Giebel, *IEA Wind Recommended Practice for the Implementation of Renewable Energy Forecasting Solutions*, Academic Press, 270 pages, ISBN: 0443186812, 2022

2. R. Bessa, **J. Dowell**, P. Pinson, "Renewable Energy Forecasting," in *Smart Grid Handbook*, edited by C-C. Liu, S. McArthur and S-J. Lee, Chichester, UK: John Wiley & Sons Ltd, ISBN: 978-1-118-75548-8, 1900 pages, Chapter: 639–659, 2016.

Editorial   *Associate Editor: IEEE Access (2022–)*
Forecasting subject specialist for Power & Energy section of IEEE's flagship open-access journal.

Member of Advisory Board: F1000 Research Energy Gateway (2021–)
Advisory role to F1000 Research as they establish the 'Energy Gateway' section of their open-access, open-peer-review publishing offering.

Guest Editor: IEEE Open Access Journal of Power and Energy (2021–2022)
Guest editor of a special issue of OAJPE "COVID-19 Impact on Electrical Grid Operation: Analysis and Mitigation", associated with my role organising a COVID-19 electricity demand forecasting competition.

Member of the Editorial Board: Sustainable Energy, Grids and Networks (2020–present)
Editorial duties for this leading journal responsible for reviewing submissions related to energy forecasting.

Member of the Editorial Board: Renewable and Sustainable Energy Reviews (2019–present)
Editorial duties for this leading journal (top decile, impact factor 10.6) responsible for reviewing wind energy and forecasting related submissions.

Guest Editor: Renewable and Sustainable Energy Reviews (2018–2019)
Guest editor of a special issue of RSER in marine and ocean energy dedicated to the work and memory of Professor Ian Bryden.

Reviews   *Regular reviews for:*
Journal of Applied Statistics, IEEE Access, International Journal of Forecasting, Renewable & Sustainable Energy Reviews, Meteorological Applications (RMetS), IEEE Trans. Power Systems, IEEE Trans. Smart Grid, IEEE Trans. Sustainable Energy, IEEE Trans. Industrial Informatics, IEEE Power Engineering Letters, Wind Energy, Technological Forecasting and Social Change, Power Systems Computation Conference, Energies (MDPI), European Safety and Reliability Conference, IET Renewable Power Generation, WindEurope Conferences.
Recognised as outstanding reviewer for IEEE Trans. Sustainable Energy and the International Journal of Forecasting in 2022–23.

Funding and Awards

Current active projects have combined value of approximately £1m, approximately half as PI and half as Co-I.

NB: Projects labelled TIC-* refer to those funded by the University of Strathclyde's Technology and Innovation Centre's industry funded Low Carbon Power and Energy Programme.

Funding   OFGEM Strategic Innovation Framework (PI, 2022–, Discovery Phase £7k, Alpha Phase £41k of £500k project), *"Predict4Resilience"*

ETP Energy Industry Doctorate with Shell (PI, 2022–2026, £69k), *"Multi-variate forecasting for wind power integration in electricity markets"*

TNEI & National Grid ESO (PI, 2020-2021, 12 months, £60k of £400k project), *"Control REACT"*
TIC-LCPE (PI, 2020-2021, 12 month, £111k), *"Modelling Wind Power for Probabilistic Transmission System Planning"*

TIC-LCPE (Data-02) and EPSRC Supergen Energy Networks Flexfund (PI, 2019-2020, 13 month, £125k), *"Energy Forecasting for Market-led Multi-vector Networks (EnFORMM)"*

TIC-Networks-06 (Co-I, 2019-2020, 9 month, £150k), *"Operating a Zero Carbon GB Power System in 2025: Frequency and Fault Current"*

EPSRC Responsive Mode (Co-I, 2019-2021, 24 months, £700k), *"Analytical Middleware for Informed Distribution Netowrks (AMIDiNe)"*

TIC-Wind-09 (Co-I, 2019, 1 month, £16k), *"Met-ocean Access Sensor Location Study"*

TIC-Hydro-04 (PI, 2019, 8 months, £80k), *"Sub-seasonal-to-seasonal Hydro Resource Forecasting"*

OpenLV IAA (Co-I, 2019, 6 months, £12k), *"OpenLV: Low Voltage Demand Forecasting and Phase Balancing"*

EPSRC-UKRI Innovation Fellowship (PI & Fellow, 2018–2022, £310k), *"System-wide Probabilistic Energy Forecasting."*

EPSRC Supergen Wind Flexible Funding Special Projects Call (Co-I, 2018, £30k), *"Automated Video Analysis for Accurate Wave Height Measurements in Offshore Wind Farms."*

TIC-Hydro-01 (PI, 2017–2018, 6 months, £40k), *"Short to Medium Term Hydro Resource Forecasting"*

Energy Technology Partnership (PI, 2017–2018, 5 months, £20k), *"Dynamic Load Grid Modelling"*

The DataLab Industrial PhD Studentship, with Natural Power (PI, 2017–2021, £60k), *"Predictive Analytics for Short-term Wind and Solar Power Forecasting"*

Knowledge Transfer Partnership, Romax Insight (Co-I, 2017–2019, £240k), *"Advanced wind turbine prognostics using machine learning"*

TIC-Wind-03B (Co-I & Researcher, 2017–2018, £145k), *"Commercial Frequency Response from Wind."*

TIC-Wind-03, (Co-I & Researcher, 2016, £20k), *"Ancillary Services from Wind: Initial Survey of possible Technical and Economic Opportunities."*

EPSRC Doctoral Prize, (Prize Winner & Researcher, 2015–2017, £100k), *"Optimal Operation of Wind Power Plant Informed by Probabilistic Forecasts."*

Awards   *Second Place: EEM Wind Power Forecasting Competition 2020*

Runner-up: Fuellers Future Energy Conference Research Presentation Competition 2019

Runner-up: Offshore Renewable Energy Catapult Hackathon 2019

Winner of the EEM 2017 Wind Power Forecasting Competition

Finalist: Scottish Renewables Young Professionals Green Energy Awards, Academic Category, 2015.

Outstanding student paper award, PMAPS Conference, 2014.

(Travel)   *Glasgow Research Partnership in Engineering (PI, 2017, £4k): "Probabilistic Solar Power Forecasting."*

International Institute of Forecasters Travel Award Grant (2016, US$1k)

Glasgow Research Partnership in Engineering, (PI, 2016, £2k), "Production and Use of Probabilistic Wind Power Forecasts."

COST Action ES1002 WIRE: Scientific Mission, Visit to DTU/Prof Pierre Pinson (PI, 2013, £2k), "Spatio-temporal Aspects of Probabilistic Wind Power Forecasting."

Research Supervision and Management

I presently lead a group focused on Energy Forecasting, including management ad hoc research staff and supervision of three PhD students. These roles include supporting professional development, performance reviews, financial management and other forms of support.

PDRA   Ciaran Gilbert (2020–2021), Electricity demand forecasting
Thomas Alexander (2020–2021), Electricity price forecasting
Robert Graham (2020–2021), Meteorology, S2S hydropower forecasting
Susan Brush (2020, 3 months), GB ancillary services
Fulin Fan (2018, 5 months), Hydropower forecasting
David Murray (2017–2018, 5 months), Electricity demand forecasting
Euan MacMahon (2017–2018, 4 months), Ancillary services
Marcel Nedd (2017–2018, 9 months), Ancillary services
David Hamilton, (2017, 2 months), Consultancy

PhD   Gabriel Dantes (First Supervisor, 2022–...), *"Short-term forecast uncertainty in future low-carbon energy systems"* UofG/School Scholarship

Klimis Stylpnopoulos (First Supervisor, 2022–...), *"Multi-variate forecasting for wind power integration in electricity markets"* Industry Funded

Panthakan Boonsuriyatham, (First Supervisor, 2022–...), *"Forecasting local net-electricity demand at scale"* Thai Government Scholarship

Leo May (First Supervisor, 2018–...), *"Forecasting and Analytics for Offering Frequency Response from Wind,"* Wind & Marine Energy CDT

Rosemary Tawn (First Supervisor, 2018–2022), *"Predictive Analytics for Short-term Wind and Solar Power Forecasting,"* industry sponsored PhD with Natural Power and The DataLab

Ciaran Gilbert (First supervisor, 2016–2020), *"Topics in High Dimensional Energy Forecasting,"* Wind & Marine Energy CDT

Joanna Sobon (Second Supervisor, 2019–2021), *"Operation of Energy Storage in Micro-grids"*

Alice Malvaldi (Mentor, 2014–2017), *"Spatio-Temporal Prediction of Wind Based on Wind Velocity and Related Parameters,"* Wind Energy Systems CDT

MSc   Kevin Kawal (2020), *"Change point detection for modelling and predicting electricity demand"*

Krishnadas Valsan (2020), *"Multi-region Solar Power Forecasting"*

Pablo Benavides López (Visiting Strathclyde from Technical University of Denmark, 2018), *"Probabilistic Electricity Price Forecasting"*

MRes   Leo May (Wind & Marine CDT, 2018), *"Very short-term power forecasting at Horns Rev 1"* with Vattenfall

Ahmed El-Bozie (Wind & Marine CDT, 2017), *"Probabilistic Forecasting of Maximum Wave Height"*

Patrick McGuckin (Future Power Networks CDT, 2017), *"Solar Power Forecasting and Operation of Combined Solar and Battery,"* with British Solar Renewables

Sofia Koukoura (Wind & Marine CDT, 2016), *"Hierarchical Wind Power Forecasting"*

Ciaran Gilbert (Wind & Marine CDT, 2016), *"Price Forecasting for Participation in Electricity Markets,"* with RES Ltd

Owain Roberts (Wind & Marine CDT, 2015), *"Evaluation of the benefits for a utility to improve wind power forecast skill for market participation,"* with EDF Energy

Alice Malvaldi (Wind Energy Systems CDT, 2014), *"Wind Prediction Enhancement by Supplementing Measurements with Numerical Weather Prediction Now-Casts"*

Hamish Macdonald (Wind Energy Systems CDT, 2013), *"Wind Prediction Enhancement by Environmental Parameters"*

Viva   ***External Examiner***: Kevin Bellinguer, MINES ParisTech/PSL, 2022: *"Optimisation of the Use of Multiple Sources of Data in Short-term Photovoltaic Generation Forecasting Models"*

Carla Gonçalves, University of Porto, 2021: *"Renewable Energy Forecasting: Extreme Quantiles, Data Privacy and Monetization"*

M Groch, Stellenbosch University, 2019: *"Modelling and Short-Term Forecasting of High Wind Speed Events at Operational Wind Farms"*

Internal Examiner: Yoana Napier, University of Glasgow, 2022: *"High resolution air quality modelling and prediction"*

Convenor: Haijie Qi, University of Strathclyde, 2020: *"Optimal operation and sizing of a combined heat and power system integrated with demand side response in a smart energy hub"*

Teaching

2022–	*Lecturer, "2X: Probability II"*
2021–	*Lecturer, "Time Series" (STATS4037 & 5030)*
2021–	*Coordinator: MSci in Statistics with Work Placement*
2021–	*Projects in Statistics; BSc, MSci & MSc*
2016–2020	*"Wind Waves and Tides in ORE", Centre for Doctoral Training Core Module*
2018	*EES-UETP (summer school): Statistical Learning for Uncertainty Forecasting*
2017–	*Data Science for Environmental Modelling and Renewables—MOOC*

2015–2021 *Guest lecturer, tutor, and project supervision, Electronic & Electrical Engineering; BEng, MEng & MSc*

2012–2015 *Educational Outreach: Glasgow Schools, Science Centre and Science Festival*

Knowledge Exchange Activity

Consulting Regular consultancy with UK and European utilities and government on forecast improvement, evaluation and participation in European electricity markets.
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Partners *National Grid Electricity System Operator*
I am in regular contact with staff at NGESO, including members of the Forecasting Team and control room staff. I have consulted with them on aspects of forecasting methodology, use of forecasts in operational settings, and statistical analysis of energy data in general. NGESO have funded my work directly as a consultant and via the Network Innovation Allowance. In 2022 I delivered a training course on probabilistic forecasting to NGESO staff, and am seconded into the forecasting team on a part time basis from 2023-24.

SSE and Scottish Power, Large Utilities, Europe
I regularly interact with the renewables and trading teams at SSE and SP who have supported my research with in-kind data provision, co-funding research projects, and via network innovation schemes (NIA and SIF). Both organisations have deployed forecasting systems I have developed.

Professional Membership

IEEE Senior Member, member of the Power and Energy Society and Working Group on Energy Forecasting and Analytics (Vice-chair 2021–22, Chair 2022–present), session organiser and invited panellist at PES General Meetings.

RSS Fellow of the Royal Statistical Society, 2017–present.

HEA Fellow of the Higher Education Academy, 2017–present.

IIF Member of the International Institute of Forecasters and Secretary of the UK Chapter, 2019–present, and regular organiser of sessions at the ISF conference.

WEMC Member of the World Energy Meteorology Council, 2019–present.

IEA WP co-lead of International Energy Agency Wind task 36 and active member PVPS task 16

ONS Office for National Statistics Accredited Researcher number 34064.