Professor BETHAN OWEN

Department of Natural Sciences,
Manchester Metropolitan University, M1 5GD
Tel: 0161 2471591 and 07920 083914
Email: b.owen@mmu.ac.uk

EDUCATION

2007-2010	PhD Aviation Technology Targets and Climate Change, **Manchester Metropolitan University**
1988 to 1989	MSc Pollution and Environmental Control, **University of Manchester**
1985 to 1988	BSc (Hons) Chemistry 2:1 **University of Sheffield**

EMPLOYMENT HISTORY

July 2018 to date
Professor and Reader – Dept of Natural Sciences, Manchester Met University

Research interests include emissions from aviation; future scenarios, future technologies and fuels; and atmospheric impacts, both local and global. Strengths include translation of science and technical research to policy relevant applications and implementation.

- Principal and Co-investigator on several large research and knowledge exchange projects in the field of aviation and environment.
- Providing technical and scientific data and information on atmospheric impacts of aviation to UK government and European States/Commission.
- Rapporteur (chair) of the Emissions and Technical Working Group (WG3) at the United Nations specialised agency ICAO (International Civil Aviation Organisation) CAEP.

2009 to 2018
Research Fellow – Manchester Met University

- Project Management of UK Department for Transport research project.
- Leading numerous work packages in large European framework funded projects.
- Undertaking numerous research projects at the national and European level.
- Teaching on undergraduate Environmental Science and MSc on Aviation and Environmental Practice. Project supervision for UG and PG.

1997 to 2009
Research Associate – Manchester Met University

- Research on dispersion modelling for predicting local air quality impacts and developing regional emission inventories and dispersion modelling studies.
- Deputy Director of ARIC Atmospheric Research and Information Centre (predecessor of CATE and the Aviation and Environment group), establishing sustained funding from a variety of sources: local government, UK airports and Highways Agency.
- Undertaking PhD.

1990- 1996
Environmental Consultancy – CES Ltd/Maunsell

Producing environmental impact statements for projects including motorways, large wastewater treatment plants, industrial processes. Measurement and survey work on local air quality, water quality and noise.

JOURNAL PUBLICATIONS

Lee, D., Allen, M. R., Cumpsty, N., Owen, B., Shine, K. P., & Skowron, A. (2023). Uncertainties in mitigating aviation non-CO2 emissions for climate and air quality using hydrocarbon fuels. *Environmental Science: Atmospheres*. doi:10.1039/d3ea00091e

Owen, B., Anet, J. G., Bertier, N., Christie, S., Cremaschi, M., Dellaert, S., . . . Terrenoire, E. (2022). Review: particulate matter emissions from aircraft. *Atmosphere*, *13*(8), 1230. doi:10.3390/atmos13081230

Matthes, S., Lee, D. S., De Leon, R. R., Lim, L., Owen, B., Skowron, A., . . . Terrenoire, E. (2022). Review: The Effects of Supersonic Aviation on Ozone and Climate. *Aerospace*, *9*(1), 41. doi:10.3390/aerospace9010041

Matthes, S., Lim, L., Burkhardt, U., Dahlmann, K., Dietmüller, S., Grewe, V., . . . Skowron, A. (2021). Mitigation of Non-CO2 Aviation's Climate Impact by Changing Cruise Altitudes. *Aerospace*, *8*(2), 36. doi:10.3390/aerospace8020036

Skowron, A., Lee, D. S., Rodriguez De Leon, R., Lim, L., & Owen, B. (2021). Greater fuel efficiency is potentially preferable to reducing NOx emissions for aviation's climate impacts. *Nature Communications*, *12*(564). doi:10.1038/s41467-020-20771-3

Lee, D. S., Fahey, D. W., Skowron, A., Allen, M. R., Burkhardt, U., Chen, Q., . . . Wilcox, L. J. (2021). The contribution of global aviation to anthropogenic climate forcing for 2000 to 2018. *Atmospheric Environment*, *244*(117834). doi:10.1016/j.atmosenv.2020.117834

Agarwal, A., Speth, R. L., Fritz, T. M., Jacob, S. D., Rindlisbacher, T., Iovinelli, R., . . . Barrett, S. R. H. (2019). SCOPE11 Method for Estimating Aircraft Black Carbon Mass and Particle Number Emissions.. *Environmental Science and Technology (Washington)*, *53*(3), 1364-1373. doi:10.1021/acs.est.8b04060

Matthes, S., Grewe, V., Dahlmann, K., Frömming, C., Irvine, E., Lim, L., . . . Yin, F. (2017). A Concept for Multi-Criteria Environmental Assessment of Aircraft Trajectories. *Aerospace*, *4*(3). doi:10.3390/aerospace4030042

Søvde, O. A., Matthes, S., Skowron, A., Iachetti, D., Lim, L., Owen, B., . . . Isaksen, I. S. A. (2014). Aircraft emission mitigation by changing route altitude: A multi-model estimate of aircraft NO<inf>x</inf> emission impact on O<inf>3</inf> photochemistry. *Atmospheric Environment*, *95*, 468-479. doi:10.1016/j.atmosenv.2014.06.049

Olsen, S. C., Wuebbles, D. J., & Owen, B. (2013). Comparison of global 3-D aviation emissions datasets. *Atmospheric Chemistry and Physics*, *13*(1), 429-441. doi:10.5194/acp-13-429-2013

Lamarque, J. F., Bond, T. C., Eyring, V., Granier, C., Heil, A., Klimont, Z., . . . Van Vuuren, D. P. (2010). Historical (1850-2000) gridded anthropogenic and biomass burning emissions of reactive gases and aerosols: Methodology and application. *Atmospheric Chemistry and Physics*, *10*(15), 7017-7039. doi:10.5194/acp-10-7017-2010

Owen, B., Lee, D. S., & Lim, L. (2010). Flying into the future: aviation emissions scenarios to 2050.. *Environ Sci Technol*, *44*(7), 2255-2260. doi:10.1021/es902530z

Lee, D. S., Fahey, D. W., Forster, P. M., Newton, P. J., Wit, R. C. N., Lim, L. L., . . . Sausen, R. (2009). Aviation and global climate change in the 21st century. *Atmospheric Environment*, *43*(22-23), 3520-3537. doi:10.1016/j.atmosenv.2009.04.024

Fleming, G., Malwitz, A., Balasubramanian, S., Roof, C., Grandi, F., Kim, B., . . . Owen, B. (2008). Trends in global noise and emissions from commercial aviation for 2000 through 2025. *ICAS Secretariat - 26th Congress of International Council of the Aeronautical Sciences 2008, ICAS 2008*, *3*, 2286-2294.

Peace, H., Maughan, J., Owen, B., & Raper, D. (2006). Identifying the contribution of different airport related sources to local urban air quality.. *Environ. Model. Softw.*, *21*, 532-538. doi:10.1016/j.envsoft.2004.07.014

Owen, B. (2005). Air quality impacts of speed-restriction zones for road traffic.. *Sci Total Environ*, *340*(1-3), 13-22. doi:10.1016/j.scitotenv.2004.08.011

Peace, H., Owen, B., & Raper, D. W. (2004). Identifying the contribution of different urban highway air pollution sources.. *Sci Total Environ*, *334-335*, 347-357. doi:10.1016/j.scitotenv.2004.04.057

Peace, H., Owen, B., & Raper, D. W. (2004). Comparison of road traffic emission factors and testing by comparison of modelled and measured ambient air quality data.. *Sci Total Environ*, *334-335*, 385-395. doi:10.1016/j.scitotenv.2004.04.058

Owen, B., Edmunds, H. A., Carruthers, D. J., & Raper, D. W. (1999). Use of a new generation urban scale dispersion model to estimate the concentration of oxides of nitrogen and sulphur dioxide in a

large urban area. *SCIENCE OF THE TOTAL ENVIRONMENT*, *235*(1-3), 277-291. doi:10.1016/S0048-9697(99)00205-3

Rayfield, D., Longhurst, J. W. S., Watson, A. F. R., Hewison, T., Raper, D. W., Conlan, D. E., & Owen, B. (1998). A methodology for estimation of vehicle emissions in an urban environment: An example from Greater Manchester. *Environmentalist*, *18*(3), 175-182. doi:10.1023/A:1006602217842

Research Outputs – statistics from SCOPUS

Journal publications (27 outputs):

- Field-weighted citation index of 5.16.
- 82% of the publications are in top citation percentiles.
- 82% of the publications are in collaboration with international authors.
- 46% of the publications are in the top 25% journals.
- Total citations 3440

Some current and recently completed research projects

Aviation Atmospheric Environmental Technical Support (to date) UK Department for Transport

ACACIA (complete to Feb 2024) https://www.acacia-project.eu Advancing the Science for Aviation and Climate. This Project is funded by the EU H2020 Research and Innovation Action.

AVIATOR (complete to June 2023) Assessing aViation emission Impact on local Air quality at airports: TOwards Regulation https://aviatorproject.eu This Project is funded by the EU H2020 Research and Innovation Action.

HOPE (to date) https://hope-eu-project.eu This project has received funding from the Horizon Europe research and innovation programme and is co-funded by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee.

PULSAR (to date) Propelling eUropean Leadership through Synergising Aviation Research https://www.pulsar-project.eu This project has received funding from the Horizon Europe research and innovation programme and is co-funded by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee

RAPTOR (complete to 2022) Research of Aviation PM Technologies, mOdelling and Regulation funded by Clean Sky 2 Joint Undertaking under the European Union's Horizon 2020 research program https://aviation-pm.eu

SENECA (to date) https://seneca-project.eu noiSe and EmissioNs of supErsoniC Aircraft. This Project is funded by the EU H2020 Research and Innovation Action

Past Research Projects

UK Department for Transport **Aviation Atmospheric Environmental Technical Support**
(2010 to 2020 Project Manager since 2010.

FORUMAE (2013 to 2017) PI and WP leader, **FORUM on Aviation and Emissions.** European Framework Project.

QUANTIFY (2005 to 2010) as a Work Package Leader, **Quantifying the Climate Impact of Global and European Transport Systems** EU Framework project.

REACT4C (2010 to 2014) **Reducing emissions from aviation by changing trajectories for the benefit of climate** EU Framework project.

TEAM_PLAY (2010 to 2013) as a Work Package lead **Tool Suite for Environmental and Economic Aviation Modelling for Policy Analysis** EU Framework project.

UK Department of Transport (2011) **Developing Marginal Abatement Cost Curves for Aviation.**