Constance Crozier

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Education

D.Phil **University of Oxford**, Engineering Science — Oct 2016 – July 2020
- Thesis: Impact of Domestic Electric Vehicles on Electricity Networks
- Advisor: Malcolm McCulloch

M.Eng **University of Oxford**, Engineering Science — Oct 2012 – July 2016
- Thesis: Bayesian Non-Parametrics for the War in Afghanistan
- Advisor: Michael Osborne

Experience

Georgia Institute of Technology, H. Milton School of Industrial & Systems Engineering — Atlanta, GA
Assistant Professor — Aug 2023 – present

University of Colorado Boulder, Civil, Environmental, and Architectural Engineering — Boulder, CO
Postdoctoral Associate (Advisor: Kyri Baker) — Sep 2020 – July 2023

UK Department for Business, Energy & Industrial Strategy — London, UK
Technical Energy Advisor — Oct 2019 – August 2020

Publications

Published peer reviewed journal articles

[J16] M. Mohammadian, C. Crozier, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging with delivery fleets, *Applied Energy*, 2024.

[J15] C. Crozier, M. Neaimeh, M. Deakin, Learning by charging: Understanding consumers' changing attitudes towards vehicle-to-grid, *Applied Energy*, 2024.

[J14] C. Crozier, A. Pigott, K. Baker, Price perturbations for privacy preserving demand response with distribution network awareness, *IEEE Transactions on Smart Grid*, 2024.

[J13] C. Crozier, K. Baker, The effect of renewable electricity generation on the value of cross-border interconnection, *Applied Energy*, 2022.

[J12] A. Pigott, C. Crozier, K. Baker, Z. Nagy, GridLearn: multiagent reinforcement learning for grid-aware building energy management, *Electric Power Systems Research*, 2022.

[J11] C. Crozier, K. Baker, B. Toomey, Feasible region-based heuristics for optimal transmission switching, *Sustainable Energy, Grids and Networks*, 2022.

[J10] C. Crozier, C. Quarton, N. Mansor, D. Pagnano, I. Llewellyn, Modeling of the ability of a mixed renewable generation electricity system with storage to meet consumer demand, *Electricity*, 2022.

[J9] K. Collett, S. Hirmer, H. Dalkmann, C. Crozier, Y. Mulugetta, M. McCulloch, Can electric vehicles be good for Sub-Saharan Africa?, *Energy Strategy Review*, 2021.

[J8] C. Crozier, T. Morstyn, M. McCulloch, Capturing diversity in electric vehicle charging behaviour for network capacity estimation, *Transportation Research Part D: Transport and Environment*, 2021.

[J7] C. Crozier, T. Morstyn, M. McCulloch, The opportunity for smart charging to mitigate the impact of EVs on the GB transmission and distribution systems, *Applied Energy*, 2020.

[J6] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, Co-ordinated electric vehicle charging to reduce losses without network impedance information, *IET Smart Grid*, 2020.

[J5] T. Morstyn, C. Crozier, M. Deakin, M. McCulloch, Electric vehicle smart charging with battery voltage awareness using second-order cone programming, *IEEE Transactions on Transport Electrification*, 2020.

[J4] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, The case for bi-directional charging of electric vehicles in low voltage distribution networks, *Applied Energy*, 2020.

[J3] K. Collett, M. Byamukama, C. Crozier, M. McCulloch, Energy and transport in Africa and South Asia, *Energy and Economic Growth*, 2020.

[J2] C. Crozier, D. Apostolopoulou, M. McCulloch, Mitigating the impact of personal vehicle electrification: A power generation perspective, *Energy Policy*, 2018.

[J1] J. Cao, C. Crozier, M. McCulloch, Optimal design and operation of a low carbon community based multi-energy systems considering EV integration, *IEEE Transactions on Sustainable Energy*, 2018.

Peer reviewed conference proceedings

[C17] C. Ju, C. Crozier, Learning a local trading strategy: Deep reinforcement learning for grid-scale renewable energy integration, *Hawaii International Conference on System Sciences*, 2025.

[C16] R. Davila-Severiano, C. Crozier, Scheduling electrified freight transportation to increase renewable generation utilization, *IEEE North American Power Systems Conference*, 2024.

[C15] E. Marchesini, B. Donnot, C. Crozier, I. Dytham, C. Merz, L. Schewe, N. Westerbeck, C. Wu, A. Marot, P. Donti, RL2Grid: Benchmarking reinforcement learning in power grid operations, Submitted: *International Conference on Machine Learning*

[C14] H. Sharadga, J. Mohammadi, C. Crozier, K. Baker, Optimizing Multi-Timestep Security-constrained optimal power flow for large power grids, *IEEE Texas and Power Engineering Conference*, 2024.

[C13] Priyadarshan, E. Pergantis, C. Crozier, K. Baker, K. Kircher, EDGIE: A simulation test-bed for investigating the impacts of building and vehicle electrification on distribution grids, *Hawaii International Conference on System Sciences*, 2024.

[C12] S. Curtis, J. Montagu, C. Crozier, C. Torres-Machi, K. Baker, Trends in equitable electric vehicle adoption and impacts on pavement quality and electric power reliability, *ASCE*, 2024.

[C11] C. Winner, J. Garland, C. Crozier, K. Baker, Carbon emissions resulting from different power flow models for dispatch, *IEEE PES General Meeting*, 2023.

[C10] C. Crozier, K. Baker, Data-driven probabilistic constraint elimination for accelerated optimal power flow, *IEEE PES General Meeting*, 2022.

[C9] C. Crozier, A. Pigott, K. Baker, Spatial arbitrage through bidirectional electric vehicle charging, *IEEE PES General Meeting*, 2022.

[C8] M. Li, Y. Du, J. Mohammadi, C. Crozier, K. Baker, Numerical comparisons of linear power flow approximations: optimality, feasibility, and computation time, *IEEE PES General Meeting*, 2022.

[C7] C. Crozier, K. Baker, Y. Du, M. Li, J. Mohammadi, Data driven methods for contingency filtering in security constrained optimal power flow, *International Conference on Probabilistic Methods Applied to Power Systems*, 2022.

[C6] C. Crozier, K. Baker, Optimal sizing of an energy storage portfolio considering multiple time-scales, *IEEE PES General Meeting*, 2021.

[C5] M. Deakin, C. Crozier, T. Morstyn, D. Apostolopoulou, M. McCulloch, Stochastic hosting capacity in distribution networks, *IEEE PES General Meeting*, 2019.

[C4] C. Crozier, M. Deakin, T. Morstyn, M. McCulloch, Incorporating charger efficiency into electric vehicle charging optimization, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2019.

[C3] L. Han, T. Morstyn, C. Crozier, M. McCulloch, Improving the scalability of a prosumer cooperative game with k-means clustering, *IEEE PowerTech*, 2019.

[C2] C. Crozier, D. Apostolopoulou, M. McCulloch, Clustering of usage profiles for electric vehicle behaviour analysis, *Innovation in Smart Grid Technologies (ISGT) Europe*, 2018.

[C1] C. Crozier, D. Apostolopoulou, M. McCulloch, Numerical analysis of national travel data to assess the impact of UK fleet electrification, *Power Systems Computation Conference*, 2018.

Teaching

- **ISyE 4501 Energy, Efficiency and Sustainability**, Undergraduate class with 19–38 students
  Spring 2025, Spring 2024
- **ISyE 6669 Deterministic Optimization**, Graduate class with 24–55 students.
  Spring 2025, Fall 2023

Grants and Contracts

As Principal Investigator

2. Title of Project: Quantifying benefits of behind-the-meter solar power for various customers
   Agency/Company: Great Plains Institute
   Total Dollar Amount: $30,000
   Candidate's Share: 100%
   Collaborators: Valerie Thomas (Co-PI)
   Period of Contract: 1/2025 – 7/2025

1. Title of Project: Mitigating the risk of life threatening power outages during extreme weather
   Agency/Company: Brook Byers Institute for Sustainable Systems
   Total Dollar Amount: $17,500
   Candidate's Share: 100%
   Collaborators: Brian An (Co-PI)
   Period of Contract: 8/2024 – 7/2025

As Co-Principal Investigator

1. Title of Project: Fast and robust strategies for large-scale mixed-integer SCOPF
   Agency/Company: ARPA-E
   Total Dollar Amount: $400,000
   Collaborators: Javad Mohammadi (PI), Kyri Baker (Co-PI)
   Period of Contract: 6/2022 – 10/2024

Graduate Students

Current PhD Students

- **Rina Davila Severiano**, Fall 2023 – pres
  Thesis topic: Demand flexibility from electrified supply chains
  Milestones: Passed qualifying exam (Oct 2024)
- **Xiangxin An**, Fall 2024 – pres
  Thesis topic: Integer decisions in power system operation
  Co-advisor: Santanu Dey

Service

Associate Editor, IEEE Transactions on Energy Markets, Policy & Regulation — Dec 2023 – present

Task Force Chair, IEEE SBSC Task Force on Electric Vehicle Integration — Aug 2023 – Jul 2025

Organizing Committee, Los Alamos Grid Science Winter School — Jul 2024 – Jan 2025

Invited Talks

Decision tools for more flexible electric power grids

NC State University, Department of Industrial and Systems Engineering — Oct 2024

Power sector decarbonization with human-in-the-loop

Stanford University, Department of Mechanical Engineering — Aug 2023
Newcastle University, Department of Electrical Engineering — Jun 2023
UC Davis, Department of Electrical and Computer Engineering — Mar 2023
Duke University, Department of Civil and Environmental Engineering — Mar 2023
Cornell, Department of Civil and Environmental Engineering — Mar 2023
Cornell Tech, Department of Electrical and Computer Engineering — Mar 2023
Carnegie Mellon University, Department of Electrical and Computer Engineering — Feb 2023
Georgia Tech, Department of Industrial and Systems Engineering — Feb 2023
Rice University, Department of Civil and Environmental Engineering — Jan 2023
Texas A&M, Department of Electrical and Computer Engineering — Dec 2022

Large scale low carbon electricity networks with human-in-the-loop

Imperial College London, Department of Electrical and Electronic Engineering — Mar 2022
Boston University, Department of Electrical and Computer Engineering — Mar 2022
MIT, Department of Mechanical Engineering — Feb 2022
Temple University, Department of Electrical and Computer Engineering — Feb 2022