

# Cormac O'Malley

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## EDUCATION

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### **PhD, Efficient and Secure Operation of Low Carbon Power Systems** **Aug 2019 – Jan 2023**

*Imperial College London, Dept of Electrical and Information Engineering*

- Designing and implementing novel methods (convex optimisation, ML/RL) to solve decarbonization challenges. Supervised by Prof Goran Strbac, Dr Fei Teng & Dr Luis Badesa.
- Extensive model development work in Python (and to a lesser extent C++), with collaborative code development (git, conda).
- Experienced Python programmer (Jupyter, Pandas, matplotlib, scipy.stats), using optimisation (PYOMO, Gurobi, MOSEK) and more recently ML/RL (fastAI, PyTorch (limited)) techniques and libraries to solve problems relating to the energy transition.
- First author of 1 reinforcement learning journal paper (github, PYTHON), developing fundamentally novel methods to efficiently schedule power plants in low carbon system.
- Achieved first author publication of two journal papers on optimisation published in IEEE Trans on Power Systems, a top journal with an acceptance rate of less than 15%.
- Additional 1 journal and 1 conference paper on optimisation. Requires proof via simulation, then communication of findings (LaTeX) convincingly to expert reviewers and audience.
- Delivered research to schedule and presented findings to funders on various large research projects: Innovate UK funded (£4mil) project E4Future; EPSRC funded (£7mil) project IDLES; and PhD funding body National Grid ESO.

### **MENG, Engineering Science: First Class (72.3%)**

**2014-2018**

*University of Oxford, Pembroke College*

- 77% in final year research project.
- Achieved the top mark in the year for all power system modules.
- Academic Scholar and Paul Martins BP Engineering Scholarship, both awarded for academic achievement.

## EXPERIENCE

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### **Energy Engineer**

**Feb-May 2022**

*Ministry for Business Energy and Industrial Strategy (BEIS)*

- Planned and produced business case (approved by treasury) to justify spending £3.75m to set up a UK centre for AI in energy.
- Significantly upgraded an internal model (Python – PYOMO, git), enabling the co-optimisation of renewable generation capacity, storage assets and EV charger types under different weather and demand scenarios. It is still actively being used by BEIS to inform policy decisions.
- Carried out research on the marginal value of bidirectional electric vehicle chargers over unidirectional, presented conclusions to over 40 senior civil servants

### **Postgraduate Teaching Assistant**

**2020-2022**

*Imperial College London*

- Devised, supervised, and assessed a 1-year masters student project. Research was a success and resulted in a full journal paper (currently under peer review).

- Assessed and marked five master student theses.

## OTHER RELEVANT EXPERIENCE

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### Founder and Host of the Podcast: Low Carbon Conversations

2021

*Imperial College's Energy Futures Lab*

- Produced and launched podcast focussed on discussing the technical solutions to overcome UK decarbonisation challenges. Available on [Spotify](#) and [Apple Podcasts](#).
- Accomplished average listenership of over 1,500 people per podcast.
- Demonstrates ability to explain complicated energy transition topics in simple engaging words.
- Organization and networking ability to find expert guests, graphic designer, and sound producer.

## PUBLICATIONS

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**O'Malley, C.**, de Mars, P., Badesa, L., & Strbac, G. (2022). Reinforcement Learning and Mixed Integer Programming for Scheduling Power Plants in Low Carbon Systems: Comparison and Hybridisation. *Under Review*, Applied Energy, available [here](#).

**O'Malley, C.**, Badesa, L., Teng, F., & Strbac, G. (2022). Frequency Response from Aggregated V2G Chargers With Uncertain EV Connections. IEEE Transactions on Power Systems, available [here](#).

**O'Malley, C.**, Badesa, L., Parajeles, M., & Strbac, G. (2022). Chance-constrained allocation of UFLS candidate feeders under high penetration of distributed generation. International Journal of Electrical Power & Energy Systems (IJEPE), available [here](#).

**O'Malley, C.**, Badesa, L., Teng, F., & Strbac, G. (2021). Probabilistic Scheduling of UFLS to Secure Credible Contingencies in Low Inertia Systems. IEEE Transactions on Power Systems, available [here](#).

Imperial College London, Nissan Motor GB, E.ON Drive, (2021). The Drive Towards a Low-Carbon Grid: Unlocking the Value of Vehicle-to-Grid Fleets in Britain. White Paper, available [here](#).

**O'Malley, C.**, Aunedi, M., Teng, F., & Strbac, G. (2020). Value of Fleet Vehicle to Grid in Providing Transmission System Operator Services. IEEE EVER Conference, available [here](#).