

Fully Funded PhD Scholarship in Photovoltaic (PV) Microgrids for Electricity Access in Africa

Overview: A PhD place is offered, full-time for three years, at Imperial College as part of a collaborative project ('SOMSE') with the University of Paris-Saclay, Centrale Supélec, CNRS, Paris, France addressing the improved utilisation of electricity from photovoltaic (PV) microgrids. Candidates should have UK home-fees status and be available to start in **Autumn/Winter 2026**.

Context & objective of the project: Over 500 million people in sub-Saharan Africa (SSA) still lack access to electricity. Thanks to rapid reductions in costs, standalone solar-PV microgrids have become a promising low-carbon solution for rural electrification. However, their economic viability remains limited as they rely on costly battery storage to match solar power generation with demand. Expanding PV microgrids to supply electricity for wider community services (e.g., water, health, transport) and productive uses (e.g., milling and agriculture, small-scale artisanal activities) introduces loads that can be better aligned with solar generation or which can utilise demand-side response strategies (load shifting).

PhD short description: This PhD aims to investigate how the selection and combination of community and productive electricity uses influences livelihoods and the affordability of access to sustainable energy. The successful candidate will develop computational models of electricity uses in rural microgrids, model a wide range of electricity-enabled services (e.g., water access, cold storage, agri-processing, electric-vehicle charging), capturing their temporal dynamics, flexibility potential, and socio-economic value. These models will be integrated into the open-source microgrid modelling framework, CLOVER, alongside appropriate socio-economic indicators quantifying impacts on livelihoods (e.g., income generation, access to essential services, health, communications). The work will involve model development, simulation and data analysis along with analysis of socio-economic metrics. A key challenge will be to design models that are both realistic and computationally efficient for large-scale simulations. The developed framework will then be applied to conduct geospatial analyses across SSA, using large-scale input datasets to identify how electricity-enabled services deliver the highest impact in different regional contexts.

The project will be supervised by Professor Jenny Nelson and Dr Chiara Candelise (Imperial) and Dr Simon Meunier (CentraleSupélec) with support from Dr Benedict Winchester (Imperial). The PhD student will work in close collaboration with a second PhD student, based at CentraleSupélec. Both PhD students will make research visits to each others' institutions benefit from collaborations with partners in UK and Africa and from research visits in Africa to engage with local partners.

Application timeline: Prospective candidates should email Prof Nelson (jenny.nelson@imperial.ac.uk) and Dr Meunier (simon.meunier@centralesupelec.fr), CC-ing Dr Benedict Winchester (b.winchester20@imperial.ac.uk), by midnight on **Sunday July 26th** with:

- their CV;
- a short (< 1 page) statement of interest;
- and a clear indication of their fee status.

Interviews are expected to be held in-person or online during the period 28th July – 7th August 2026. Candidates should indicate in their application whether they are available during this period.

Candidates from a wide range of backgrounds are encouraged to apply. A strong motivation to engage with energy systems and interdisciplinary research, and to develop skills beyond one's initial field of training, is, however, essential. The PhD will involve a significant computation element and so experience in coding or a willingness to learn is essential. The studentship covers full stipend at UKRI rates for three years and tuition fees for candidates with UK home-fee status only (please see [Imperial guidance](#) if you are unsure of your fee status); overseas tuition fees cannot be covered.

Any questions or informal enquirers should be addressed to both jenny.nelson@imperial.ac.uk and simon.meunier@centralesupelec.fr, CC-ing b.winchester20@imperial.ac.uk.