SSDL Sustainable Systems Design Laboratory

University of Victoria | Institute for Integrated Energy Systems

Graduate Student & Post-doc Positions: Energy Storage Valuation

Many low-carbon pathways to mitigate climate change require energy storage to bridge the gap between mismatched temporal and spatial characteristics of energy demand and supply. Emerging storage technologies, including 'virtual storage/generation' from demand response, also offer entirely new paradigms for operation of a low-carbon energy system. There are also potential synergies between liquid/gaseous fuels (including existing seasonal natural gas storage) and electricity energy carriers to span heating and cooling loads, direct electrical loads, and both stationary and mobile demands, providing dispatchable services from the millisecond to annual timescales and enhancing resiliency.

Multiple MASc, PhD and Post-doc positions are available in a research project led by Dr. Curran Crawford (who directs the Sustainable Systems Design Lab - ssdl.uvic.ca), together with other IESVic professors in Mechanical and Civil Engineering at the University of Victoria. The project will evaluate a whole range of storage modalities from lithium and flow batteries, through to power-to-gas and demand response, to access their value in grid- and off-grid applications to utilities and customers, in the unique hydroelectricity-dominated BC context. The project (and other associated projects) will require students and researchers for data analysis (machine learning/clustering of generation/load data), computational modeling (e.g. agent-based grid integration simulation) and experimental evaluation of lab- and demo-scale storage tasks (e.g. battery cell degradation testing). The project will also evaluate the resiliency benefits of embedding energy storage in the combined electricity-gas network system.

Requirements

- Master's or PhD degree in engineering
- Experience in some aspect of energy systems, in particular energy storage (batteries, power-to-gas, hydrogen, etc.) or resiliency analysis
- Familiarity with and enthusiasm for low-carbon energy systems analysis
- Knowledge of Python, LaTex, Matlab tools for analysis and figure generation
- Strong writing, conversational and presentation abilities in English
- Ability to work effectively in a diverse team

Timeline

Subject to funding, fall 2019 through to winter 2020.

How to apply

Interested candidates should email Dr. Crawford at curranc@uvic.ca with the subject Energy Storage Positions, and attach:

- ☑ A detailed curriculum vitae
- ☑ A one-page cover letter describing your relevant (research) experience and motivation for the position
- ☑ Names and contact details for two references

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