University of Victoria
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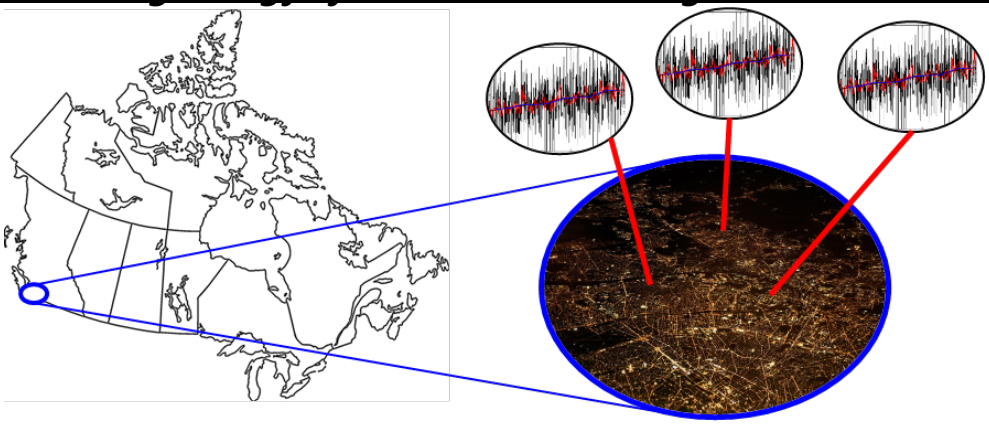
PhD position in

Modelling energy systems from building to national scale



Buildings, renewable energy generation and storage technologies and associated energy systems all pose complex, interacting design and operational challenges. Finding high-performing solutions to these problems requires computational tools that can simulate and optimize these systems across a range of spatial scales, spanning buildings and local renewables, district heating networks and micro-grids, and national electricity grids and large-scale renewables. This will answer broad questions regarding the allocation of resources between different scales, for example investing in building efficiency improvements, district systems or large-scale renewable energy generation.

The approach to be explored in this project is to link the 'energy hub' model and associated building data for district-scale optimizations with the OSeMOSYS model for larger-scale systems modelling. Later development may combine these models into a unified framework. This position will work to combine all of these areas via a unified cloud-based portal that will make modular software components available to other researchers as well as the general public.

The position will be supervised by Dr Ralph Evins (Imperial College London, ETH Zurich), who's Energy Systems and Sustainable Cities research group is pioneering the use of advanced computational techniques to deliver the low-energy buildings, cities and energy systems of the future. The co-supervisor will be Dr Andrew Rowe, who leads the 2060 project exploring grid integration issues in BC. The work will be carried out in the stimulating multi-disciplinary environment of the Institute for Integrated Energy Systems (IESVic) at the University of Victoria in beautiful British Columbia.

Research objectives

The core tasks of this project include:

- Development of a framework for multi-scale energy systems simulation and optimization.
- Evaluating and improving the framework for the purpose of tackling challenges related to multi-scale energy systems.
- Application of the framework to case studies with partners from academia and industry.

Requirements

- A Master's degree (MASc or MEng) in engineering, computer science, mathematics or physics is required. For an exceptional candidate without a Master's, entry into the MASc program could be possible instead.
- A good working knowledge of Python is required. For an exceptional candidate, an expert level in another programming language could be acceptable instead.
- Familiarity with energy systems modelling is desirable.
- Mastering the English language is required.

The University of Victoria is an equity employer and encourages applications from persons with disabilities, visible minorities, Aboriginal Peoples, people of all sexual orientations and genders, and others who may contribute to the further diversification of the University.

Timeline

Start date: ideally September 2018 (specify in your cover letter when you are available).
Duration: 3 years.

Funding

This position is funded at a level commensurate with NSERC scholarships.
Holders of such fellowships will be eligible for top-up funding.

How to apply

Interested candidates should email iesvic.admin@uvic.ca with the subject Evins PhD ES, attaching the following items:

- a detailed curriculum vitae
- a 1 page cover letter explaining your fit for the position and describing programming expertise and previous research experience
- names and contact information of at least two professional references.

Review of applications will begin in mid-June, though later submissions may be considered.
Do not apply for more than one position; indicate interest in other positions in your cover letter.