

Start date: ASAP
Duration: 13-16 weeks
Location: Victoria, BC
Compensation: \$2997.47 per month

Project Background

This project will involve an analysis of the benefits and feasibility of using the Component Modeling Approach Software Tool (CMAST) developed by the National Fenestration Rating Council (NFRC) as a tool to verify compliance with British Columbia's windows standards.

The built environment represents approximately 11% of greenhouse gas (GHG) emissions in British Columbia. In a typical home, windows account for 10-20% of the total building envelope area while being responsible for 30-60% of the building's heat loss.

Architectural trends have prompted commercial buildings to be designed with higher window to wall ratios (WWR) than in the past, which penalizes the energy performance of its building envelope. Windows are typically assembled on site from their individual components, including the frame, spacer, and glazing (glass). In 2011, the B.C. Government introduced energy performance standards for window systems in the Energy Efficiency Standards Regulation (EESR) in order to mitigate adverse energy impacts of this particular design trend. Reports from compliance officers, glazing contractors, consultants, and manufacturers alike suggest that there is a significant degree of non-compliance with this particular standard as a result of the inability of contractors to verify the energy performance of window systems prior to installation.

A tool developed by the National Fenestration Rating Council (NFRC) called the Component Modeling Approach Software Tool (CMAST) is a potential solution to this growing issue. The tool makes use of a database that is populated with energy performance values for individual glazing, spacer, and frame assemblies. Glazing contractors can use CMAST to verify energy performance a priori, without having to make judgment calls in the field with respect to installed window energy compliance.

More information on CMAST is available here: <http://nfr.org/CMA/CMA-tools.aspx>

The Ministry of Energy and Mines (MEM) is interested in assessing the benefits and feasibility of retaining CMAST to verify compliance with British Columbia's windows standards. The project will include a detailed technical analysis of the tool to assess its strengths and limitations, including modeling commonly used fenestration systems to verify accuracy, along with a stakeholder survey and workshop to glean perspectives from industry regarding costs and ease of administrative and technical implementation.

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A report and presentation will be prepared that outlines the major findings of the work term, including an economic analysis from a consumer, industry, and provincial perspective, while also highlighting recommendations for future work.

Required Qualifications/Competencies:

- Enrolled as a full-time undergraduate engineering student from a PICS-affiliated university
- Demonstrated experience in computer programming, modeling software and/or data analysis/manipulation
- Proficient with the Microsoft suite of products, especially Word, Excel, and PowerPoint
- Ability to work with a team of multi-disciplinary staff
- Strong communication and presentation skills

Recommended:

- Knowledge of basic heat transfer theory
- Basic understanding of residential and/or commercial fenestration systems
- Demonstrated interest in building science and/or building energy modeling
- Membership in a local ASHRAE chapter
- Familiarity with ASHRAE building energy efficiency standards, (ASHRAE 90.1 and 189.1)
- Registered with APEGBC - MAPS (or ability to register)