CALL FOR APPLICATIONS

Master's internship - What vehicle electrification strategy in Quebec to accelerate decarbonization? Focus on municipal fleets

Context

The electrification of vehicle fleets is a major lever in Quebec's decarbonization plan. Indeed, transportation accounts for 45% of the province's emissions in terms of direct energy consumption alone. This high contribution is mainly due to the mobility sector's heavy dependence on fossil fuels. Yet Quebec has one of the lowest carbon electricity consumption rates in the world. Thanks to this territorial advantage, the CIRAIG has estimated that driving an electric car rather than a combustion-powered car in Quebec reduces carbon emissions by 65%, taking into account the full life-cycle impacts. Electromobility could therefore be a powerful lever for achieving the shared goal of carbon neutrality by 2050. However, this transition from fossil-fuelled to electric mobility faces a number of limitations, not least financing and the sharing of critical metal resources required for the climate transition. Today, the government is encouraging this transition by directing most of its subsidies towards the acquisition of electric vehicles by households. However, organizational fleets, such as those of companies and municipalities, can be much more intensive in their annual use: prioritizing their electrification could greatly accelerate the reduction of greenhouse gas (GHG) emissions, and thus the achievement of Quebec's short-term decarbonization targets by 2030. Nevertheless, these organizations and funding agencies lack quantitative decision-support tools to show the impact of earmarking electrification budgets on Quebec's decarbonization trajectory. What's more, municipalities often have large fleets of vehicles of various types, some with atypical and poorly understood environmental profiles.

Objective

The aim of this project is to address the blind spot in transport decarbonization represented by municipal vehicle fleets. The project team - made up of several CIRAIG members - is currently developing a decision-support tool to prioritize electrification investments in municipal fleets in order to optimize their life-cycle environmental impact. Using this tool, the aim is to estimate the decarbonization potential of Quebec municipalities via the electrification of their fleets, in order to produce larger-scale recommendations for prioritizing electrification subsidies between households, municipalities and other organizations, in order to follow the fastest decarbonization trajectory in Quebec.

Approach & tasks

The intern will join the project team as a research assistant.

1. It will assist in the development of the life cycle inventory database required for the life cycle environmental assessment of commercial vehicles used by cities in Quebec today and potentially in the future.

2. It will help develop data on the North American market for life-cycle cost inventories of these same vehicles.

3. It will evaluate the potential for decarbonizing Québec through the electrification of municipal fleets, and will compare it, on an equal budget basis, with the potential for decarbonizing the electrification of household cars.

4. It will produce recommendations on the targeting of electrification subsidies in Quebec supported by the results of Task 3, if the latter is completed.

Expected deliverables

- Project report in Word format with zotero reference
- Zotero bibliography
- Spreadsheets
- Popular article for The Conversation (country/language to be chosen)

Administration and logistics

The project is supervised by :

- Dr. Anne de Bortoli: CIRAIG researcher at Polytechnique Montréal, visiting researcher at Ecole des Ponts ParisTech, in charge of the carbon neutrality research cluster. **anne.debortoli@polymtl.ca**

- Dr. Cécile Bulle: Professor at the Université du Québec à Montréal, Department of Strategy and Social and Environmental Responsibility, School of Management. **cecile.bulle@uqam.ca**

Location: CIRAIG, Polytechnique Montréal, 3333 Queen Mary Road, Montréal, Canada.

Compensation: internship grant of $1750/month.

Duration: 6 months

Application: Interested students should send an application including CV, transcript (bachelor and master) and cover letter to anne.debortoli@polymtl.ca and **cecile.bulle@uqam.ca** . Applications will be considered in chronological order, and positions will remain open until suitable candidates are found.

Skills and prerequisites

- Completion of an advanced LCA course
- Fluency in French, good level of English
- Data analysis
- Autonomy