

DOCTORAL RESEARCH PROJECT (PhD)

Comparative study of a competitive, low-GHG supply chain using short sea shipping

FRENCH LANGUAGE

Although most of our research team at the FORAC consortium are fluent in English and can facilitate your arrival at Université Laval, our students are expected to be able to communicate in French within the first year of their arrival in Quebec City.

Research domain:

Logistics, decision support system, optimization, transportation, forest products industry

Prior education:

Operations management, industrial engineering, mechanical engineering, or another relevant field

Research context:

The FORAC research consortium is a strong partnership between stakeholders in the forest products industry (businesses and governments). Based at Université Laval (Quebec City, Canada), we offer our partners world-class multidisciplinary research expertise. We bring together expertise in the fields of forest engineering, wood engineering, industrial engineering, mechanical engineering, administrative sciences and computer science.

Our mission is to support the forest products industry in the design and effective management *from the forest to the customer*. FORAC aims to be a Canadian and international reference in the field of integration and optimization of the value creation network. Researchers are developing decision support and decision support methods that leverage the potential of data to improve planning, coordination and control of operations across all business lines (forest operations, transport and logistics, processing plants, etc.).

Project description:

Fibre supply to mills relies on a geographically dispersed network of suppliers, with road transportation remaining the predominant mode. Short sea shipping (SSS) operates over regional or domestic routes, as opposed to transcontinental ocean shipping. Given the volumes of fibre moved along the St. Lawrence corridor, the use of SSS offers promising opportunities to redesign the supply network and reduce greenhouse gas (GHG) emissions.

This Ph.D. project aims to develop an evaluation framework for comparing supply-network scenarios that incorporate SSS under various forms of public incentives. The research will include the development of an optimization model for designing an intermodal road-sea network to support scenario analysis and its application to a case study. Scenarios will be assessed using cost, lead-time, and GHG-emission indicators. The resulting tool will identify supply opportunities involving road-sea intermodal transportation and evaluate the multicriteria performance of alternative network designs.

Desired start date: September 1, 2026

Financing:

Scholarship of \$ 27,500 scholarship per year for a length of 11 full-time sessions (i.e. three years and two semesters). This scholarship is indexed once a year. Participation bonuses of up to \$5,250 annually are available. Additional funds are available to cover the costs of participation in international conferences (with article) and travel expenses (collaboration with partners, industrial visits, field study).

To apply:

Interested candidates can apply by sending their application (*including: CVs, transcripts and motivation letter*) to the following email address: recrutement@forac.ulaval.ca or contact the professors: Jean-François Audy, Professor, Department of Management, Jean-Francois.Audy@uqtr.ca, or Mikael Rönnqvist, Full Professor, Faculty of Science and Engineering, mikael.ronnqvist@gmc.ulaval.ca.