

Techno-economic analysis of dual purpose NH₃+CO₂ transport from BC to Asia

For: Senior MSc or PhD; 12 months

Program supported: [Oceans Program](#)

Academic Collaborator	NRC Principal Investigator	Associated NRC Research Centre
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Project Description:

“Green shipping corridors” are being established, including interest in new cargos of hydrogen (H₂) and carbon dioxide (CO₂). The former is challenging to transport in neat form, making liquid organic carriers (LOCs) and ammonia (NH₃) attractive forms for transport. Carbon sequestration sites are being established for CO₂ disposal, however many are dislocated from near term point-sources of CO₂ capture and later stage sites of direct air capture (DAC).

Shipping costs for both applications are challenging to the overall economics, making it attractive to consider transport of NH₃ in one voyage direction, and CO₂ transport in the opposite direction to avoid empty tank cruises. Both chemical species can be transported in a commonly designed tank given temperatures and pressure behavior. This project will carry out techno-economic assessment (TEA) of NH₃ transport from British Columbia to Asia, and return of CO₂ for sequestration. The work explore key unknown aspects such as tank cleaning and design for transport conditions.

Canada has the potential for both carbon sequestration sites on-shore and off-shore, as well as tremendous potential for hydrogen production (“green”, “blue” and “turquoise”). The West Coast of Canada is uniquely placed relative to the Asian market for supply and off-take of both products. This project will advance the understanding of what technical and/or economic opportunities and barriers exist for pursuing such opportunities. It will help the understanding of what infrastructure would be required and help planning for this future blue economy opportunity for Canada.

Student Profile:

- Enthusiasm for clean energy systems
- Courses and/or knowledge of TEA methods and datasets
- Knowledge of ammonia and/or carbon dioxide transport (logistics, tank design, etc.)