

Connecting long haul trucks to overhead electrical lines on highways is being tested as an energy efficient option to support decarbonizing long-haul freight. While the technology is already being tested in Europe and California, pilot projects have yet to be implemented in Canada. This study conducts the first simulation of electric road systems (ERS) in Eastern Canada, based on catenary electric-diesel hybrid truck technology (e-Highway) on a 1,344 km highway connecting Quebec City and Toronto up to the U.S. border (A20-H401 corridor), which concentrates a significant part of long-haul trucking of the region. The simulation tests two scenarios, full and progressive adoption rates, based on a GIS analysis of current flows of heavy trucks (Class 8 and above). Construction of the infrastructure based on an investment of 4.1 billion CAD to deliver yearly GHG emission reductions of up to 3.2 Mt CO₂ equivalent under a 100% adoption scenario. Simple payback period of the infrastructure improves significantly with higher volume of traffic flow, rate of adoption and price of diesel and carbon. This initial study suggests there is value to considering the technology in the mix of options for decarbonizing road freight in Canada. Further analysis is required to understand operational relevance for the truck industry, financing structure and costs and other technical feasibility considerations, including other ERS technologies options and operations under Canadian winters. This simulation is the first step of a broader study proposal developed by the Chair in Energy Sector Management, HEC Montréal and CPCS, in collaboration with government, university and private partners, to compare the costs and potential of different decarbonization technologies along the A20-H401 axis. [View report »](#)