Ryerson University

Centre for Urban Energy

Research case study > electric vehicles

Fast charging station

Version 1 (update May 19, 2017)

Context: Plug-in electric vehicles (EV) which produce little emissions will play a vital role in achieving the provincial emission reduction target of 80 percent below 1990 levels by 2050.

Problem: Range anxiety and long charging times are barriers to EV adoption. The large energy demands of EV charging are also a concern to industry which fears a grid collapse due to overloading.

Solution: A fast-charging station capable of powering up a car battery to 80 percent of its capacity in roughly 30 minutes with a converter that rapidly transforms AC, which the power system uses, to DC which is used by EV batteries.

Impact: This charging station design will help move the industry towards fast-charging and reduce pollution from the transportation sector. It will also help alleviate consumer concerns making EV's more attractive to the public.

CUE's role: CUE researchers studied how to charge EVs quickly, efficiently and cost-effectively. Another component of their work was to determine how to charge EVs without harmonics that can reduce the quality of electricity.

✓ *Completed*

Sponsors:
Hydro One, OCE

Timeline:
January 2013–September 2016

Research team:
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Key stats

93	Charge stations in service
85	Level 3 'fast charge' ports
9,179	EVs in Ontario