Ryerson University

Centre for Urban Energy

Research case study > renewables

Increasing renewable connectivity in Ontario

Version 1 (updated June 28, 2017)

Context: The environmental, economic and political case for renewable energy is compelling. Solar panels are increasingly attractive to many Ontarians due to the Feed-in Tariff (FIT) and microFIT programs launched by Ontario's Ministry of Energy in 2009.

Problem: Limited short-circuit capacity at many transformers has led to FIT and microFIT applications being delayed or denied due to limited short-circuit capacity which is a serious concern for the provincial government, clean energy advocates, and consumers.

Solution: An iterative mixed integer non-linear optimization method is proposed to optimally locate fault current limiters (FCL) in a power system by searching the entire solution space.

Impact: The findings of this project allow Hydro One to optimally allocate, size and study the dynamic interactions of FCL in their transmission and distribution systems while preventing any major system reconfigurations and upgrades.

CUE's role: Researchers crated and assessed an iterative mixed integer non-linear programing method and tested it on IEEE testing transmission systems and a transmission system in Ontario. A comprehensive framework was also presented to design resonant FCLs for bulk power systems.

✓ *Completed*

Sponsors:
Hydro One, OCE

Timeline:
August 2013–September 2015

Research Team:
Bala Venkatesh, Peng Yu, Omid Alizadeh

Key stats

FIT	10KW or more renewable projects
MicroFIT	10KW or less renewable projects
1,120	FIT 5 applications totalling 395MW
91%	FIT projects are solar PV