

Research case study > storage

Flywheel modelling

Version 1 (updated May 9, 2017)

Context: As Canada is gathering more of its energy from renewable sources such as wind power it is important to ensure that there are innovative, sustainable solutions to capturing and storing this power source.

Problem: Though sustainable and easily captured the intermittence of wind power creates challenges for storing, controlling and integrating it into the grid. Slow acting voltage regulators are not capable of preventing temporary low/over voltages.

Solution: ES is a fundamental component of renewable energy sources. Temporal Power's proprietary flywheel can provide instantaneous real power and mitigate voltage issues on distribution lines.

Impact: This technology will make Ontario's electricity system more efficient and flexible. It will also increase the feasibility of wind power integration into the system by removing the challenges of intermittency through storage for future use. There is no degradation of capacity over operational life and components are fully recyclable.

CUE's role: The team tested the flywheel in simulations at the CUE and developed a pc-based control system that will monitor line voltage and activate the system automatically. A theoretical model for potential customers to simulate the flywheel on their system was also created.



✓ Completed

Partners:

Toronto Hydro, OCE, Temporal Power

Timeline:

January 2011–December 2011

Research team:

Bala Venkatesh, Kamran Masteri

Key stats

500kW/50kWh per flywheel
20 years operational life