

Research case study > renewables

Prototype microgrid development

Version 1 (updated May 11, 2017)

Context: A microgrid is a network that combines many energy solutions and that can work independently of a distribution system during an interruption. This can increase reliability, reduce the number of customers affected and significantly decrease the length of an outage.



Problem: PowerStream wanted to determine if one of its feeders could operate as a microgrid. A secondary focus is that components of the microgrids work in different ways: some using alternate current (AC), while others use direct current (DC).

Solution: The Schneider Electric Smart Grid Laboratory (SEGL) physically replicated a feeder attached to PowerStream's Greenwood Transformer Station and added a battery, solar power, and both AC and DC power loads. This allowed PowerStream to successfully test if it could run as an isolated microgrid.

Impact: In addition to confirming the increased reliability from a microgrid on this feeder PowerStream was able to conduct tests without purchasing and installing new equipment, or the risk associated with running tests on live wires connected to homes and businesses.

CUE's role: Researchers designed, built, operated and analyzed the microgrid within the Schneider Electric Smart Grid Laboratory. They ran a number of scenarios to better understand the impact of a microgrid on major urban infrastructure.



Sponsors:

PowerStream (now Alectra Utilities)

Timeline:

November 2014–August 2015

Research team:

Bala Venkatesh, Bhanu Opathella

Key stats

27.6kV	Feeder from PowerStream Station
4	Tests carried out in SEGL
2 modes	Islanded and grid connected