

Energy sourced from **anywhere, anytime**, exchanged instantly, with real financial benefits and rewards for **everyone**



GridExchange enables residential, commercial, and industrial participants to contribute electricity to the provincial grid. This Platform as a Service (PaaS) offering enables the recording of energy transactions between multiple parties in an efficient, transparent, and secure way in real-time via a convenient easy-to-use mobile app and online tools.

The platform records and tracks the energy available for sale from multiple sources. This can include both energy generation resources, such as solar, and energy behaviours, such as scaling down electric vehicle charging during peak demand periods. Energy bids are evaluated and exchanged in an open live market. Participating customers receive incentives to offset the cost of their energy consumption as well as rewards redeemable for value-added services from merchants participating in the GridExchange ecosystem.

Innovating & Collaborating together to:

- ✓ Enable the exchange of energy among homeowners, businesses, utilities and grid system operators
- ✓ Provide an instant record of the energy available for sale and its value
- ✓ Offer a secure, real-time exchange and settlement process, with compensation paid out instantly
- ✓ Encourage the deployment of new clean energy technologies
- ✓ Give customers more control over energy choices

The Challenge

An expected increase in energy demand from electric vehicles, coupled with an aging grid infrastructure, will strain Ontario's power grid. Distributed energy resources (DERs) present a possible solution—it is estimated that solar generation capacity will climb from just 2,000 megawatts (MW) in 2018 to 260 million MW by 2027 on the local distribution system. This presents significant opportunities, but also poses many challenges, including intermittent or unpredictable generation; unexpected fluctuations; potential reduction in power quality, and more. Engaging customers and forecasting the behaviour of distributed energy resources (DERs) presents another challenge for utilities.



Energy sourced from anywhere — grid, solar, battery storage, electric vehicles, demand response programs and much more



Live tracking, with instant record of energy available for sale and its \$ value



Live exchange, with instant settlement and rewards

The Solution

GridExchange is an app and online platform that tracks and delivers real-time information about available energy sources, customer usage, and DER participation history using blockchain technology. By offering an easy way to record and manage energy transactions, GridExchange enables Alectra to better manage the load on the grid, avoiding the need for expensive upgrades while improving the reliability of the electric supply. The platform addresses current and potential use cases for utilities and the grid system operator while providing real-time transparency, tracking, and management of DER participation in energy services. The platform enables a transparent, trusted, and scalable exchange of energy transactions.

PHASE I - PROOF OF CONCEPT (2018-2019)

Alectra launched an initial proof of concept (PoC) to learn the capabilities, limitations and value of a transactive energy platform. In partnership with IBM and Interac, the blockchain-based transactive energy platform was developed and tested with five customers. The solution allowed customers to easily and securely provide energy to Alectra in exchange for rewards, using a mobile application powered by blockchain technology.

PHASE II – GRIDEXCHANGE PILOT (2019 – 2021)

Using lessons learned from the first phase, Alectra is building an end-to-end pilot for residential customers which will be tested on 20 existing POWER.HOUSE customers with residential solar and energy storage batteries. These homes will participate in an energy marketplace powered by blockchain technology using a robust data management and analytics platform.

Benefits



Real-time financial rewards



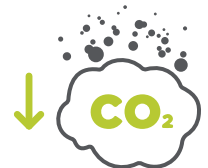
Simplified contracting without individual agreements



Reduced system constraints, with gaps in grid supply resolved instantly



Deferred infrastructure investments, with aging technology replaced with clean energy resources



Incentives to adopt clean energy technologies, reducing greenhouse gas emissions

In Collaboration With



Natural Resources Canada

Ressources naturelles Canada



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