

M'Chigeeng - Quarry Microgrid Energy Project

Location:

Meldrum Bay, Manitoulin Island, Ontario

3G Energy Team:

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Commencement:

2025

PROJECT DESCRIPTION

An international cement producer operates a large quarry at the western tip of Manitoulin Island, close to Meldrum Bay. This quarry and crushing operation is one of the three largest dolomite quarries in Canada.

The quarry and crushing operation is powered by diesel engines to run generators that supply electricity to the quarry machinery. A total of 5.5 MW of diesel generation capacity is operated. The Hydro One grid on Manitoulin Island is not currently available to this industrial load due to the pulsing nature of the quarry's operations.

Diesel fuel is expensive and has high carbon emissions. The quarry seeks a technical solution to achieve eligibility for energy supply from Hydro One's grid because of the lower cost of energy and reduced carbon emissions.

3G Energy undertook feasibility studies on behalf of M'Chigeeng First Nation in 2021– 2024 to demonstrate how grid energy plus renewable energy generation located at the quarry could substantially reduce the quarry's rising costs of energy.

3G Energy Corp identified an opportunity for new technology to be implemented at the quarry that would allow the quarry to partially fulfill its energy requirements using the Hydro One grid, while also using its diesel generation plant to make up for peak loads.



NRCan Smart Grid Demonstration Funding

NRCan support commenced in 2025 for R&D work on a multi-port power control appliance that will allow Lafarge to connect to the Hydro One grid. Goals:

- Allows concurrent draw of energy from the grid with diesel generation balancing for peak loads
- Substantially reduces diesel fuel consumption
- Reduce CO emissions
- Improves social license on Manitoulin Island

WHO:

1. **M'Chigeeng First Nation** is a community on Manitoulin Island with experience in owning and operating renewable energy generation systems. M'Chigeeng developed, owns and operates a 4MW wind farm consisting of two Enercon E-81 wind turbines. M'Chigeeng is a joint venture partner along with 4 other Manitoulin First Nations, with Northland Power on the McLean's Mountain 60MW wind farm on Manitoulin Island. With technical assistance from 3G Energy, M'Chigeeng proposed a project concept for connecting the quarry and crushing operation to the grid.
2. **ADAPTR Inc** is a Canadian technology company offering its Grid Adaptr Advanced Power Conversion System that integrates distributed energy resources into weak grids. ADAPTR Inc is under an NRCan funded contract to develop a technical solution.
3. **The quarry and crushing operator** is Canada's largest provider of sustainable construction materials, producing aggregates, asphalt and paving, cement, precast concrete, ready-mix concrete, and road construction. The quarry and crushing operator is supporting this R&D project, seeking an outcome that may significantly reduce its energy costs, increase resilience of supply, while substantially reducing carbon emissions.

HOW: M'Chigeeng is undertaking the R&D phase of the project with project management assistance from 3G Energy. Anticipated completion is in 2027. The project may lead to a commercial engagement between M'Chigeeng and the quarry operator for the supply and operation of infrastructure that can connect the quarry to the Hydro One grid.

