

ENVITECH ENERGY'S ENVISTORE OPTIMIZER SOLUTION HELPS THE SIQ REDUCE ITS FUEL CONSUMPTION AND CO₂ EMISSIONS



Background:

Diesel generators have always been the solution of choice for off-grid power applications. However, rising fuel costs and CO₂ emissions have prompted the Société Immobilière du Québec (SIQ) to find a better solution.

Goals:

To optimize energy consumption and reduce CO₂ emissions at SIQ's site in Parc de La Vérendrye.

Solution:

Envitech Energy designed, manufactured and installed the Envistore, an energy optimizer that monitors the energy consumption, manages the usage of the on-site diesel generators, and provides peak energy demands through a battery-inverter combination.

Results:

SIQ saved more than 36% of its on-site fuel consumption and achieved its objective to reduce CO₂ emissions by 44 tons per year.

The Need for a More Efficient Energy Solution

Diesel generators have always been the solution of choice for off-grid power applications. Most often, the generator size is selected to provide the peak power demand, which can be only for a very short time period, while the generator operates at a fraction of its rating for most of the day. Unfortunately, operation at a low rating is the least efficient operating point for the generator.

This is exactly the situation that the Société Immobilière du Québec (SIQ) was faced with at their site located at kilometer 426 of the Parc de La Vérendrye. This site is isolated from the Hydro Quebec power grid and consists of 4 buildings that act as a base camp for contractors that maintain the road during winter and ambulance operators.



The rising cost of fuel, combined with the maintenance of its generators, became a substantial part of the SIQ's operational costs. The SIQ initiated a project to control these expenses and address the on-going concern of controlling and reducing CO₂ emissions.

"In the second phase of the project, Envitech Energy will design, fabricate, and install a solar controller that will manage the energy conversion process from solar panels to batteries that will provide power to the SIQ site during the spring and summer months and further reduce CO₂ emissions by 40% per year." Steve Roy, Director of Engineering for Envitech Energy

Envitech Energy's Solution

The SIQ mandated Genivar, a Canadian Engineering Services firm, to find a solution to optimize its site energy consumption. Genivar engaged Envitech Energy to design, manufacture and install the Envistore, an energy optimizer that monitors the energy consumption, manages the usage of the on-site diesel generators, and provides peak energy demands through a battery-inverter combination (commonly referred to as a peak shaving function). This solution is entirely monitored from a satellite communication link, at Envitech Energy's headquarters in Pointe-Claire, Quebec.

The site consists of 3 on-site generators: 1 x13kW and 2 x 32kW units. The Envistore controls the utilization rate of the generators, as well as their usage time to schedule maintenance routines properly. Upon a peak demand, the Envistore will activate its inverter section and provide this peak energy demand through 2 strings of lead-acid batteries. When the peak demand is over, the batteries are re-charged at a reduced rate through the bi-directional inverter that will now act as a battery charger.

AICQ Awards Genivar 2009 Visionary Award

Initiated in 2003, the Grand Prix from the Association des Ingénieurs-Conseils Québécois (AICQ) promotes good practices related to major engineering endeavours and highlights the contribution of consultant engineers in projects that customers judge to be of merit. These projects are evaluated by an independent panel consisting of prominent engineers and scientists. With the important contribution of Envitech Energy, Genivar

was awarded the 2009 Grand Prix du Génie-Conseil Québécois, in the Visionary Award category, for its project entitled "Energy optimization of an isolated site at km 426 of the La Vérendrye wildlife reserve".

Results

The solution has been in service for the last 2 years and has permitted the SIQ to save more than 36% of its on-site fuel consumption and reduce CO₂ emissions by 44 tons per year. The real-time supervision of the system with SMS notification of alarms reduced the downtime period and simplified the coordination of maintenance activities. The system is scalable to enable power growth, if required, and has significantly reduced equipment failures due to poor power quality.

The SIQ has awarded a second phase to this project, which consists of installing solar panels to completely avoid the usage of the generators during the spring and summer months and further reduce CO₂ emissions by 40% per year. Envitech Energy will be responsible of the design, fabrication and installation of the solar controller, which will manage the energy conversion process from the panel to the batteries. This project is planned to be fully functional in early spring 2010.

Key Highlights

- The SIQ saved 36% of its on-site fuel consumption
- CO₂ emissions have been reduced by 44 tons per year
- Genivar was awarded the 2009 Grand Prix du Génie-Conseil Québécois, in the Visionary Award category