# ➡ HµGrid Control System for Hybrid Power Resiliency and Energy Management

Many remote communities and industrial sites rely on power generated from diesel or other fossil fuels. These islanded systems experience high and unpredictable energy costs due to the high price to transport fuel to such remote sites and the volatility of fuel pricing. Environmental costs are also high due to CO2 and other exhaust emissions, noise and the risk of fuel spills.

Integrating renewable power (wind, solar PV, hydro and other forms) and energy storage together with the thermal power plant forms a hybrid power system that reduces reliance on fossil fuels, resulting in lower operating costs and reduction of CO2 emissions and other associated environmental hazards.

However, increasing the contribution of renewables is challenging due to the variable and unpredictable output of non-dispatchable renewable power sources and the increased system complexity. The H $\mu$ Grid capitalize control system utilizes Hatch's many decades of experience in supporting our off-grid mining clients' power systems and as well as our deep expertise in the design and implementation of remote hybrid power systems. H $\mu$ Grid uses intelligent, real-time software that monitors and manages the hybrid power microgrid on a short- and long-term basis, maximizes renew able power contribution and makes the most efficient use of all power system assets, while maintaining power quality and reliability of the system.

We work with you to develop a HµGrid control solution with features that are tailored to your selected energy storage technologies, renewable power sources, existing thermal plant constraints and dispatch rules, specific power system configuration and operational objectives. At the same time, the system is flexible and scalable to meet your future needs.

#### HµGrid Control System Benefits

- Minimize fossil fuel consumption by maximizing the use of renewable resources.
- Reduce thermal plant maintenance costs and prolong the lifetime of power generation and energy storage assets through online optimization intelligence.
- Improve power quality and reliability of supply through high-speed compensation of renewable resource variations and reduction of service interruptions.



Hatch's Microgrid Control System (HµGrid)

## Proven Reliability in Arctic Applications



The HµGrid control system has been operating successfully on Glencore's Raglan Mine 25 kV hybrid power grid since 2015 and is enabling a reduction of 4.3 million litres of diesel fuel per year. The main components of the hybrid system include two 3-MW wind turbines and a 3-MW li-ion battery energy storage system owned by the independent power producer Tuqliq Energy and integrated with the existing Glencore diesel power plant.

Photo courtesy Justin Bulota



Hatch has been selected by NT Energy to provide a microgrid control system as part of a high penetration, islanded hybrid power system for the town of Inuvik located in Northwest Territories, within the Arctic Circle. This project involves integration of wind power, solar PV and battery energy storage.

## Renewable Power Integration Challenges



## ╋ HµGrid Functional Highlights

### Minimize fuel consumption (100% renewable operation capability)

HµGrid enables operation of the system with the minimum number of fossil fuel genets online up to and including operation with 100% renewable power contribution.

In this mode, HµGrid uses the energy storage system to form the grid. The system can be engineered to transition to and from 100% renewable mode without loss of supply continuity.

#### Enhance power system stability

HμGrid is more than just an energy management system. Integration of renewables will decrease power system inertia and increase net load variations on the power system. HμGrid enhances system stability via dynamic determination of required spinning reserve, as well as fast detection and response to rapidly changing power supply conditions such as fluctuations of the wind speed, sudden outages of renewable assets, or load variations.

### Optimize operating costs by real-time predictive dispatch

HμGrid includes a real-time, predictive, mathematical optimization engine that manages the microgrid, balancing the renewable and load forecasts. HμGrid provides dispatch commands to microgrid elements based on forecasts on renewable power and load, operating costs of assets (such as battery and diesel gensets), and operating constraints of equipment to attain the optimum operating point to extend useable asset life and operating efficiency.



#### HµGrid Features

#### Contacts

#### Mohammad Sedighy

Hatch Technologies Tel: 905.403.3996 mohammad.sedighy@hatch.com

#### David Delves

Hatch Power Tel: 905.491.7466 david.delves@hatch.com