

Marquette Energy Center

CASE STUDY



Reliable power to the end of the transmission line – and additional profit to the owner

When the temperature drops to -40 degrees Celsius, blackouts are not an option. In order to secure a reliable energy supply and enable more renewable energy, Marquette Board of Light and Power (MBLP) in Michigan, USA, opted for Wärtsilä Smart Power Generation technology. As an added benefit, the ultra-flexible power plant provides a new source of income by following real-time electricity prices. The dual-fuel plant replaces old coal-fired capacity.

“We have a reliability problem due to ageing coal units, no firm transmission service, and the closure of a 400 MW coal power plant. Wärtsilä’s solution is reliable, efficient, flexible in fuel choice, and also environmentally sustainable. It will support our compliance with upcoming CO₂ regulations.”

Paul Kitti
Executive Director of MBLP

KEY DATA

CUSTOMER

Marquette Board of Light and Power (Utility)

TYPE

Wärtsilä 50DF multi-fuel power plant

OPERATING MODE

Peaking and back-up baseload

GENSETS

3 x Wärtsilä 18V50DF

TOTAL OUTPUT

50 MW

FUEL

Natural gas, light fuel oil as back-up

SCOPE

Engineered Equipment Delivery (EEQ)

DELIVERED

2017

Marquette, a town of some 20,000 people in northern Michigan, sits at the end of the region’s transmission line. Until now, the town has relied on two coal units and some hydro power, with about 10 percent of the town’s electricity imported from a utility further south. The coal units, however, are getting old.

“That is a big part of the driver to install these Wärtsilä units. We had to take care of our own reliability, since we couldn’t depend on the outside world anymore. We’re living on the ragged edge, and if we continue doing that we’ll be like some other communities that go black for several hours a day, but that’s unacceptable when it’s minus 40 degrees Celcius,” says Paul Kitti, Executive Director, Marquette Board of Light and Power (MBLP).

With the Wärtsilä solution, availability at any time is guaranteed by the multi-unit design, black start and instant ramping capability. Reliability is further enhanced with the dual-fuel feature. The three Wärtsilä 50DF engines will run primarily on natural gas and use light fuel oil as back-up.

Many residents told the public utility board that they wanted more renewable energy. The utility held several community meetings and was able to convince the residents that the Wärtsilä option would provide a strong foundation for adding more green energy in the future. Because of its agile load-following operational ability, Smart Power Generation plants support wind and solar energy by rapidly filling the gaps in their output.

“The plant will also support our compliance with upcoming carbon emission regulations,” Paul Kitti says. As part of the sustainable approach by MBLP, a community solar park will be installed to the power plant site. In addition, the power plant will serve as a new source of income for MBLP in the real-time electricity market.

“Thanks to the ability to bring up the Smart Power Generation plant in less than 5 minutes, we will be able to follow electricity price spikes and sell power to the grid,” says Kitti.

The new business model has been proven by Wärtsilä’s power plant customers in other real-time electricity markets in the USA. The engines can be quick-started whenever the prices show profit, and dispatched to follow price variations in almost real time.

MBLP is a municipal electric utility serving approximately 17,000 customers in Marquette county in the Upper Peninsula of Michigan.



Thanks to the fast-reacting engines, the power plant can be dispatched any time the electricity prices show profit.

CHALLENGE	WÄRTSILÄ’S SOLUTION	BENEFIT
Add intermittent wind and solar	Flexible back-up power	Enable more renewables
Cold climate, remote location	Reliable energy supply	Keep the lights on at all times
Upcoming carbon regulations	Efficient gas power	Meet emission requirements



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