



## PROJECT PROFILE

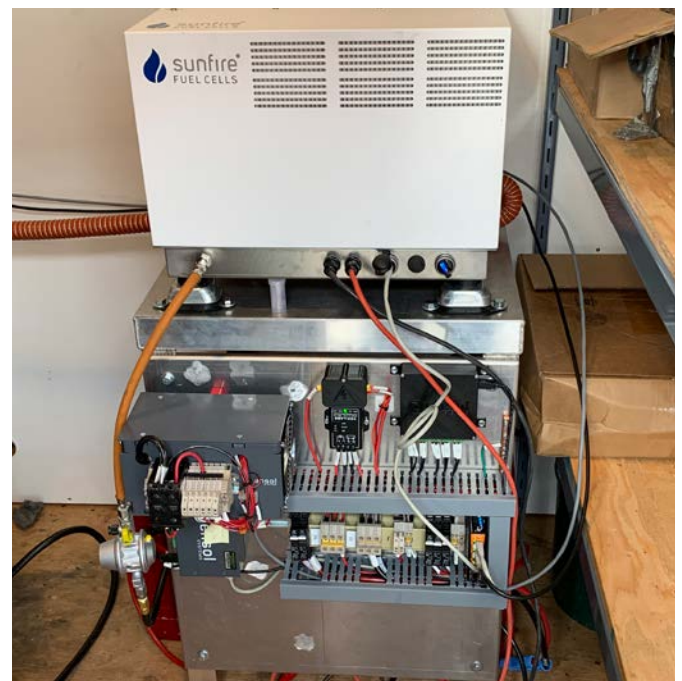


# German fuel cell technology reliably supplies off-grid infrastructure in Canada with electricity

Canada is the second-largest country in the world, with a land area of almost ten million square kilometres. Considering the size of the country, its population of around 38.45 million is relatively small. The population density is also correspondingly low, at around 4.2 inhabitants per square kilometre. Given these natural conditions, it goes without saying that nationwide infrastructure projects will face particular challenges. These projects have to cover large geographical distances, and the country's technical utilities also have to be reliably supplied with electricity, even in off-grid regions. Fuel cell technology is a viable option for tackling these challenges, even in extreme weather conditions.

A new project has been implemented as part of the Renewable Energy Solutions Programme (RES Programme), which is one aspect of the Federal Ministry for Economic Affairs and Climate Action's (BMWK) German Energy Solutions Initiative. This project focuses on two different systems that use fuel cell technology to supply energy. One of the two systems provides power to a radio station at

an altitude of almost 2,500 metres. The other supplies an autonomous drone station in northern Alberta with electricity. Both systems were installed by German company NEW ENERDAY GmbH



Remote fuel cell generator as a winter power supply for a radio and observation station



Autonomous drone station in northern Alberta

(known as Sunfire Fuel Cells GmbH until the end of 2023), in cooperation with its local partner Ensol Systems Inc. In British Columbia and Alberta, Ensol is an established provider of off-grid power solutions for difficult-to-access regions with extreme weather conditions – particularly extreme cold. German company NEW ENERDAY GmbH specialises in providing energy solutions using fuel cell technology for off-grid infrastructures worldwide.

Its Remote 400 system was used to supply power to a fire watch tower with a radio station on a remote mountain peak west of Calgary at an altitude of 2,473 metres. The high-temperature solid oxide fuel cells (SOFC) can be operated with widely available and inexpensive propane, without stacks or exhaust pipes freezing or oil needing to be changed. Since the Remote 400 was installed, it has reliably supplied the radio station with power during the winter months – ideal for a station that is only accessible on foot or by helicopter. While sufficient solar energy is available via photovoltaic modules in the summer months, icy winds and temperatures of below -30°C in winter make it difficult at times to supply the radio station with energy. However, fuel cell technology ensures that the station can operate autonomously for a period of at least three

*‘We are always on the lookout for new technologies that trigger a surge in innovation, and we are delighted that Sunfire Fuel Cells allow us to pass this innovation on to our customers.’*

Jim Brasset, Vice President of Technology Development at local partner Ensol

months. By installing the Remote 400, users can improve their operational reliability and reduce not only costs but also emissions. For this particular application, the fuel cell generator supplied by NEW ENERDAY GmbH was supplemented with a combined load management, communication and monitoring system from Ensol Systems and integrated into an existing photovoltaic battery system from Alberta Wildfire.

An autonomous drone station in northern Alberta also needed a power supply that would allow it to operate independently for a longer period of time – at least 30 days in this case. Critical infrastructure facilities in these remote areas require regular inspections. Until now, these inspections were carried out using expensive and environmentally harmful aeroplanes – reason enough to look for an alternative that is both lower in emissions

and more cost-effective. Once again, installing a Remote 400 propane fuel cell was the solution here. Here, it was combined with an innovative autonomous drone-in-a-box solution from Ensol Systems and Chartis Remote Sensing, a Canadian company specialising in autonomous drones. This cost-effective and environmentally friendly alternative to inspection flights also allows drone-based inspections to take place several times a day, without having to rely on a pilot; the solution is independently connected to a cloud. The system offers the option of self-charging the drone as well as automatically uploading data for smooth continuous operation. The system is easy to transport,

which saves significantly on cost. It also offers considerable environmental benefits and can be operated autonomously for long periods of time.

The applications on display in the RES project in Canada are an impressive demonstration of the fact that NEW ENERDAY GmbH's fuel cell technology is particularly suitable for supplying power to off-grid infrastructure in sectors such as telecommunications, railway transport and pipelines. The RES project also involved a number of marketing campaigns to publicise the installation of the two systems; dena actively supported the planning and organisation of these campaigns.

## Company Description

NEW ENERDAY

NEW ENERDAY, formerly Sunfire Fuel Cells, combines over 15 years of technological expertise in the development and manufacturing of fuel cell stacks and systems. Our main focus today is off-grid energy solutions that provide clean fuel cell power to remote locations and infrastructures worldwide. The company is based in Neubrandenburg, Germany, where the fuel cells are developed, produced and carefully tested before being delivered to customers.

### System Information

Electrical capacity:	Between 60 and 350 W
Maximum daily electrical capacity:	8.4 kWh per day
Fuel consumption:	Propane: 75 to 106 g/h (0.17 to 0.23 lbs/h)
Weight:	65 kg
Dimensions:	660 × 540 × 400 mm
Operating temperature range:	-20 to +55 °C (optionally down to -40 °C)

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