



NorthWestern Energy pilots new solar-powered microgrid technology in Yellowstone National Park

The West Thumb area of Yellowstone National Park features a small geyser basin on the shore of Yellowstone Lake.

It's certainly not one of the most popular destinations in the park, but it's a great spot to see the juxtaposition of cold lake water and boiling hot springs. West Thumb offers a few bathrooms and a small bookstore, housed in a historic ranger cabin.

At one point, West Thumb was the site of a large campground, cabins, a photo shop, a cafeteria and a gas station.

"This used to be a pretty big place," said Jack A., who was been working as a lineman in Yellowstone for 34 years.

As the electric provider for Yellowstone National Park, NorthWestern Energy once had a substation to serve West Thumb. In the 1980s, the National Park Service

removed most of the services at West Thumb in an effort to protect the geyser basin. Eventually, NorthWestern removed its power lines and poles in the area as they began to age and were no longer needed. The small bookstore, which is only open in the summer, used a generator for power.

A few years ago, the Park Service requested that NorthWestern Energy again provide power to the West Thumb area.

Rather than build new power lines to the area, NorthWestern decided to test a new technology. In late May, we installed a microgrid in West Thumb. The micro grid is completely isolated from the power grid. A solar array charges super capacitors that supply power to the bookstore.

Capacitors are similar to batteries. They store electrical energy in the form of an electrical charge. A capacitor

can accumulate power when it's connected to a power source, in this case the solar panels when the sun is shining. That energy can be released when the power source goes away.

"Capacitors store energy, and they've been around forever," said Pat P., manager of the NorthWestern Energy Bozeman Division. "There are a lot of advantages to them."

The capacitors are as efficient as lithium ion batteries, but can function in a wider range of temperatures, anywhere from 30 below to 120 degrees Fahrenheit.

The microgrid at West Thumb has about 200 kilowatt hours of storage capacity. The bookstore needs about 30 kilowatt hours per day, so the microgrid could run for four to six days without the sun shining. Since the store is only open spring through fall, the storage should be more than adequate.

Since the microgrid was installed in around Memorial Day, it's been running smoothly.

Of course, there are some issues that are unique to Yellowstone Park. For example, crews had to be extra careful when boring a hole to run an underground line to the bookstore.

"They were a little worried about running into thermal features," Pat said.

The solar panels had to be high enough that elk couldn't rub against them, and the wiring was installed in a way that would prevent elk from snagging their antlers on it.

The West Thumb microgrid is the first time NorthWestern Energy has used microgrid technology, but we're already planning a second microgrid at the Bechler Ranger Station in the southwest corner of Yellowstone National Park that should be installed next spring.