

# Make it Electric



Energy information to help you manage your operation • August 2011



## A new place for veterans to call home

This land is their land. Residents of the North Dakota Veterans Home can lay more claim to this land than most. They served to protect it, many were wounded for it, and some saw comrades die for it. And now, in this new veterans' facility, the land is helping to take care of them.

The new Veterans Home in Lisbon, North Dakota, is an entirely electric facility with a \$3.2 million geothermal heating and cooling system. During the winter the system draws heat from the land to keep the veterans warm, and during the summer it pulls heat out of the building and discharges it to the land to keep them cool.

Compared with the previous facility, the new Veterans Home provides improvements that Administrator Mark Johnson says were overdue. "It comes down to what our residents deserve," he said. "Our job is to provide the best care possible for these veterans, and this facility is helping us to do that."

### Continuing a history of caring

The new Veterans Home, a \$36 million facility on the east edge of the former Old Soldiers Home campus, continues a long history of caring for North Dakota's veterans.

Congress created the home in 1887, but the first buildings were not completed until August 1893 with funds appropriated by the First Legislative Assembly, which called for "the erection of a Soldier's Home at Lisbon." The first barracks was a two-story structure that included two dormitories, each of which housed 15 residents and a 6-patient hospital. The first resident, 73-year-old Civil War veteran George Hutchings, moved in on August 2, 1893. Multiple outbuildings were added to the Soldier's Home campus over the years, and major addition and remodeling projects were completed in 1950, 1980, and 1990.

*Mark Johnson - Administrator*

---

*"These veterans have gone to the extreme to serve our country. With this facility, we're able to go as far as is technically possible in giving them the care they need."*

---

Planning for the new Veterans Home began in 2006 after the staff discovered a potential fire-hazard issue with the air-exchange system. Fixing the problem would have cost nearly as much as constructing a new building. Construction started on the new building in May 2008, and veterans moved into the 171,000-square-foot single-story facility in May 2011.

The new Veterans Home features three wings with 98 basic-care and 52 skilled-care beds in mostly single-occupancy rooms that, all told, accommodate 150 residents. The

*Continued . . .*

wings branch off from a central section that houses the main institutional kitchen, business offices, and a medical office. It also features amenities such as a pool hall, chapel, theater, barber shop, post office, bank, library, and canteen. Tables and chairs tucked into nooks in hallways that lead to the wings provide areas where residents can relax and visit.

Two of the wings provide basic care, the third is for skilled care, and each wing comprises four neighborhoods. Each wing has a secondary kitchen shared by its neighborhoods, and each neighborhood has a living area, dining area, and 13 resident rooms.

Every room has an individual heat pump and thermostat that allow residents to control their own environments. Outside, adjacent to each living area, is a courtyard with green space and gardens. Inside, above windows overlooking the courtyards, electric ceiling tiles provide radiant heat from the geothermal system.

The new facility employs approximately 200 people. About 120 of those are universal staff members who share all the duties—with the exception of providing physical care—from cleaning and cooking to helping residents with their daily tasks.

All of the building's lighting, heating, cooling, air-exchange, and other environmental systems are powered with electricity. The actual heating and cooling, though, come from underground.

## The land is where the heat is

Geothermal is the most efficient heating and cooling system on earth. Businesses and organizations that use it gain more than 300 percent efficiency while positively impacting the environment. Because geothermal systems deliver more than three units of heat for each unit of energy used, they reduce costs by up to 70 percent. And it's a clean energy solution that renews naturally and continuously.

Geothermal is made possible by the fact that ground temperatures generally remain fairly consistent throughout the year. Even when air temperature is 10 degrees below zero in our region, ground temperature stays around 45 to 50 degrees beginning around five feet below the surface.

---

*Geothermal is the most efficient heating and cooling system on earth. Businesses and organizations that use it gain more than 300 percent efficiency while positively impacting the environment.*

---

Geothermal systems simply move the heat that already exists underground into buildings. During the summer the process is reversed to take heat out of buildings and pump it back into the ground.

Closed-loop systems, like in the Veterans Home, are the most common. These systems use tubing that is buried in the ground—either vertically or horizontally—and connected to a heat pump inside the building. The sealed tubing is filled with a liquid that circulates through the system.



In the winter the liquid in the loop is warmed by the earth and routed to the heat pump. There, heat is extracted in the heat exchanger and used to heat the building. In the summer the process can be reversed by selecting the thermostat's cooling mode. The system then

extracts heat from inside the building and discharges it through the ground loop.

Open-loop systems operate on the same principle, but they do not require a system of closed piping. In these systems, well water is pumped to the heat pump and then is discharged. In the process, the heat pump transfers heat to and from the building, *in* during the winter, *out* during the summer.

## Pumping up the payback

The geothermal system in the new Veterans Home includes 738 wells outside and 180 heat pumps inside. The initial installation cost was significantly higher than that of traditional heating and cooling systems, said Johnson, but in the long term the system will pay for itself several times over.

Engineers on the project compared geothermal with propane and a dual-fuel boiler. Because costs for propane and heating oil fluctuate significantly from year to year and even season to season, it's difficult to nail down an exact payback timeframe. Bob Sitzmann, Otter Tail Power Company energy management representative, expects the system will pay for itself in about 15 to 18 years.

"That sounds like a long time," Sitzmann said, "but when you consider the fact that this facility has been here for

*Continued . . .*





more than 100 years and probably will be here for another 100, it makes sense.”

## Caring for America's heroes

In its administrator's view, the new facility just makes sense too. Johnson said veterans have settled into their new home and are enjoying all the amenities. It's a far cry from the previous building, where two-to-a-room accommodations were standard, up to ten residents shared a single bathroom, and the multilevel configuration forced residents to wait for elevators to get to their rooms.

In addition, high-tech features of the new facility, such as computer-controlled lifts and automatic baths in the skilled wing, are allowing the Veterans Home to serve a new generation of residents.

“Our newest residents will be veterans who served in the Middle East. Many of them have mental health issues and many are polytrauma residents who maybe have lost multiple limbs and have psychiatric issues, as well,” Johnson said. “These veterans have gone to the extreme to serve our country. With this facility, we're able to go as far as is technically possible in giving them the care they need.”

# Optimize efficiency through recommissioning



## Minnesota commercial and industrial customers may qualify for incentives

*Is your building operating as efficiently as possible? It's worth your while to find out—especially when recommissioning can save you 5 percent to 15 percent on your energy bills. Upgrades typically pay for themselves in energy savings alone within an average of less than two years!*

### Recommissioning Program

Otter Tail Power Company's Recommissioning Program (RCx) covers both recommissioning and retrocommissioning.

*Recommissioning* is a process that ensures that a previously commissioned building is running at optimal performance.

*Retrocommissioning* is a process for tuning up an existing building that never was formally commissioned. The retrocommissioning process identifies less-than-optimal performance in an existing facility's equipment, lighting, and control and process systems and calls out necessary energy-saving adjustments.

### RCx benefits

As part of our Minnesota Conservation Improvement Program an approved customer completing an RCx study is eligible for a rebate of 50 percent of the study cost, up to \$20,000. In addition, the customer may be eligible for other Otter Tail Power Company rebate programs. Those programs provide cash incentives for energy-efficient upgrades such as lighting, motors, adjustable-speed drives (ASD), geothermal and air-source heat pumps, and refrigeration equipment. Unique projects may be eligible for our custom energy-efficiency grants.

#### Other benefits include:

- A more comfortable facility.
- More efficient operations.
- Longer equipment service life.
- Lower energy bills.
- Credits for green-buildings programs, such as Leadership in Energy and Environmental Design (LEED) and Green Globes, and points for Energy Star certification.
- A thorough building assessment by qualified engineering professionals.

#### Eligibility requirements:

- Facility must be 25,000 square feet or larger.
- Customer must have a completed and approved RCx application form.

## Learn more

Take advantage of significant energy and money savings. Call our **Idea Center** at **800-493-3299** or your Otter Tail Power Company representative listed on the back of this newsletter for more information about our **RCx Program**.



215 South Cascade  
Fergus Falls, MN 56537

**Make It Electric** provides information for industrial and commercial customers interested in energy efficiency, increased productivity, and new technologies.

Industrial Services  
Otter Tail Power Company  
215 South Cascade  
Fergus Falls, MN 56537

800-493-3299

Fax: 218-739-8941

www.otpco.com

## Increase your efficiency through technology

Large capital outlays impact productivity in any business. Our industrial services engineers and energy management representatives can help you identify and evaluate energy-efficient productivity-increasing technologies for your business. In addition to understanding operational requirements and advantages, they will conduct rate and payback analyses. Contact your representative today!

## Contacts



**Mark Remer**

Senior Industrial Services Engineer  
Fergus Falls  
218-739-8967  
mrem@otpco.com



**Brad Nelson**

Energy Management Representative for Millbank and Wahpeton areas  
605-432-4713 ext. 6602  
bnelson@otpco.com



**Paul Aasgaard, P.E.**

Senior Industrial Services Engineer  
Fergus Falls  
218-739-8492  
paasgaard@otpco.com



**Bob Sitzmann**

Energy Management Representative for Jamestown, Oakes, and Garrison areas  
701-253-4703  
bsitzmann@otpco.com



**Maverick Thompson**

Senior Industrial Services Engineer  
Jamestown  
701-253-4708  
wthompson@otpco.com



**Craig Farstad**

Energy Management Representative for Fergus Falls area  
218-739-8681  
cfarstad@otpco.com



**Jeremy Rham**

Senior Commercial and Industrial Services Engineer  
Fergus Falls  
218-739-8333  
jham@otpco.com



**Bill Kiyve**

Energy Management Representative for Morris area  
800-630-7358  
bkiyve@otpco.com



**Scott Sigette**

Energy Management Representative for Rugby, Langdon, and Devils Lake areas  
701-662-4876 ext. 740  
ssigette@otpco.com



**Terry Stallman**

Economic Development Consultant for Minnesota, North Dakota and South Dakota  
800-630-7965  
tstallman@otpco.com



**Ken Johnson**

Energy Management Representative for Crookston and Bemidji areas  
218-739-8530  
kjohnson@otpco.com