



## SOLUTION AT A GLANCE: TARGETING ENERGY EFFICIENCY WITH LOW-ENERGY DESIGN AND RENEWABLES AT GUNDERSEN HEALTH SYSTEM'S SPARTA CLINIC

### SECTOR

Commercial

### BARRIER

Identifying or evaluating energy-saving technologies

### TOOL TYPE

Case Study

### BUILDING TYPE

Healthcare, Clinic or other outpatient health care

### TECHNOLOGY

Renewable Energy, Solar PV, Zero energy/ZE ready

### OVERVIEW

As part of its Envision Sustainability Program, Gundersen Health System is pursuing energy efficiency through low-energy design standards coupled with renewable energy. Gundersen Health System's 35,000-square-foot Sparta Medical Clinic, located in Sparta, Wisconsin, opened in January 2017. The clinic provides residents in and around Sparta with access to medical care, physical therapy, digital mammography, cardiac rehabilitation, and more. The clinic's interior design is part of Gundersen's commitment to improving the health of the environment and the communities it serves by powering its buildings with clean, renewable energy.

Sparta Clinic was built with sustainable design features aimed at achieving its energy usage goal of 35 kBtu/sq. ft. In May 2017, the clinic was certified LEED Gold for Building Design + Construction. It has already surpassed its energy savings goal by 9 percent after being open just over a year. Sparta Clinic was one of the organizations that was recognized at the USGBC Wisconsin's Transformation Leadership Awards for successful sustainability practices and helping to drive the green transformation of Wisconsin. This early success was a result of facility and operational staff maintaining an "energy-conscious attitude."

In Sparta Clinic's design stage, a variety of sustainability features were considered and implemented to enable the clinic to generate its own energy and use as little power as possible. Starting with a goal of 35 kBtu/sq. ft. – a measurement of energy consumption that translates to 50 percent less than what the average clinic uses today – Sparta Clinic now only consumes 33 kBtu/sq. ft. The clinic integrates the use of both on-site and off-site solar, with a rooftop array of solar photovoltaic panels capable of producing 100 KW of energy and 220 KW of solar energy purchased from a nearby Xcel Energy community solar garden. The combination solar power generates enough renewable energy to offset the building's consumption. As of June 2018, the solar photovoltaic panels have produced more energy than the building has consumed establishing the clinic as an energy independent facility.

An additional renewable feature of the facility is the geothermal wells used for heating and cooling. The design team collaborated with an energy modeling consultant to evaluate two HVAC system options early on in construction, a central Air Handling Unit with Variable Air Volume systems, and a distributed geothermal heat pump system. A distributed system yielded a higher energy reduction of 15 kBtu/sq. ft. As a result, 40 geothermal wells, all 300 feet deep, were installed to heat and cool the building.

Gundersen met its goal in by combining solar and geothermal with a variety of energy efficiency building features:

<b>Heating and Cooling</b>	
<b>Decentralized heat-pump system</b>	Reduces fan power and moves air from cool space to warm areas and vice-versa
<b>Heat recovery ventilation system</b>	Transfers energy from exhaust air to incoming air during cool weather and from incoming air to exhaust air during warmer weather.
<b>Ground source heat pump</b>	Services the hot water heater a ground source heat pump was installed.

<b>Building Materials</b>	
<b>Spray foam insulation</b>	Covers gaps in the walls and reduces energy use by almost 5 kBtu/sq. ft. with the same thermal resistance R value as rigid insulation.
<b>Thermally broken door and window frames</b>	Acts as insulating barriers between the inside and outside of the window and door frames.
<b>Double pane windows</b>	Conserves energy in colder and warmer months

<b>Lighting and Controls</b>	
<b>Occupancy sensors</b>	Reduces lighting and HVAC use when space is not being utilized

<b>LED interior/exterior lighting and controls</b>	LED lighting with manual dimming were installed throughout the building. LED lighting was installed through the exterior to 6.87 kW, 50% below baseline allowance.
<b>Building Automation System</b>	Controls the mechanical system to employ advanced system optimization strategies.
<b>Plug load controls</b>	IT system power management software was integrated to ensure PC's and monitors enter sleep mode resulting in a plug load reduction from 50% to 5% (6 kBtu/sq. ft. reduction).

Within a year, these efficiency measures have resulted in over \$68,500 in savings for the Gundersen Health System.

#### Resources:

- [Gundersen Sparta Clinic Honored with 'Green' Award](#)
- [Sparta Clinic Grows Gundersen's Sustainable Footprint](#)

