CERTs Energy Storage Workshop
Case Study:

Quarry Hill Nature Center
Prairie House
Solar Battery Installation

By Solar Connection, Rochester, MN
Solar installation 2017
Battery installation 2020

Bonus: Info on
Werner Electric, Cottage Grove, MN
Getting set up
Unpacking the battery. The tow straps are for the camels we used to transport it.
Prepare the inverter

What does this button do?
We can leave it on the floor, right?

First you use your back...

Thank goodness there's a first aid kit
Couldn’t we just put in some double A’s?
Mercedes AA Class – photo courtesy of Saturday Night Live
Drilling on a 450V battery...nah, you don’t need to watch what you’re doing.
Leftover parts....
I’m sure there’s a broom and a rug around here somewhere.
There’s a battery in there!
Who?
No, he’s on first.
Online monitoring shows energy flow in real time

<table>
<thead>
<tr>
<th>Energy today</th>
<th>Energy this month</th>
<th>Lifetime energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.46 kWh</td>
<td>652.64 kWh</td>
<td>23.57 MWh</td>
</tr>
</tbody>
</table>

- **5.84 kW**\[\rightarrow\] **0.71 kW**\[\rightarrow\] **5.07 kW**

- **100%**\[\rightarrow\] **0.06 kW**

**Site Status**
- **ID**: 605436
- **Name**: Prairie House
- **Address**: Silver Creek Road Northeast, Rochester, Minnesota, United States...
Typical unoccupied day before battery 7/1/2020
Typical unoccupied day with battery 9/22/2020
### Before battery

<table>
<thead>
<tr>
<th>Date</th>
<th>Production</th>
<th>Consumption</th>
<th>Self-consumption</th>
<th>Export</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/01/2020</td>
<td>29.25 kWh</td>
<td>5.08 kWh</td>
<td>1.59 kWh</td>
<td>27.66 kWh</td>
<td>3.49 kWh</td>
</tr>
</tbody>
</table>

### After battery

<table>
<thead>
<tr>
<th>Date</th>
<th>Production</th>
<th>Consumption</th>
<th>Self-consumption</th>
<th>Export</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/22/2020</td>
<td>37.89 kWh</td>
<td>17.1 kWh</td>
<td>12.06 kWh</td>
<td>25.83 kWh</td>
<td>5.04 kWh</td>
</tr>
</tbody>
</table>

### Battery Details
- **0 kWh from batteries (0%)**
Werner Energy Storage

- Commercial & Industrial

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Demand Profiles

Date Range: 2/11/2019 - 3/11/2019

Max NC Demand: The charts below show when the maximum non-coincident (NC) demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.

Max Demand Before 3/4/19 10:00am

Max Demand After 2/15/19 10:45am

Legend:  
- Demand Before
- Solar PV
- Energy Storage
- Demand After

Max On-Peak Demand: The charts below show when the maximum on-peak demand for this facility occurred before and after the hybrid Solar PV with Storage system simulation.
Commercial/Industrial electric bills include 2 major charges

- **Energy Charge**
  - The total Kilowatt hours of energy you used
  - ¢/KWh

- **Demand Charge**
  - The peak usage in a billing cycle
  - $/KW
What is Demand Charge Management?
What is Demand Charge Management?