

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



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Getting set up

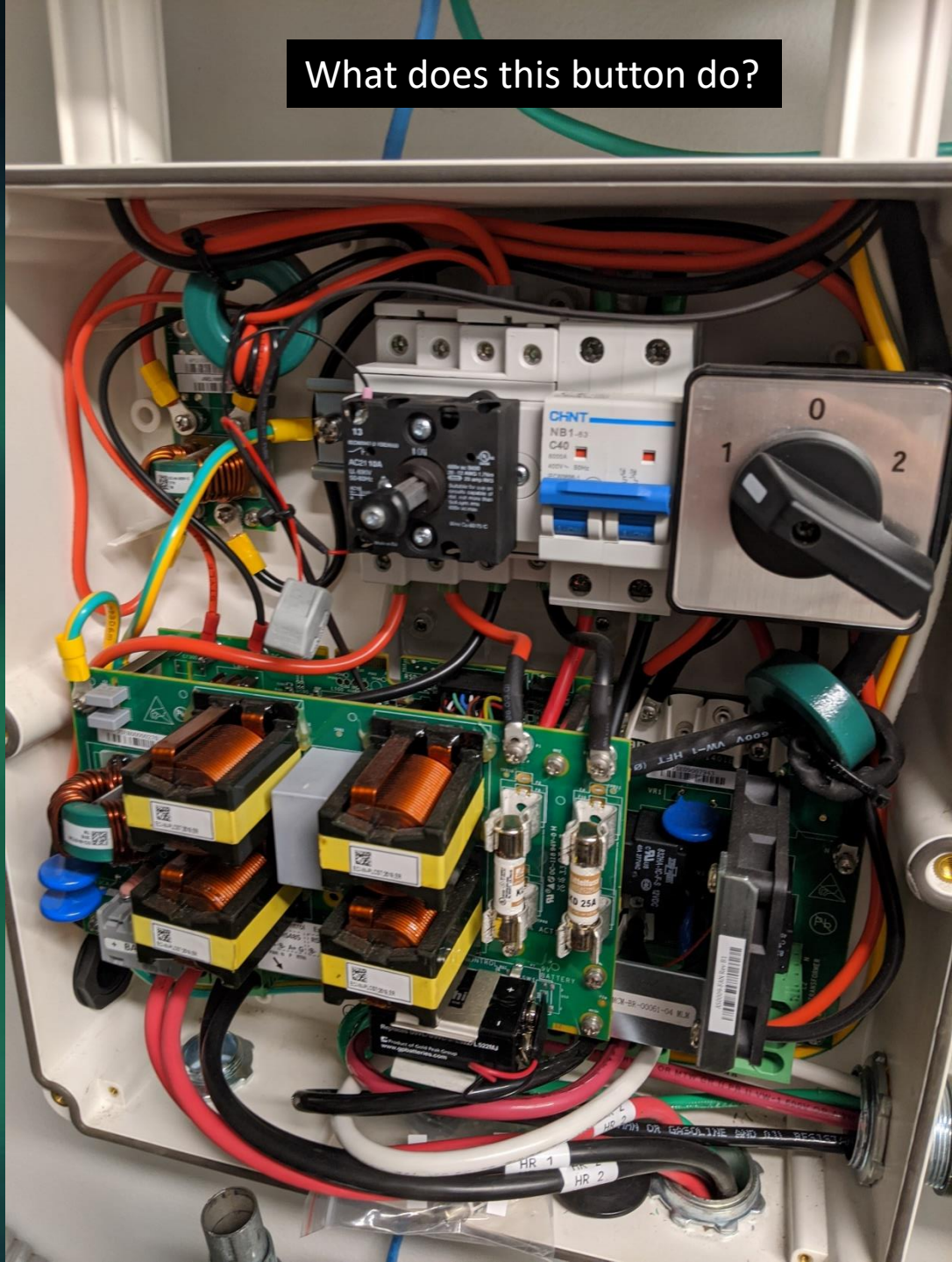


Unpacking the battery. The tow straps are for the camels we used to transport it.

Prepare the inverter



What does this button do?



We can leave it on the floor, right?

First you use your back...

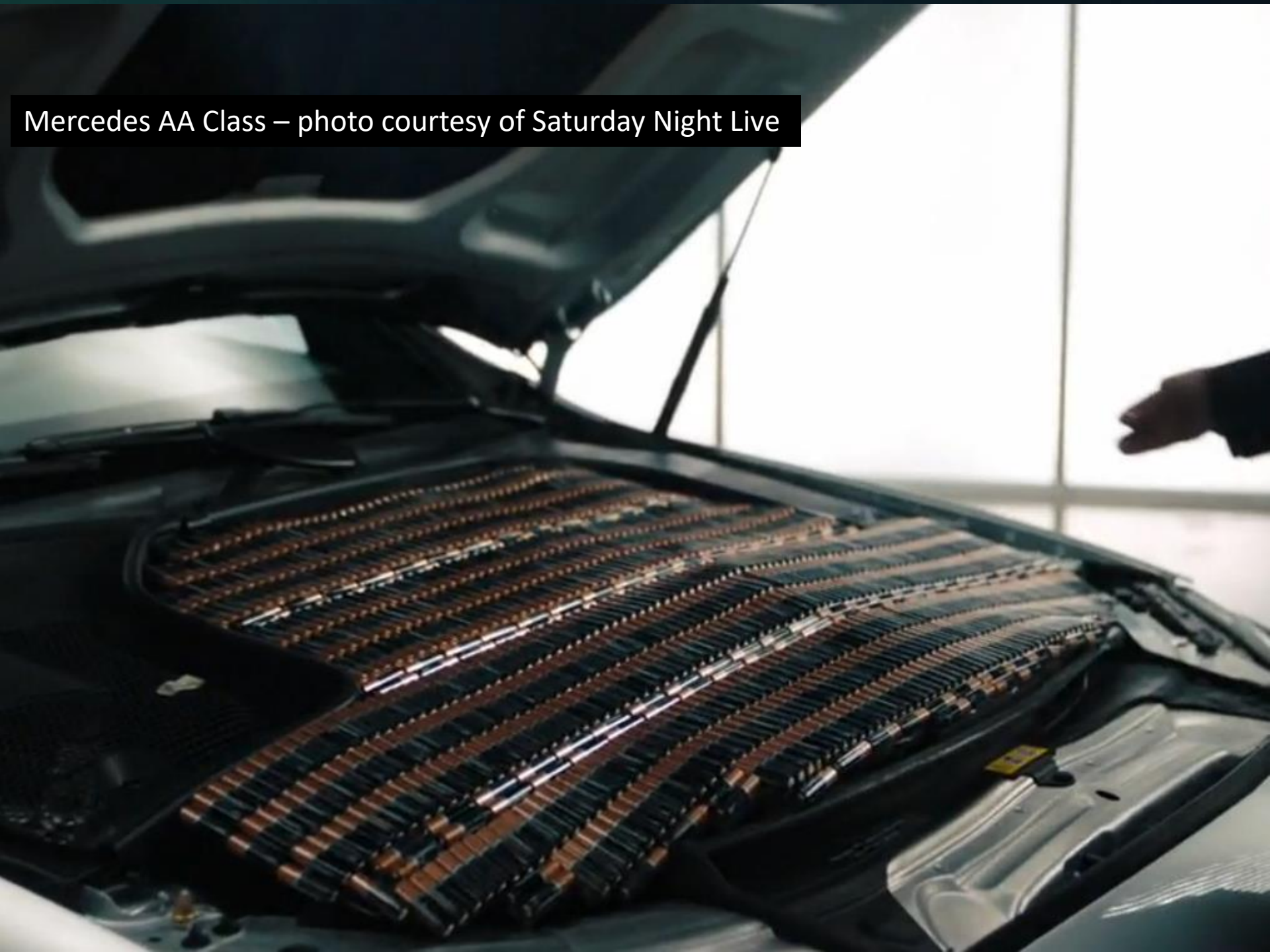
Thank goodness there's a first aid kit





Couldn't we just put in some double A's?

Mercedes AA Class – photo courtesy of Saturday Night Live

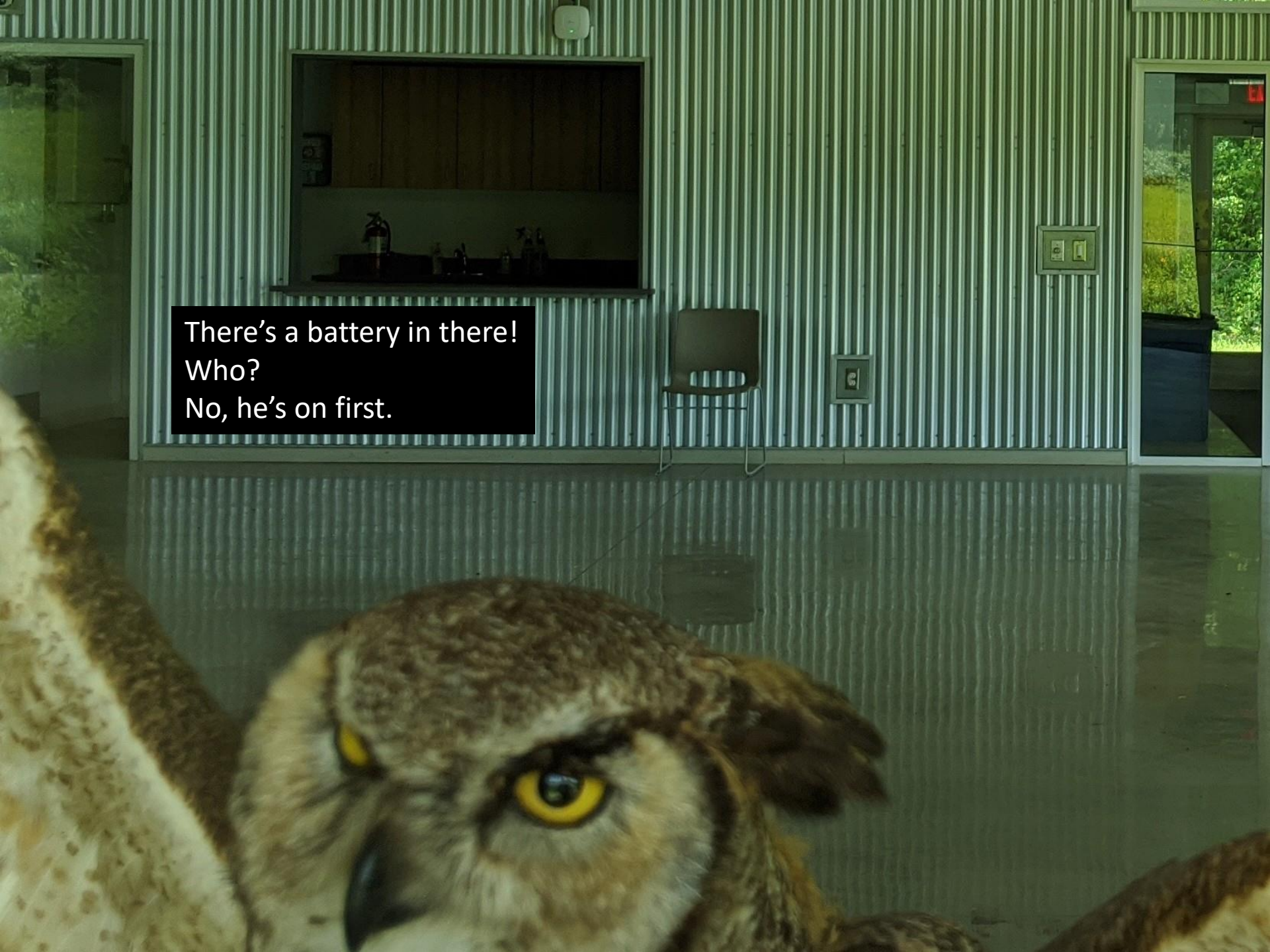




Drilling on a 450V battery...nah, you don't need to watch what you're doing.



Leftover parts....
I'm sure there's a broom and a rug around here somewhere.

A room with corrugated metal walls and a counter with a sink. A chair is in the center. A large owl is in the foreground.

There's a battery in there!
Who?
No, he's on first.

Online monitoring shows energy flow in real time

Energy today
25.46 kWh

Energy this month
652.64 kWh

Lifetime energy
23.57 MWh



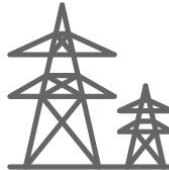
5.84 kW



0.71 kW



5.07 kW



100%

0.06 kW



Site Status



ID

605436

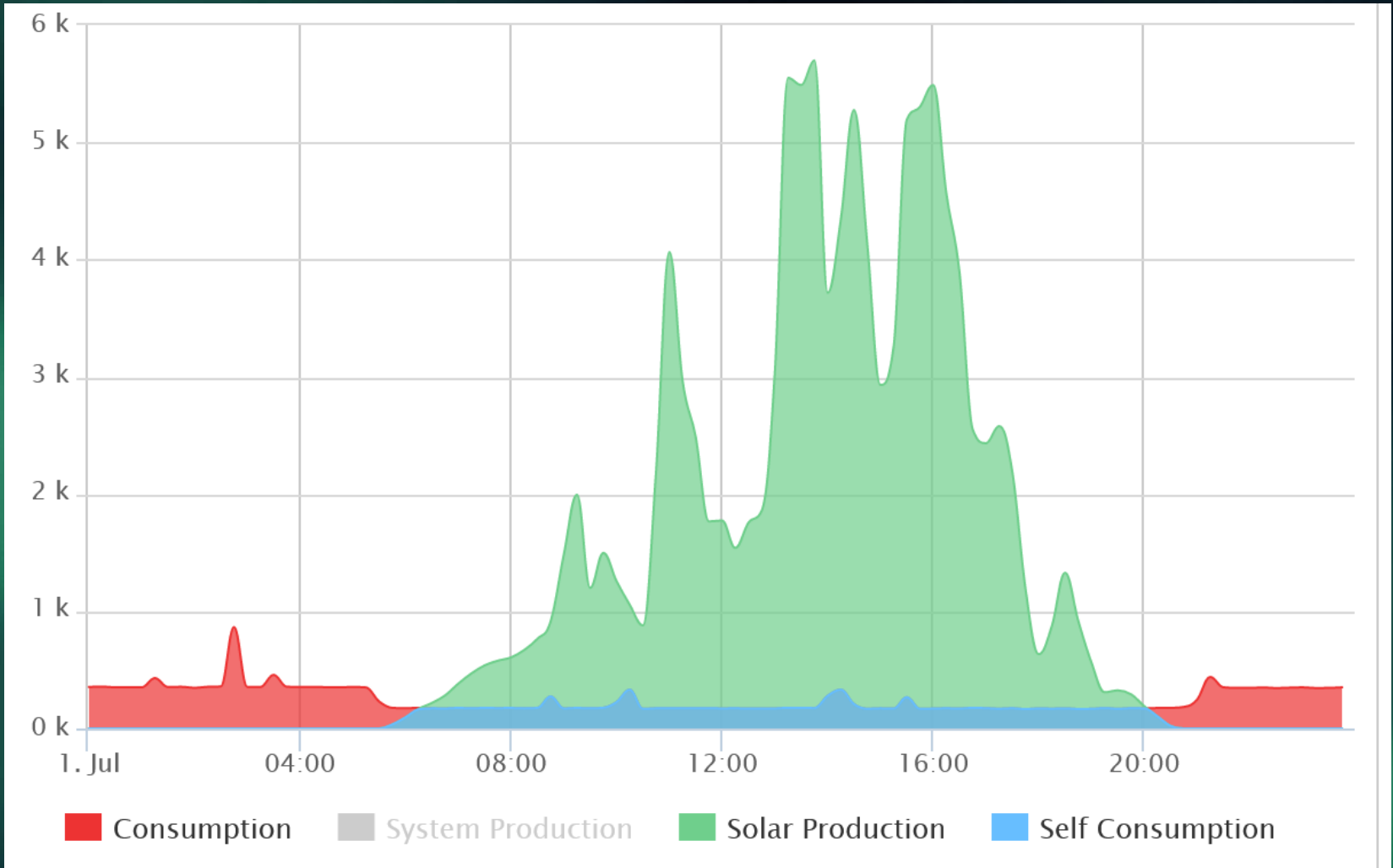
Name

Prairie House

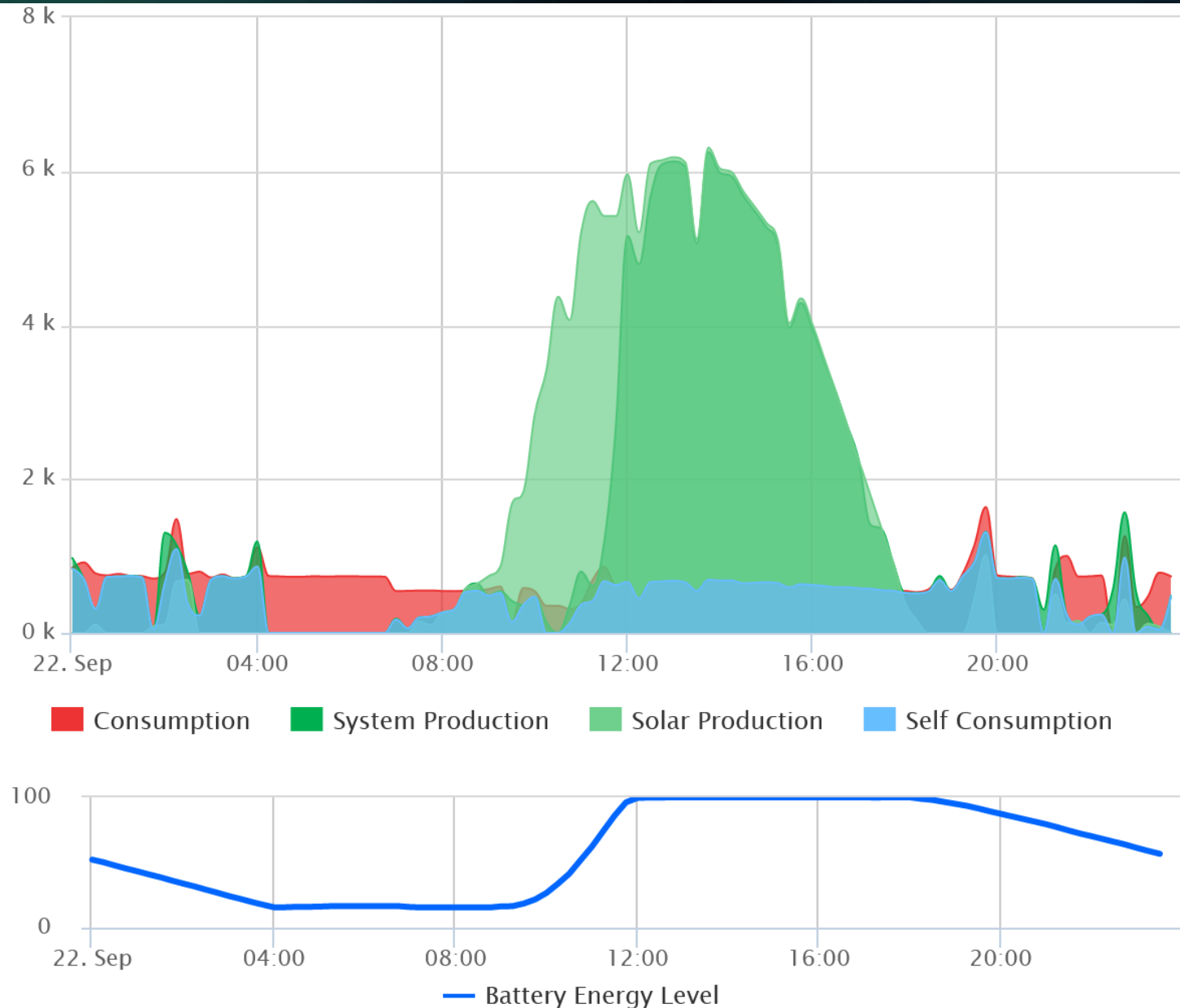
Address

Silver Creek Road Northeast ...
Rochester, Minnesota, United S...

Typical unoccupied day before battery 7/1/2020



Typical unoccupied day with battery 9/22/2020



Date:

[◀ Previous day](#) | [Next day ▶](#)

Before battery

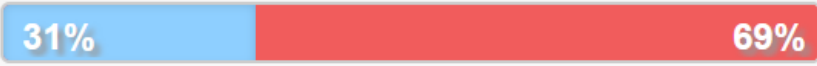
07/01/2020

System Production: **29.25 kWh**



Self-consumption: **1.59 kWh** Export: **27.66 kWh**

Consumption: **5.08 kWh**



Self-consumption: **1.59 kWh** Import: **3.49 kWh**
↳ **0 kWh from batteries (0%)**

After battery

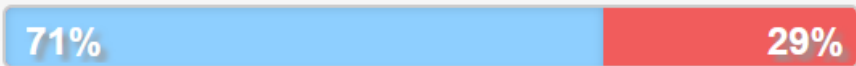
09/22/2020

System Production: **37.89 kWh**



Self-consumption: **12.06 kWh** Export: **25.83 kWh**

Consumption: **17.1 kWh**



Self-consumption: **12.06 kWh** Import: **5.04 kWh**
↳ **6.41 kWh from batteries (53.2%)**

Werner Electric, Cottage Grove, MN



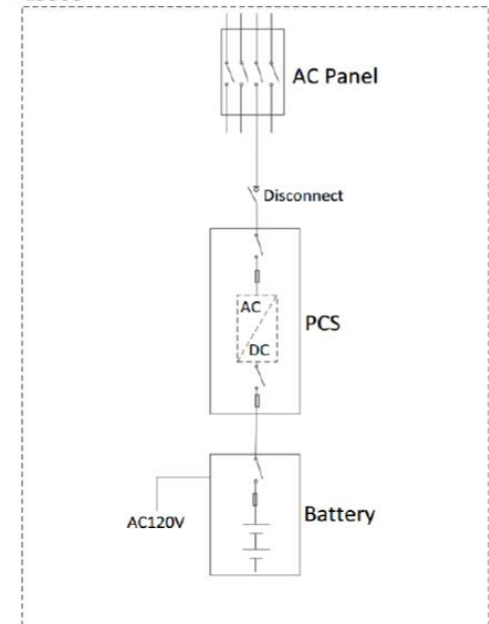
Werner Energy Storage



- Commercial & Industrial



L3060



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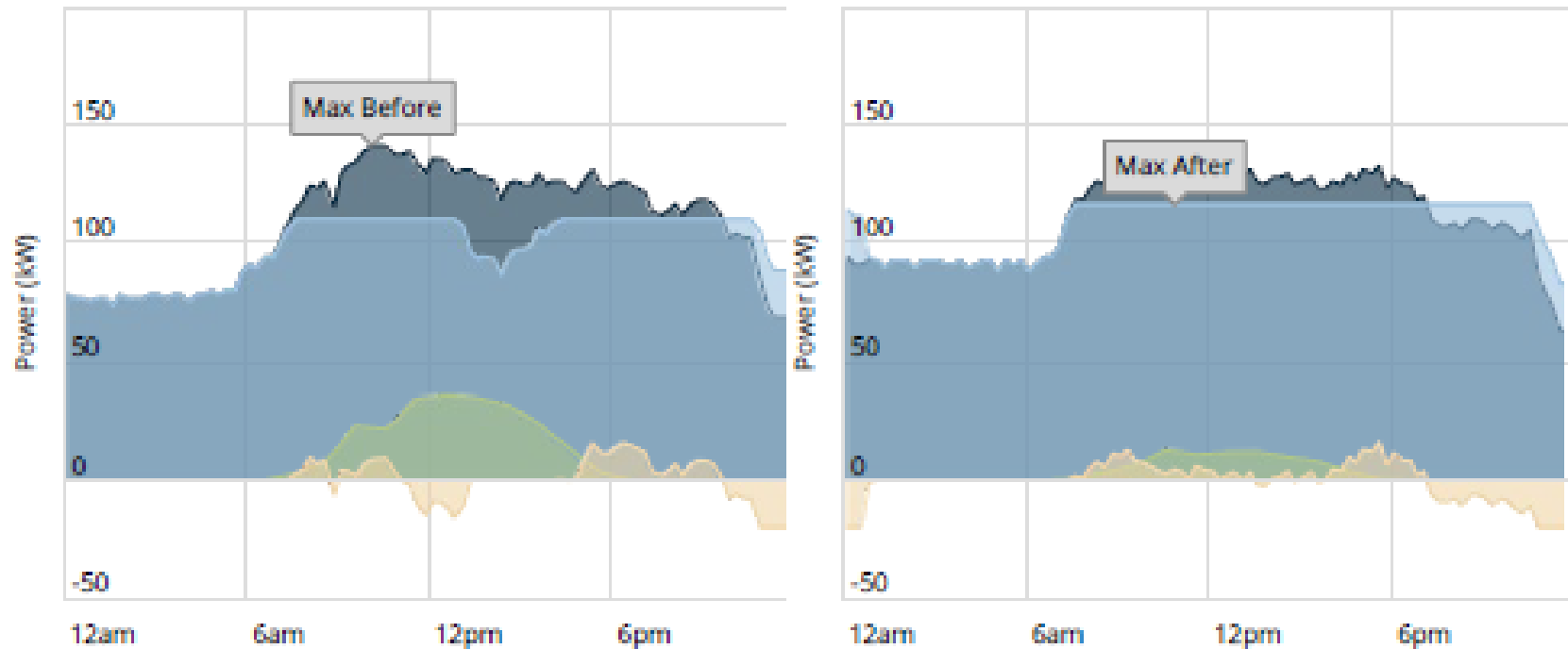
Demand Profiles

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

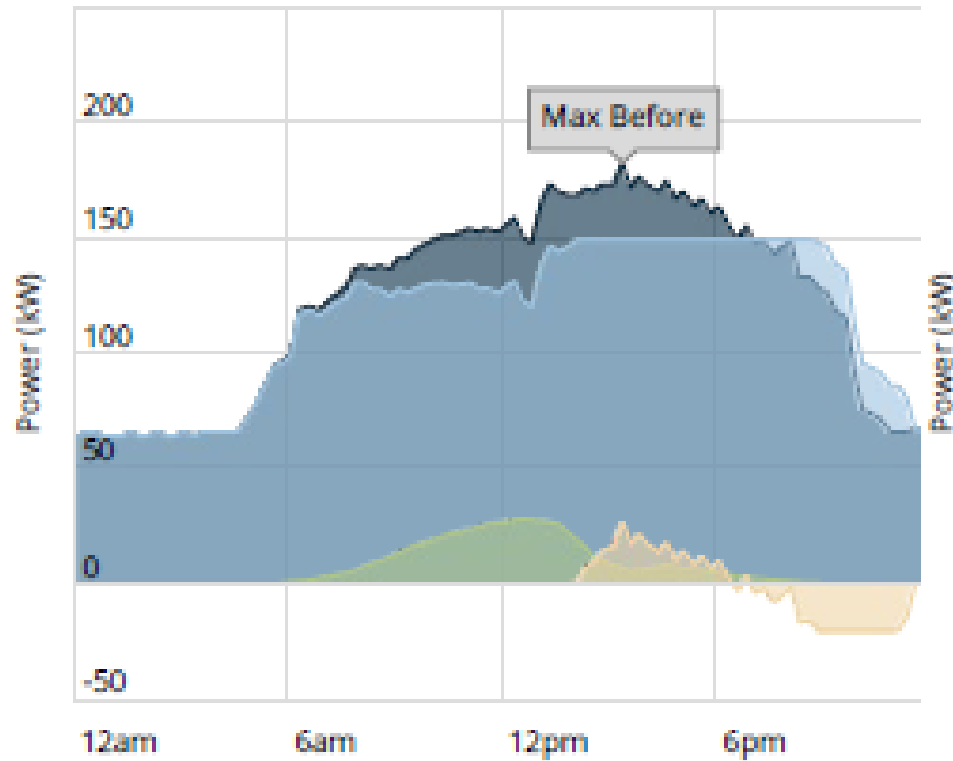
Max Demand After 2/15/19 10:45am



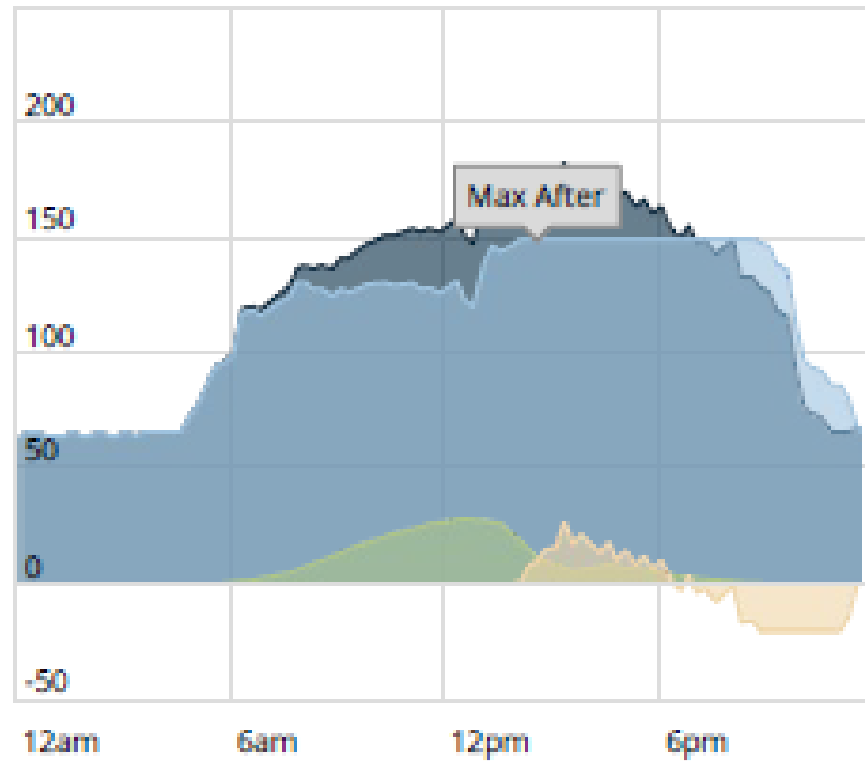
Legend: Demand Before Solar PV Energy Storage Demand After

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.

Max Demand Before 6/11/19 03:15pm



Max Demand After 6/11/19 02:30pm



Legend: Demand Before Solar PV Energy Storage Demand After



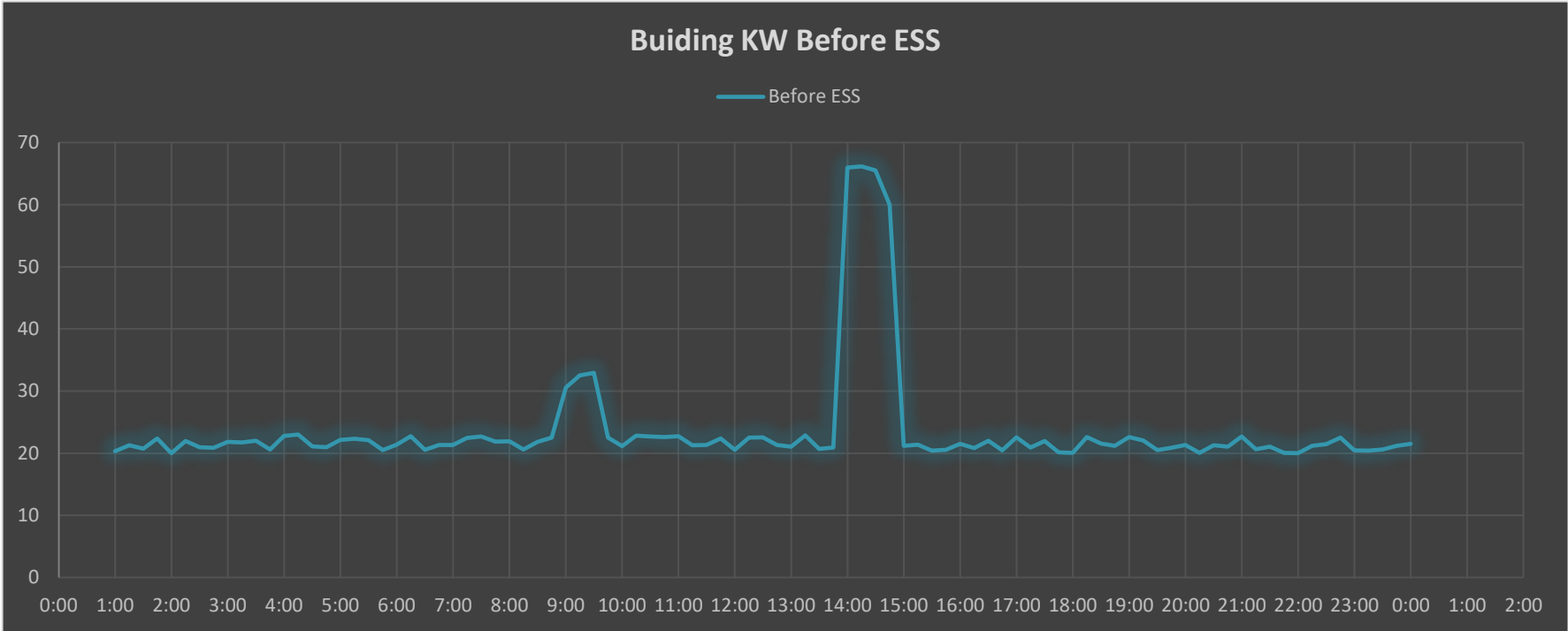
What is Demand Charge Management?

kW vs kWh

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?

