



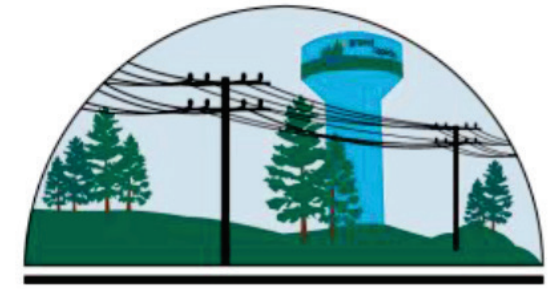
Grand Rapids Public Utilities Solar plus Battery Storage Project

**CERTs and Institute on the Environment:
Summer Community-Storage Workshop**

07/19/2021

Grand Rapids Public Utilities

- Julie Kennedy – General Manager
- Jeremy Goodell – Electric Department Manager
- Grand Rapids Public Utilities
 - Municipal utility located in Northern Minnesota
 - Services include electric, water, and wastewater
 - Electric service territory ~27 square miles
 - 7500 electric connections, 3250 water/sewer connections
 - 31 MW peak summer load, 27 MW peak winter load
 - 160,000 MWh annual sales



**GRAND RAPIDS
PUBLIC UTILITIES**
Service is Our Nature



Project Background (early years)

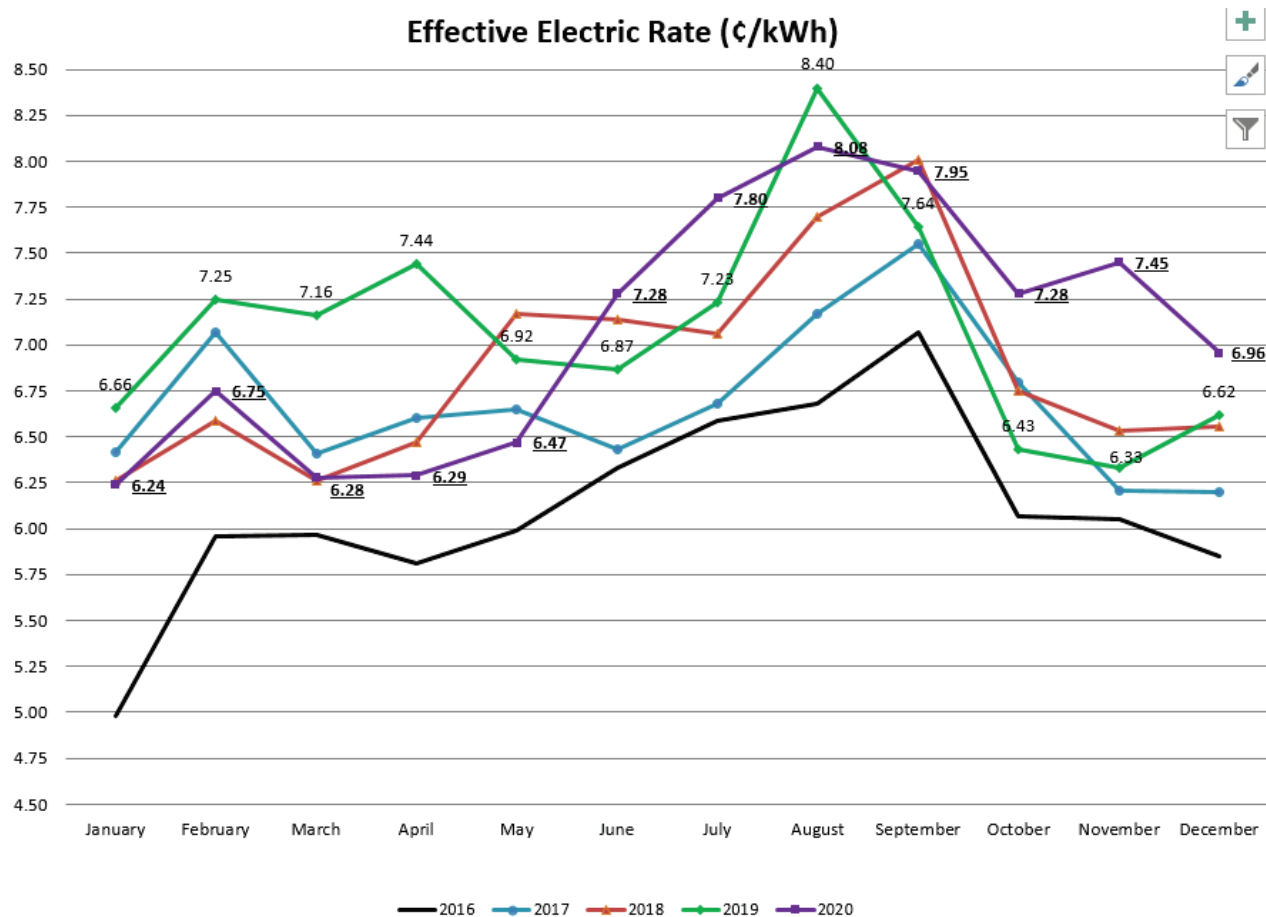
- 2016 - concept started as a community vision
Itasca Clean Energy Team – local advocacy group
Community solar garden model with subscriptions



- 2017 - GRPU – research/survey - Commission approval required at major steps
Project must not be subsidized by the utility’s general electric revenue
- 2018 - consultant Jill Cliburn & Associates - prepare a program analysis
Difficult to make the subscription model work out financially
Economics that caused us to look at adding the battery storage concept

Solar + Battery Storage Economics

- Average solar cost from RFI were ~\$0.07/kWh
- Average wholesale power costs were ~\$0.076/kWh

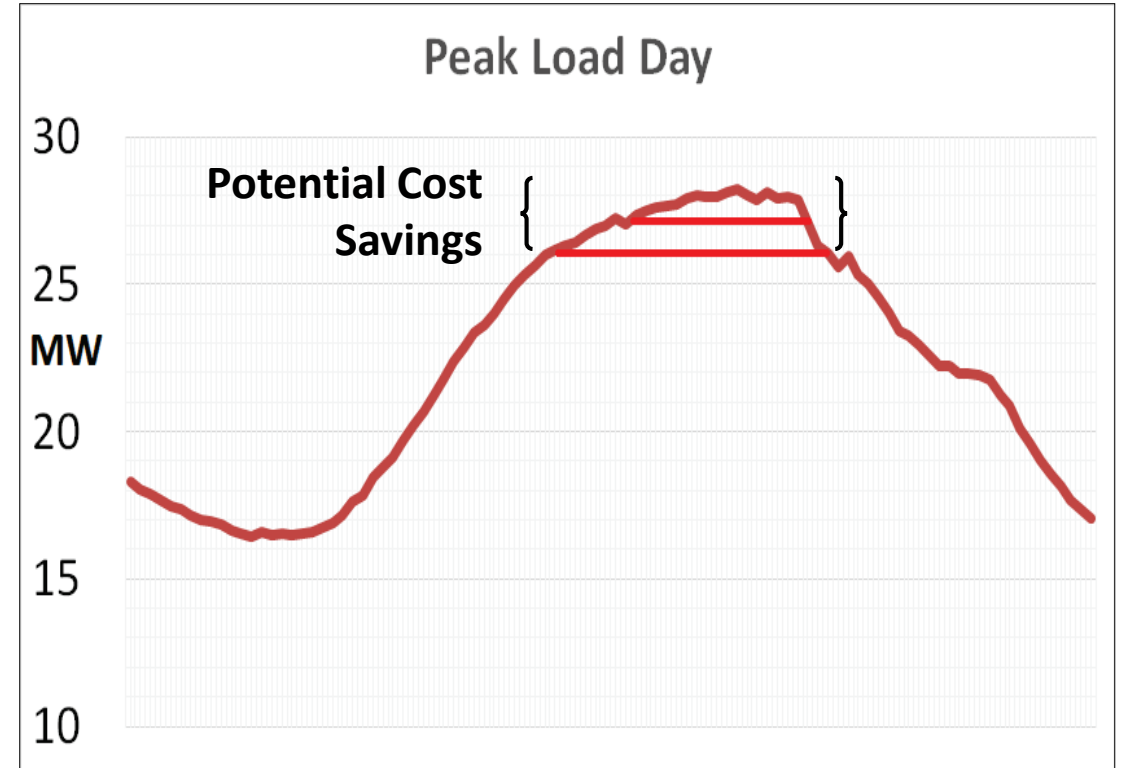


Demand Rate = \$19.48/kW-month
Energy Rate = \$0.02616/kWh

Leverage savings from reducing the peak demand – could reduce cost of the overall project

Battery Storage Demand Savings

- Solar peak around 1 to 2 pm
- ~4 hr system peak around 4:30 pm
- Determine battery storage system to be charged by the solar array and then dispatched to “shave” the peaks
- GRPU’s wholesale power bill from MP can be reduced approximately \$19,000 per month for every megawatt (MW) of demand that can be “shaved”



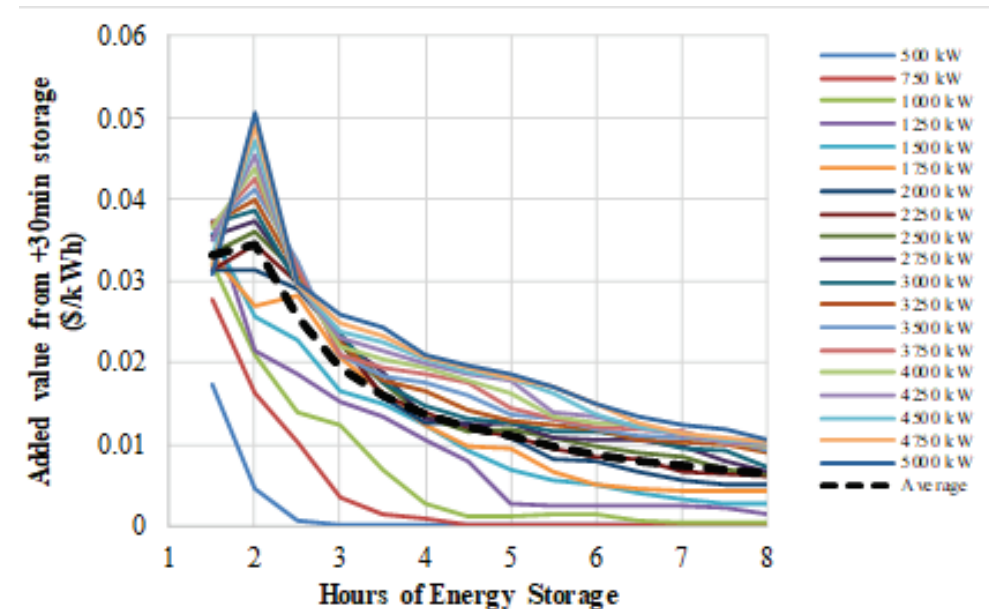
Project Team Expands

- Dec 2018 - MP joined GRPU on the Project MP contract - GRPU can't purchase from others

- 2019 - Request for Proposals (RFP)

Evaluation team to look at vendors, sites, solar array sizes, and battery sizes

Match best site with the lowest vendor price with right sized solar array that could charge the best sized battery to shave the most GRPU peak



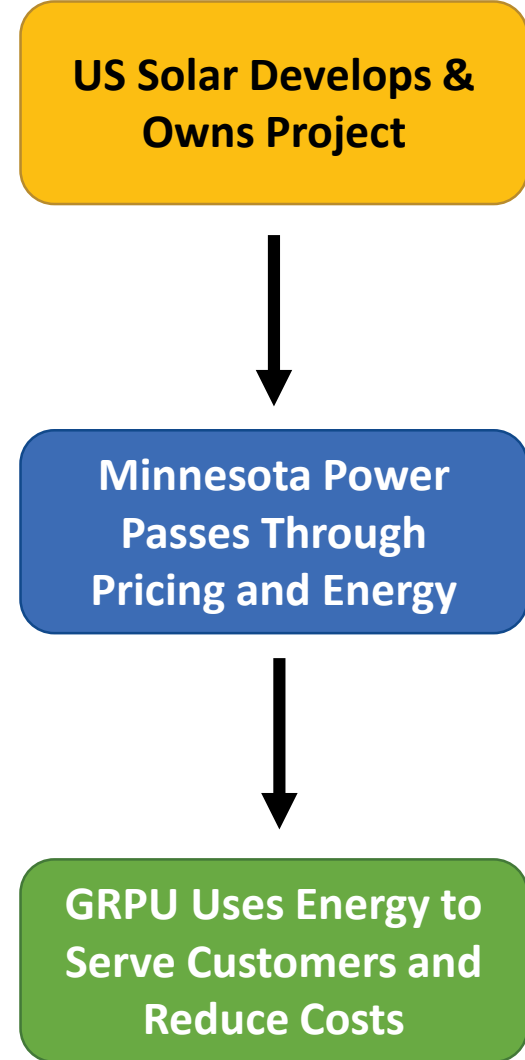
Project / Developer Selection

- 2020 - US Solar selected as the Developer
- Site - 15.5 acres of City/airport property
- Solar - 2 MW AC array with single-axis tracking
- Combination of Jinko panels and Heliene bi-facial panels
- 1 MW AC – 2.5 hr Ziegler lithium ion battery storage system
- Pollinator-friendly vegetation for ground cover
- On-line public-facing educational portal showing energy production
- Economic analysis shows GRPU can save \$50,000 to \$100,000 per year in wholesale power costs if we optimize the peak shaving



Contracts / Agreements

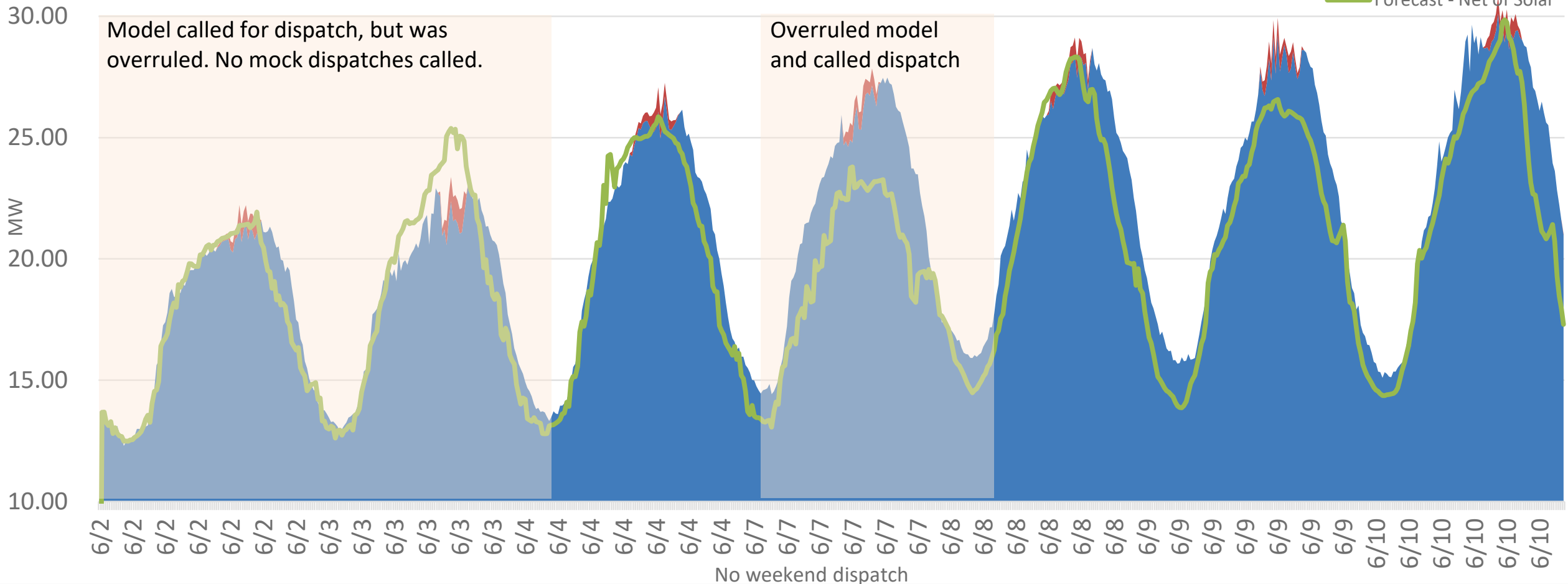
- US Solar is investing capital to develop and build the Project and is responsible for operation and maintenance of system for duration of agreement
- MP is buying the solar energy produced and the rights to the battery storage system from US Solar through a 25-year Power Purchase Agreement (PPA)
- GRPU then buys the solar energy and battery storage rights from MP at their cost
- MP and GRPU are working together to optimize the dispatch of the battery storage system to save energy during peak load times



Battery Dispatch Modeling

GRPU LMO Performance 6/2-6/10

- Fcst_Dispatch
- Net_Load
- Forecast - Net of Solar



Project will be “plugged in” in October 2021....

Itasca Clean Energy Solar Plus Battery Storage Project

Fall 2020
Site Preparation Begins

2021 Construction
Winter / Spring / Summer

Fall 2021
Energization and
Ground Cover



- First Solar *plus* Energy Storage Project in Northern Minnesota
- 2 Megawatt Solar Array (350 homes)
- Native Pollinator Habitat
- Locally Sourced, Sustainable, Renewable Energy

