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
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 GGRP 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
Model called for dispatch, but was overruled. No mock dispatches called.

Overruled model and called dispatch
Project will be “plugged in” in October 2021.

Itasca Clean Energy Solar Plus Battery Storage Project

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