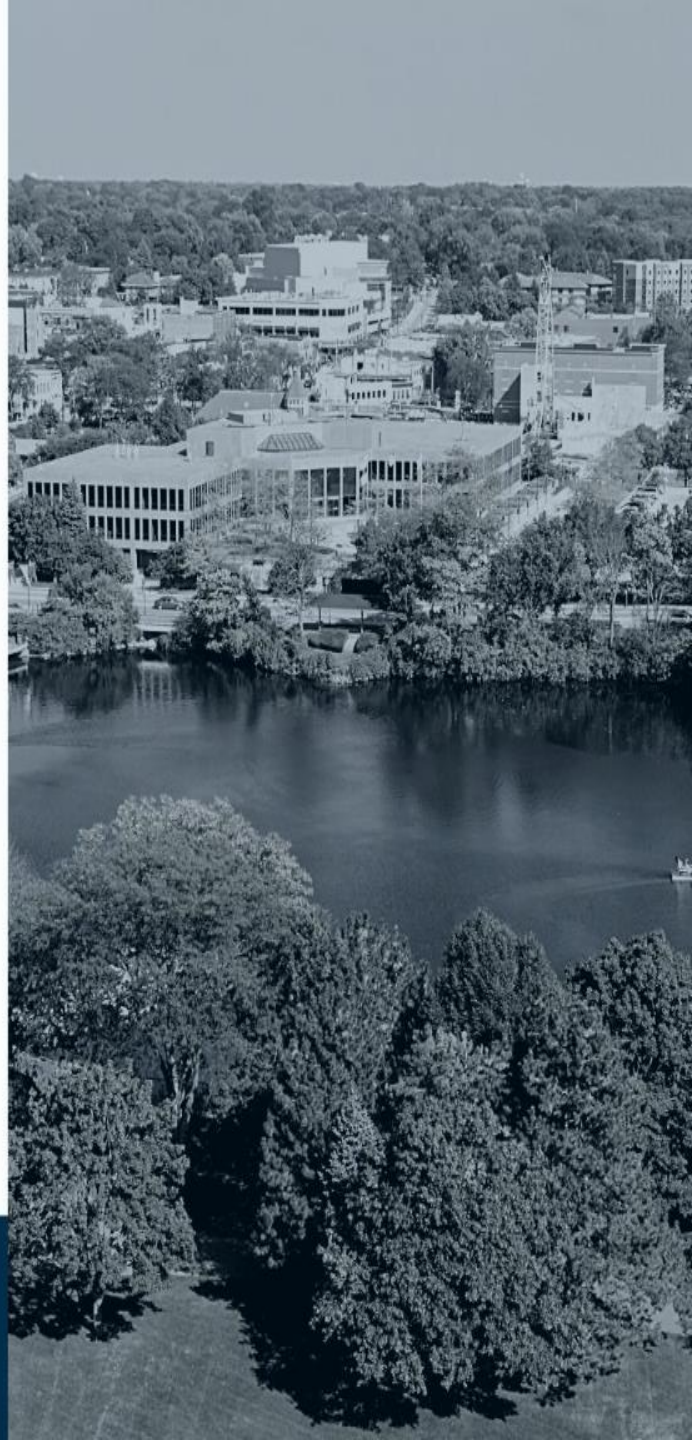
Distributed Energy Resource Management System (DERMS)

Naperville



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What is DERMS?

IEEE STD 2030.11-2021:

An application platform designed to manage device information, monitor and enable optimization and control of distributed energy resources (DER) and demand response (DR). A DERMS must be able to aggregate, simplify, optimize, and translate DER and DR functionalities. The DERMS enables the implementation of system services to the grid.

DR on Naperville Grid

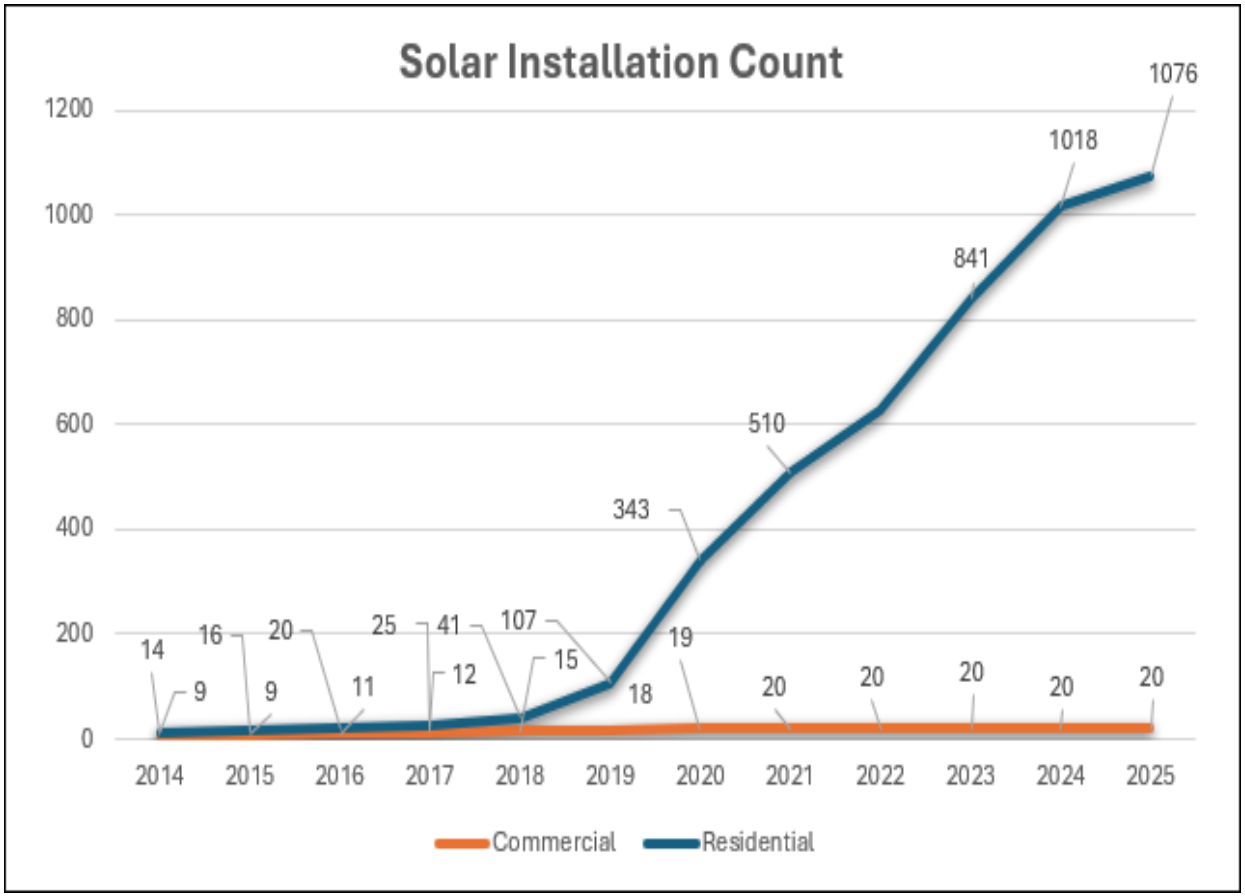
Conservation Voltage Reduction (CVR)

- CVR is the intentional operation of the substation transformer load tap changers to provide system voltages on the lower end of the acceptable range in order to achieve energy efficiency and demand reduction.
- Initiated CVR program in 2015, fully implemented in 2016.
- Operates 24x7x365 to provide transparent energy efficiency. Utility enables DR mode to further shave peak demand during monthly and PJM peaks.
- Average Monthly Energy Savings = 2,083,421 kWh ($103,643.19)
- Average Monthly Demand Savings = 3,345 kW ($59,236.78)

IMEA/Naperville DR Program

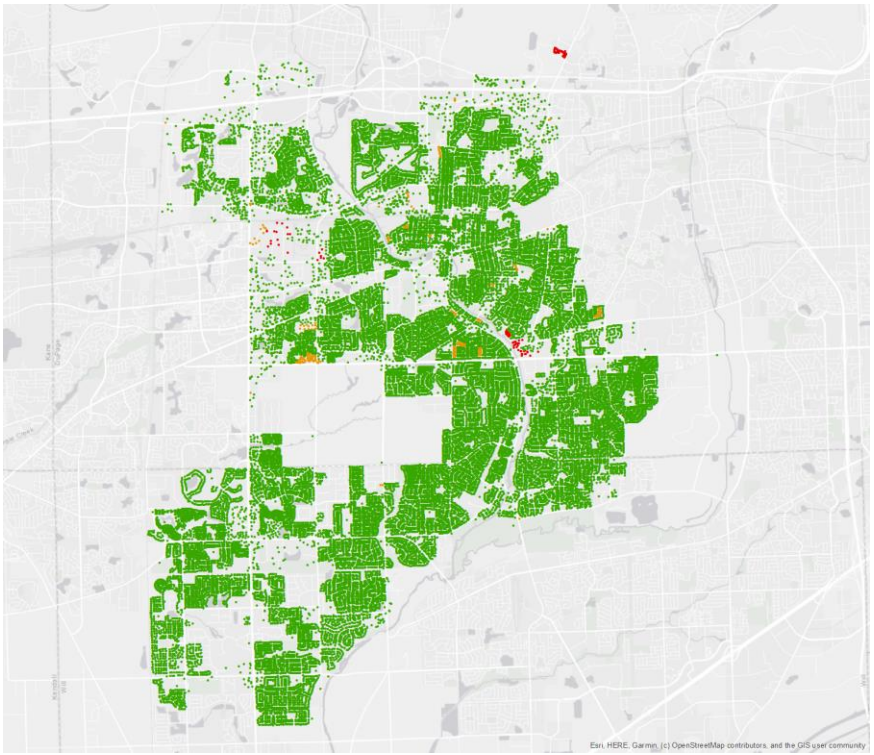
- IMEA offers an incentive to large utility customers who can shift load during times of peak system load.
- Started with City of Naperville in 2021 with 5 customers.
- Currently have 1 customer signed up (Springbrook Water Reclamation Center).
- Shave about 500kVA of peak demand

DER on Naperville Grid

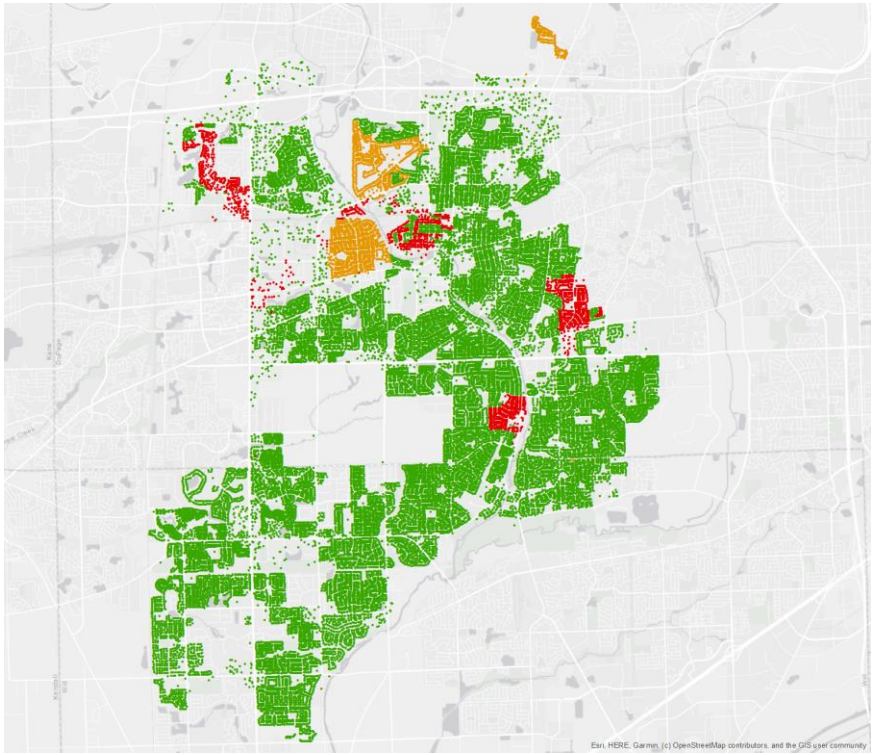


DER Impact on Naperville Grid

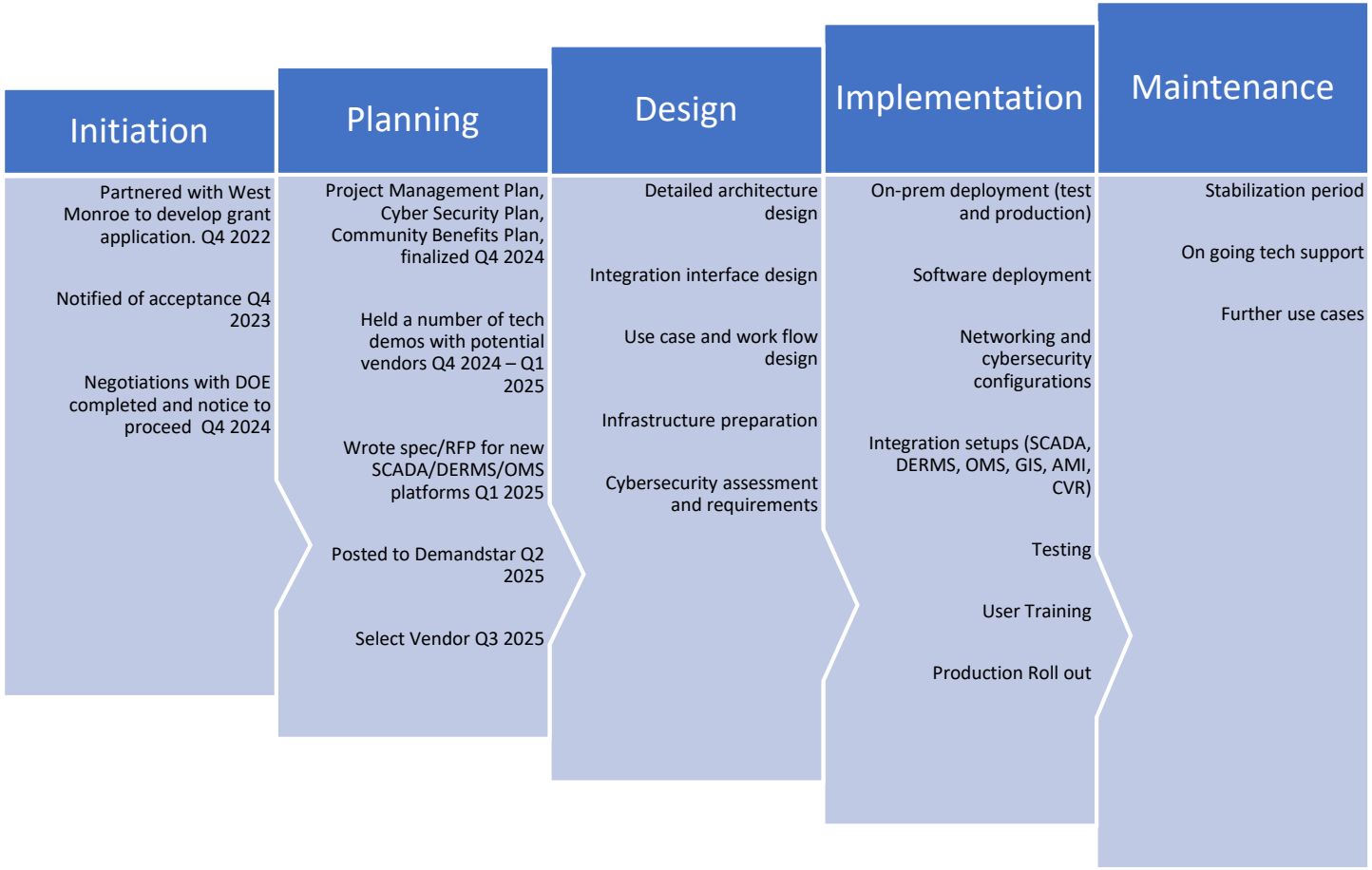
2023 Hosting Capacity Map



2025 Hosting Capacity Map



DERMS Project Road Map



DERMS Program Road Map

Initial Implementation

- DER modeling/forecasting
- Visualization
- Real-time modeling and estimation
- CVR integration

Near term

- Pilot programs for:
  - Residential Demand response (thermostat)
  - Residential battery peak shave
  - EV chargers as a grid storage asset

Long term

- Evaluate pilot programs against goals and objectives to determine which to further expand and which to end
- Continuously look for opportunities to optimize grid operations

Cybersecurity

- Cybersecurity plan submittal to Department of Energy expected in June
- Implementation of cybersecurity plan following well established and trusted practices.
- Continuous evolution of the program as threat landscape in industry changes and the utility is required to adapt.

Questions?