

# Wind in the Mix:

Integrating Distributed Wind into Microgrid Modeling



Distributed Wind 2026

*February 23-25*

*Arlington, VA*

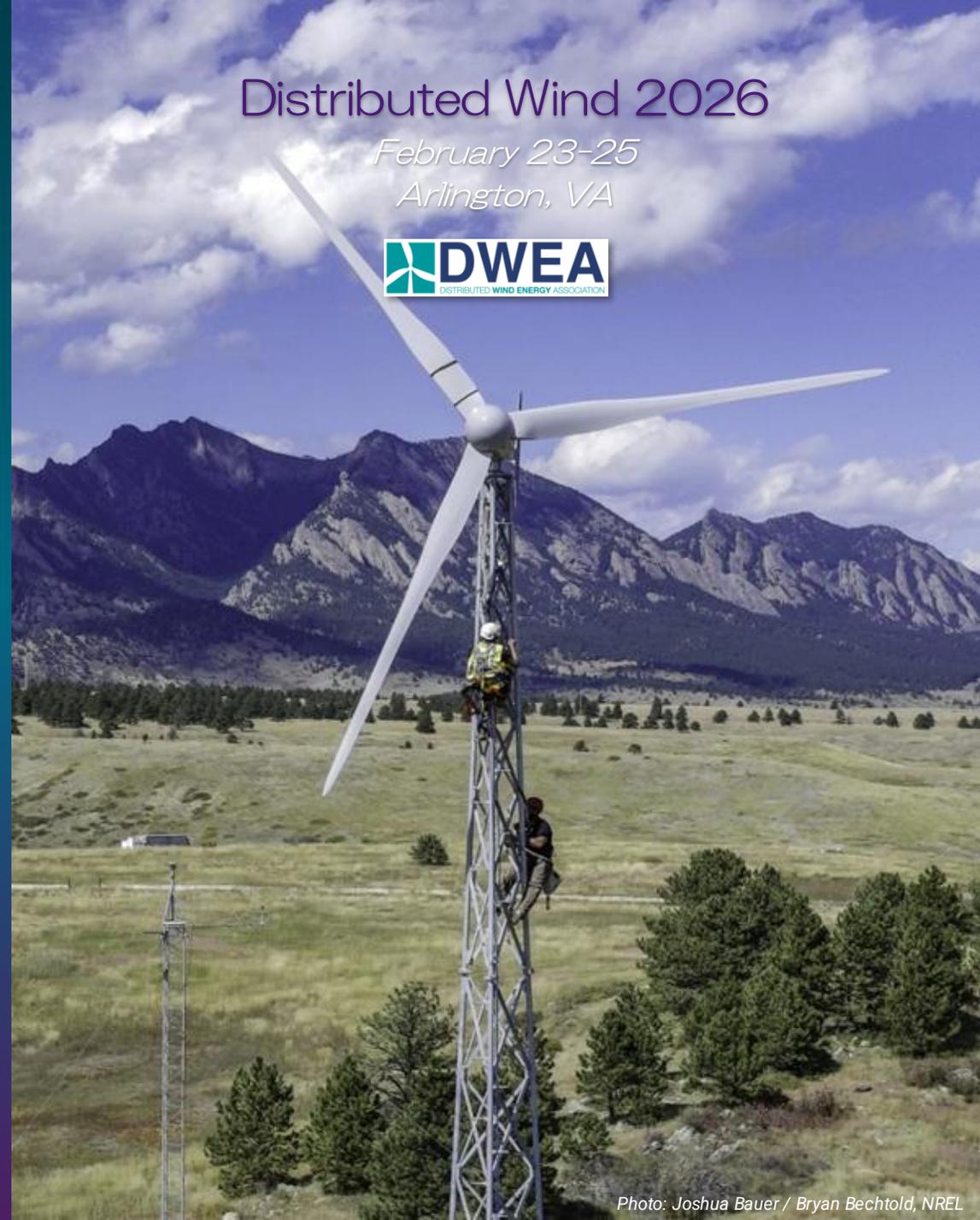


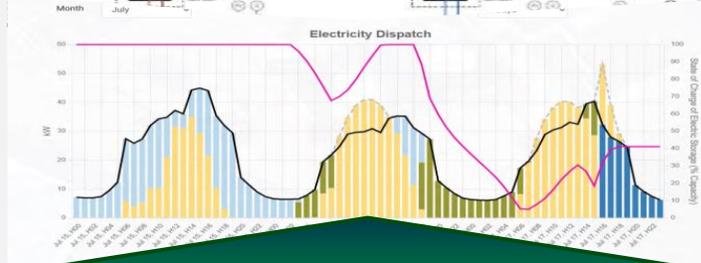
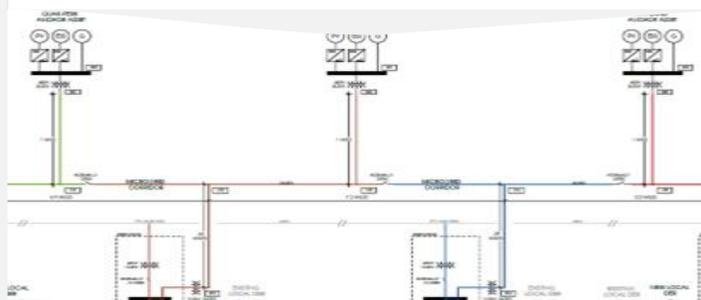
Photo: Joshua Bauer / Bryan Bechtold, NREL

## Educate



Curriculum, Train the Trainer, XR Development, LMS, Labs

## Develop



Planning, Analysis, Budgeting, Modeling, Simulation, Design

## Implement

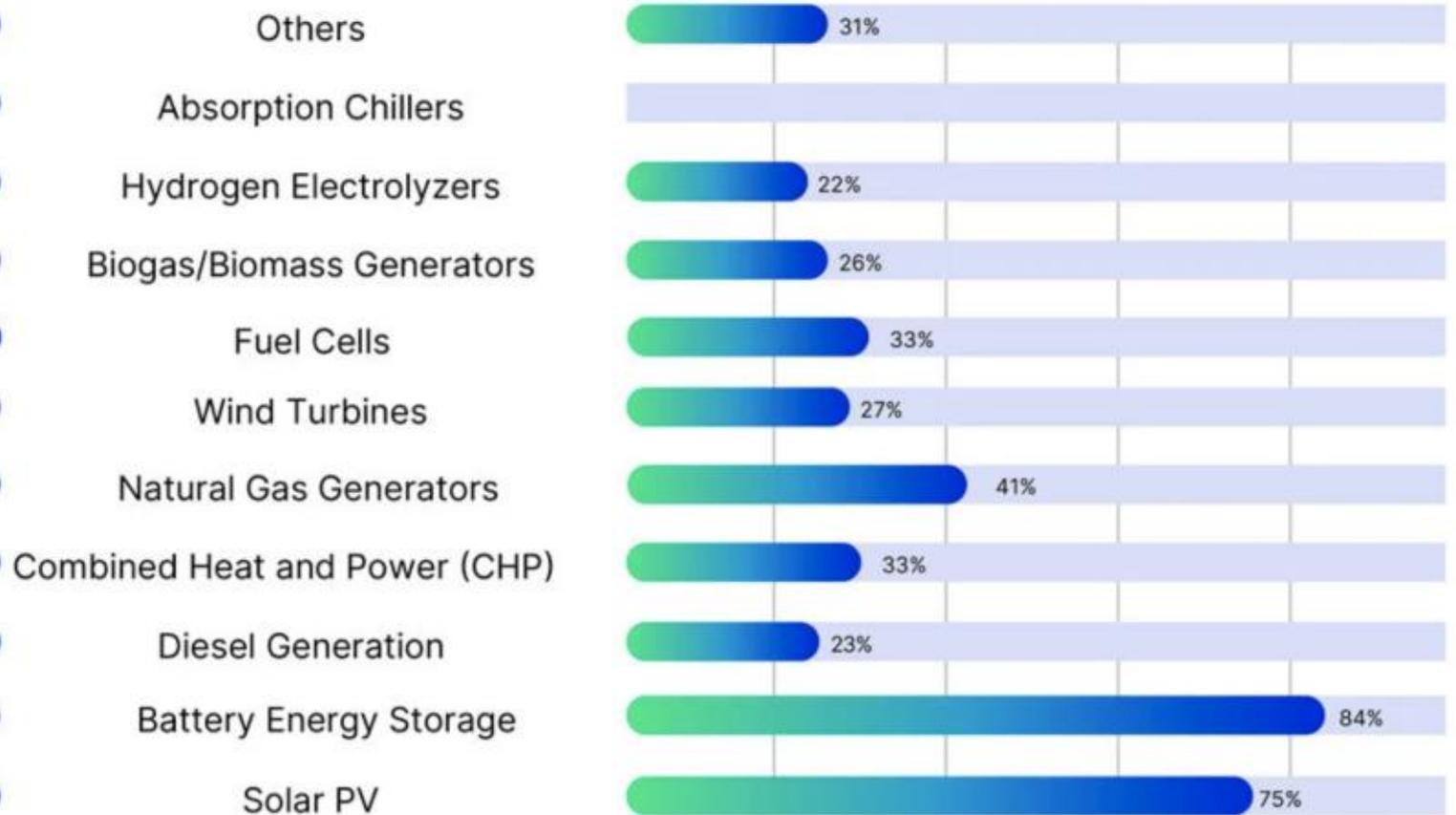


RFP, Owners Rep, Auditing, Commissioning, Conflict Resolution

Which assets have you or your partners deployed in your energy projects to date?



Which of the following assets do you expect to use in projects over the next 3-5 years?



## Baseline Microgrid

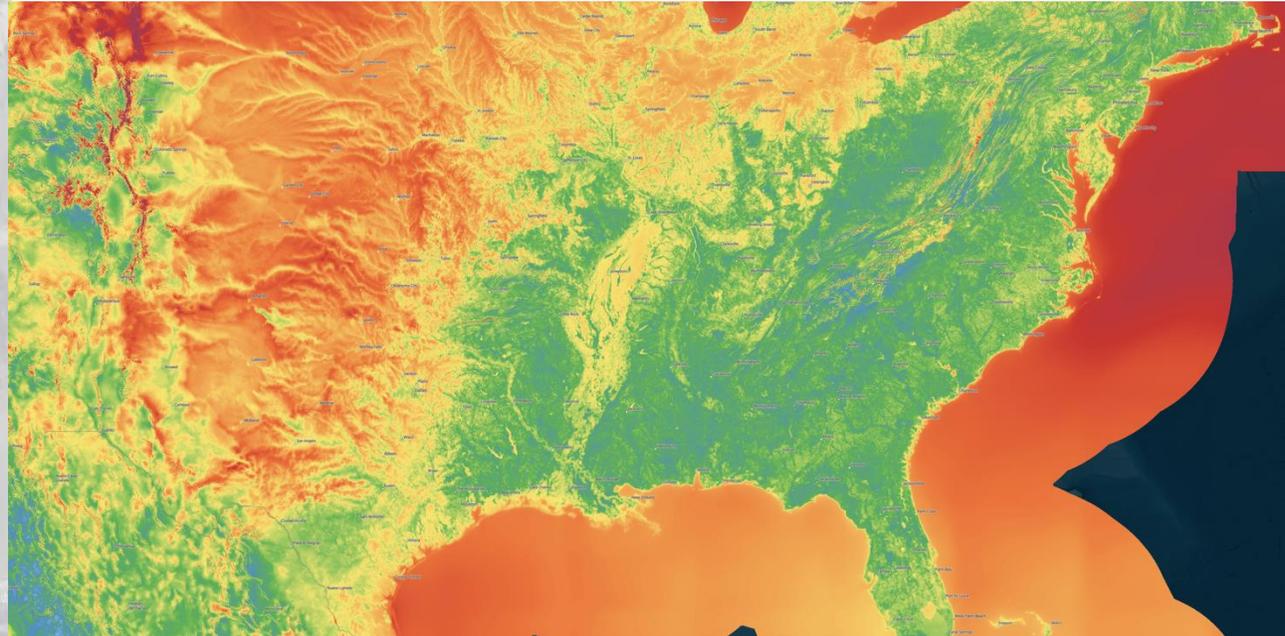
- 1.581 GWh/year load
- 511.7 kW peak (winter)

## Components

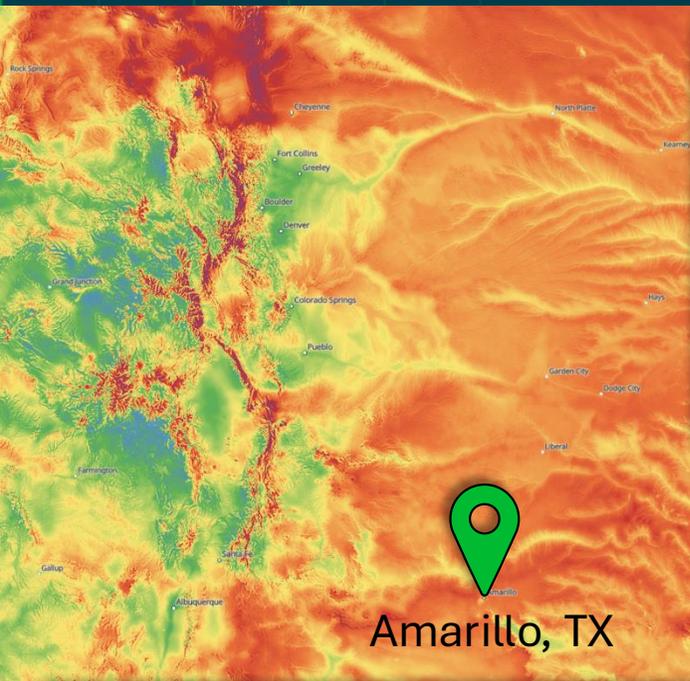
- Roof & Carport PV
- BESS
- Backup generator

## 90kW Eocycle Turbine

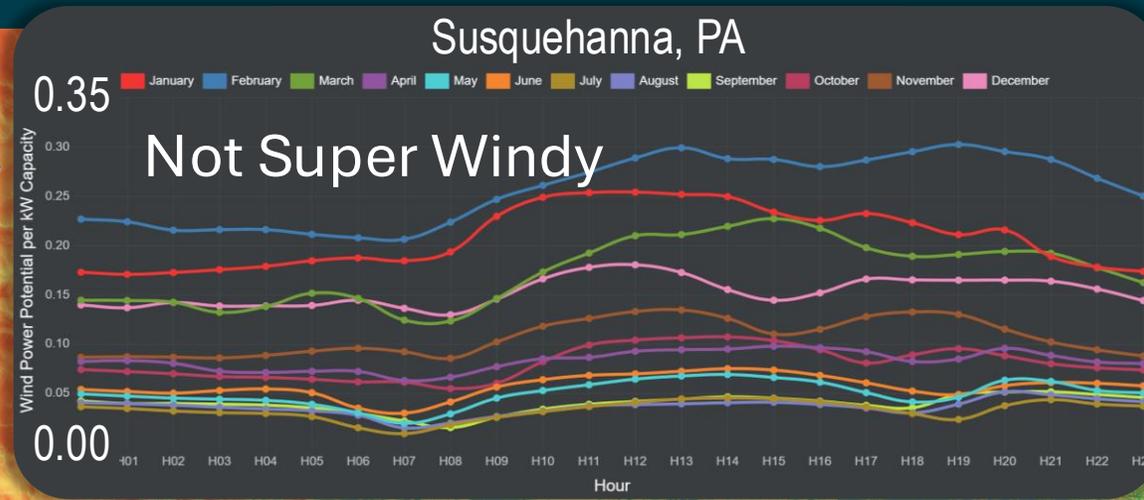
- 125' Hub height
- Wind resources modeled per location



# Modeled Locations – Wind Resource

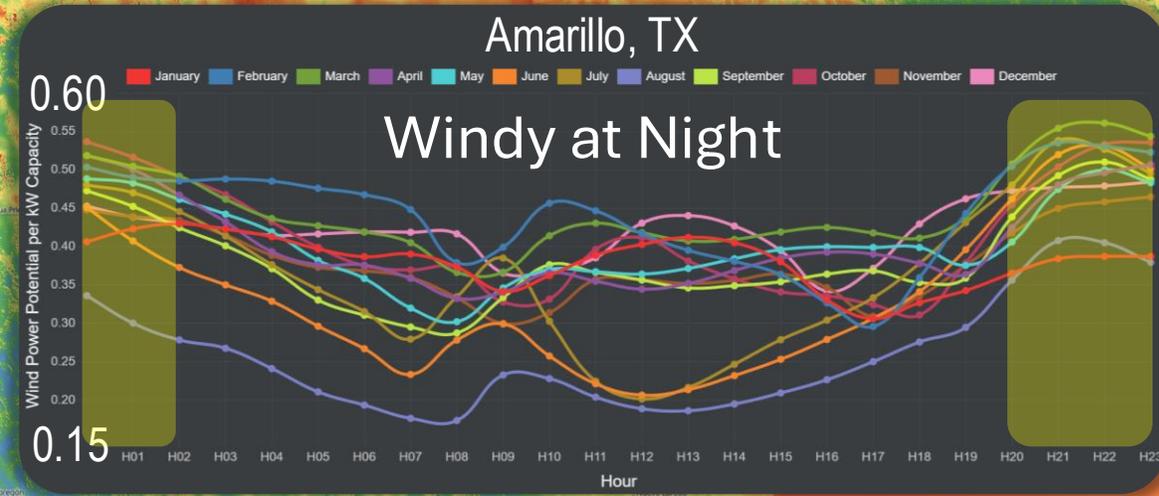
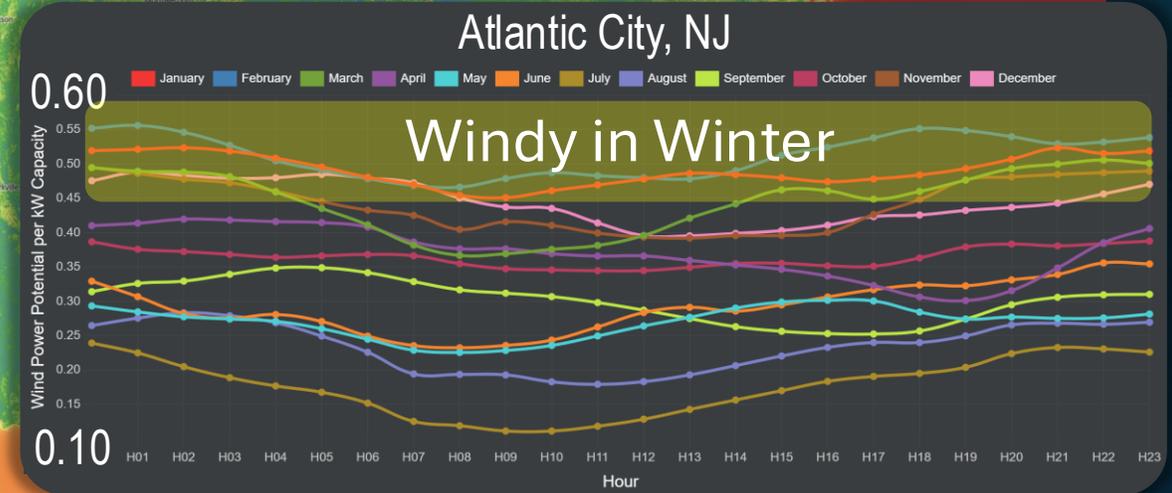


Amarillo, TX



Susquehanna, PA

Atlantic City, NJ



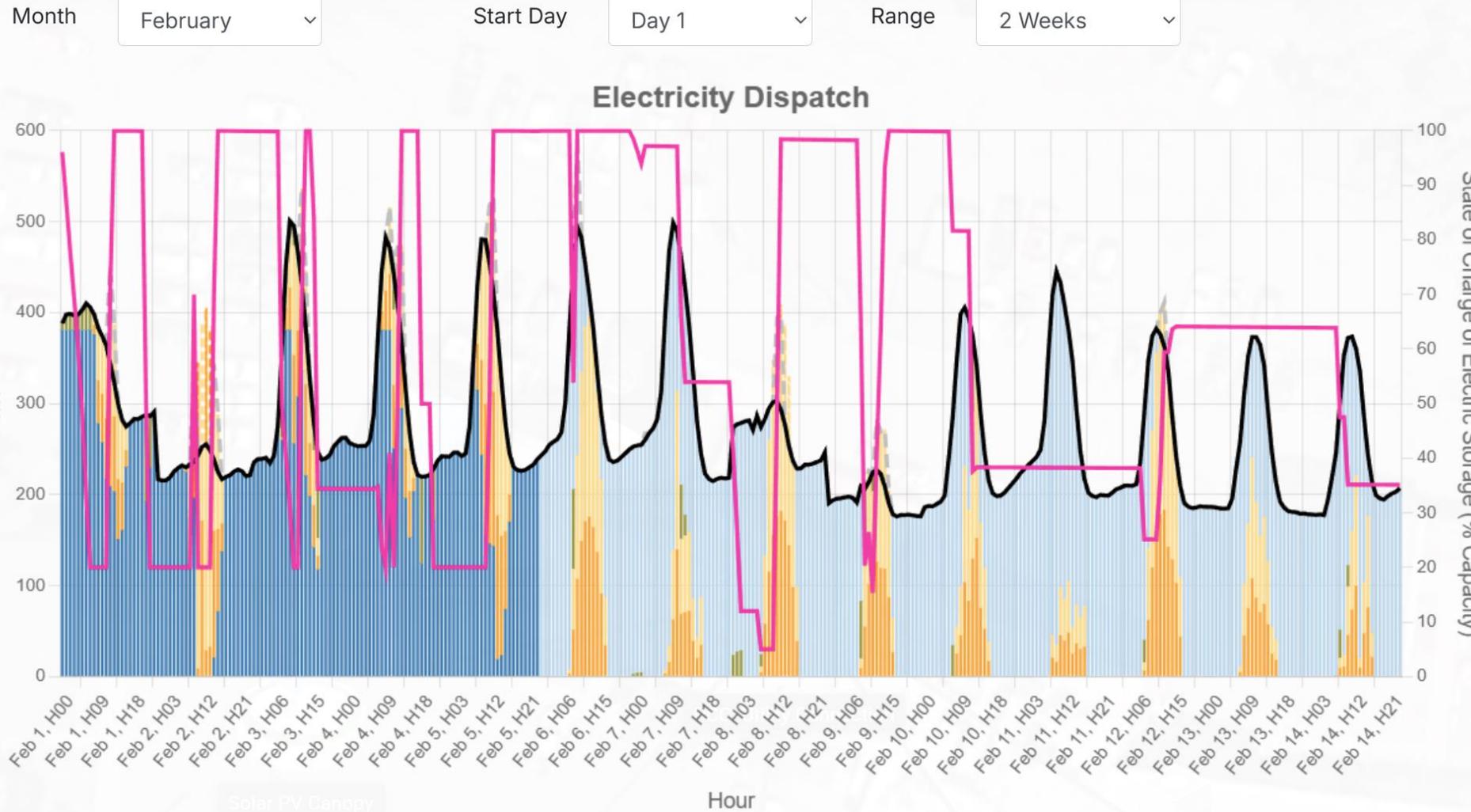
## Results

- Dozens of Simulations Run
- Wind was NEVER an economic option

Type	Total New Capacity	Technology (New Capacity)
	850 kW	Solar PV Canopy (500 kW)
		Solar PV Roof (350 kW)
	100 kWh	Battery Energy Storage System (100 kWh) (1 unit)
	250 kW	Diesel Generator (250 kW) (1 unit)

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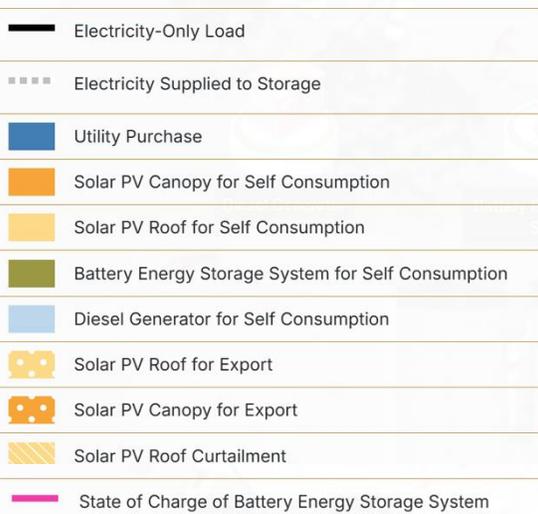
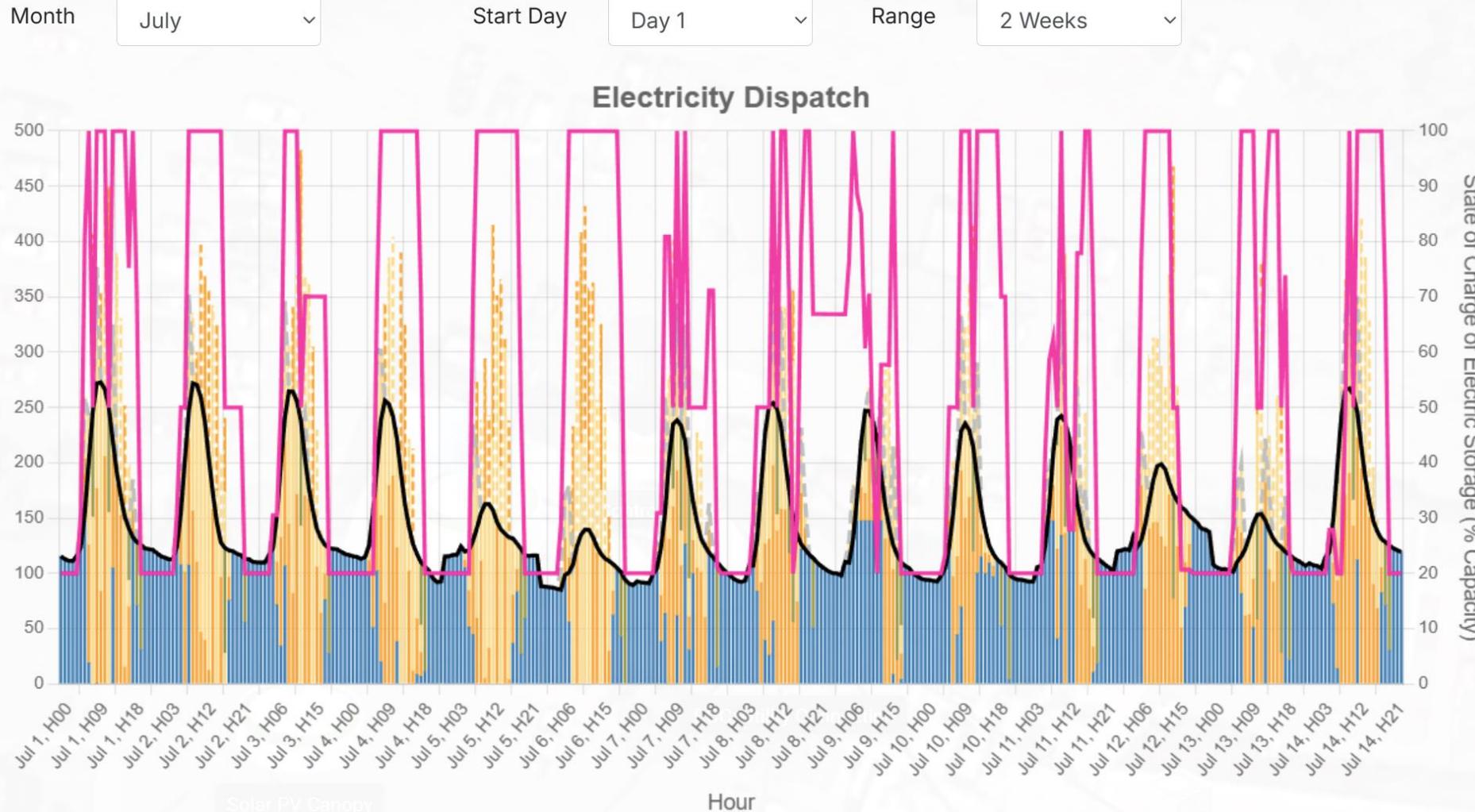


Solar PV Canopy

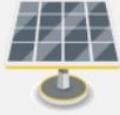
Hour

## Results

- BESS Cycles
- Demand Reduction



## Results

Type	Total New Capacity	Technology (New Capacity)
	438.5 kW	Solar PV Canopy (88.5 kW)
		Solar PV Roof (350 kW)
	500 kWh	Battery Energy Storage System (500 kWh) (5 units)
	250 kW	Diesel Generator (250 kW) (1 unit)
	270 kW	Wind Turbine (270 kW) (3 units)

- Prefers cost effective PV
- BESS for smoothing
- As much wind as possible to meet annual load total

## Results

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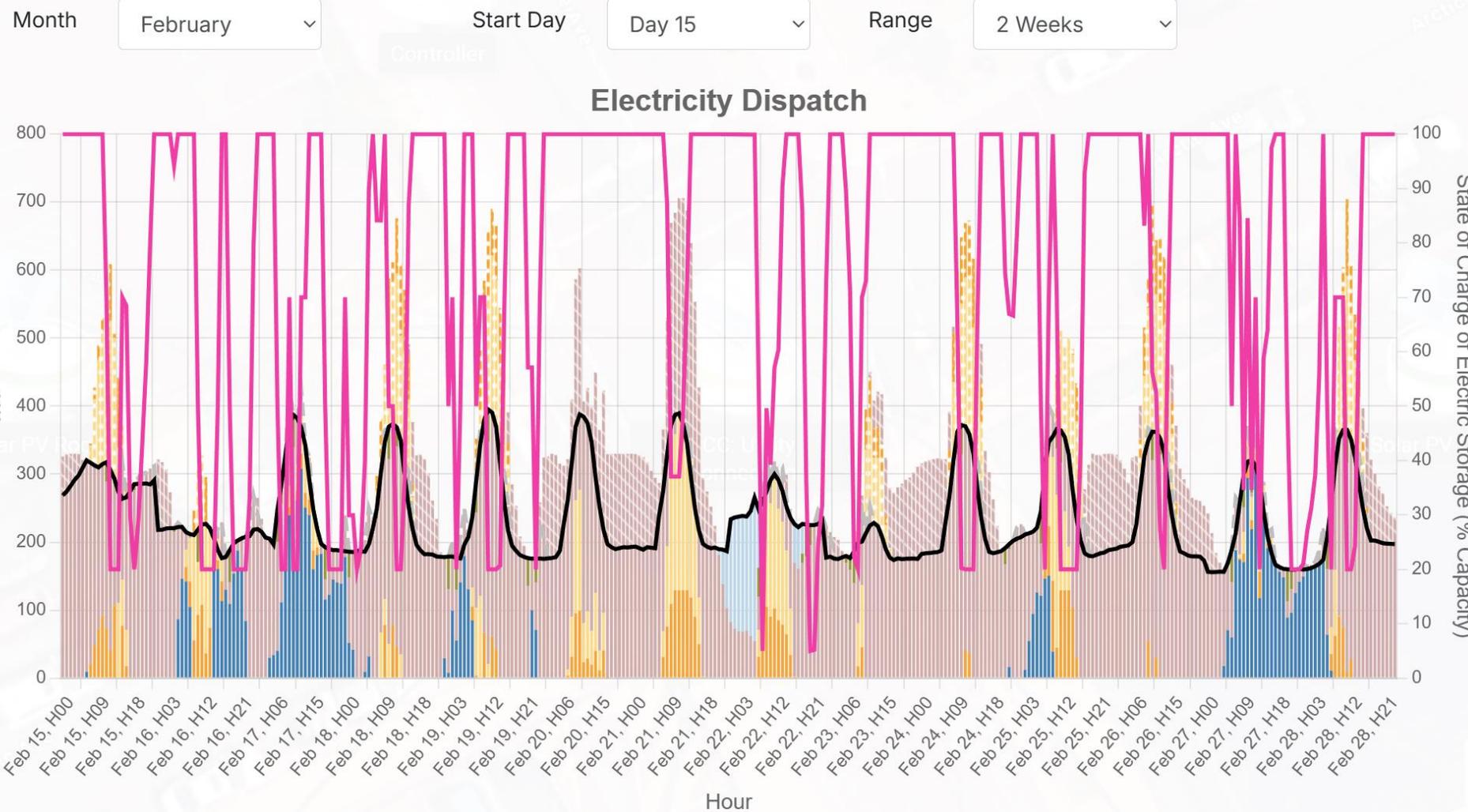
## Results

- Prefers cost effective PV
- Uses more wind due to export value of energy
- BESS and genset still required

Type	Total New Capacity	Technology (New Capacity)
	505 kW	Solar PV Canopy (155 kW)
		Solar PV Roof (350 kW)
	100 kWh	Battery Energy Storage System (100 kWh) (1 unit)
	250 kW	Diesel Generator (250 kW) (1 unit)
	360 kW	Wind Turbine (360 kW) (4 units)

## Results

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State of Charge of Electric Storage (% Capacity)

## Wind Earns its spot – in the right condition,

Amarillo and Atlantic City both selected 270–360 kW of wind. Susquehanna selected none. Resource quality is the gatekeeper.

## Wind complements solar — it doesn't compete with it.

Every optimized system still selected solar PV as the primary asset. Wind's value is filling the overnight and winter gaps that solar can't reach.

## Storage and backup are still non-negotiable.

BESS and generators were required in every scenario — even with 360 kW of wind. Temporal diversity reduces dependence, it doesn't eliminate it.

## For the Wind Industry

- The microgrid market is actively looking for new DER options. Wind belongs in the optimization — and when resource and economics align, the optimizer selects it. The opportunity is helping developers identify where those conditions exist.

# Get Started Today



A screenshot of the ProtoGen website's "Our Tools" page. The page has a green header with the ProtoGen logo and navigation links: Home, Tools, Services, Education, Case Studies, About Us, Blog, and Contact. The main content area is titled "Our Tools" and includes a sub-section for "Microgrid Navigator (MNav)". This section features a grid of three cards: "Your Project's First Step", "Advanced Data Analysis", and "Ease of Scalability". Each card contains a small image and a brief description. At the bottom of the MNav section are two buttons: "Learn More" and "Go To MNav".

A screenshot of the ProtoGen Microgrid Navigator (MNav) tool interface. The page is titled "Getting Started with Microgrid Navigator (MNav)". It includes a paragraph explaining that MNav is a starting point for designing a microgrid based on location, electricity consumption, utility tariff, and on-site solar potential. Below this is an illustration of a person standing next to a solar panel array, with a globe and a lightbulb icon above them. The interface also features a form with several input fields: "Address" (text input), "Utility Cost Input" (dropdown menu), "Building Type" (dropdown menu), "Critical Load Fraction" (slider set to 100%), "Historical Usage Input" (radio buttons for Annual, Monthly, and Upload CSV), and "PV Array Type" (radio buttons for Rooftop, Ground Mount Fixed (Open Rack), and Ground Mount 1-Axis Tracking). There is also a "PV size Selection" dropdown menu. A "Submit" button is located at the bottom right of the form area.

## No Cost to Start

ProtoGen's Microgrid Navigator  
<https://www.proto-gen.com/tools/>

## Contact

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