



U.S. DEPARTMENT OF
ENERGY



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Energy Storage in Chattanooga, TN: Creating Community Resiliency and Peak Demand Reduction with EPB

November 8, 2023

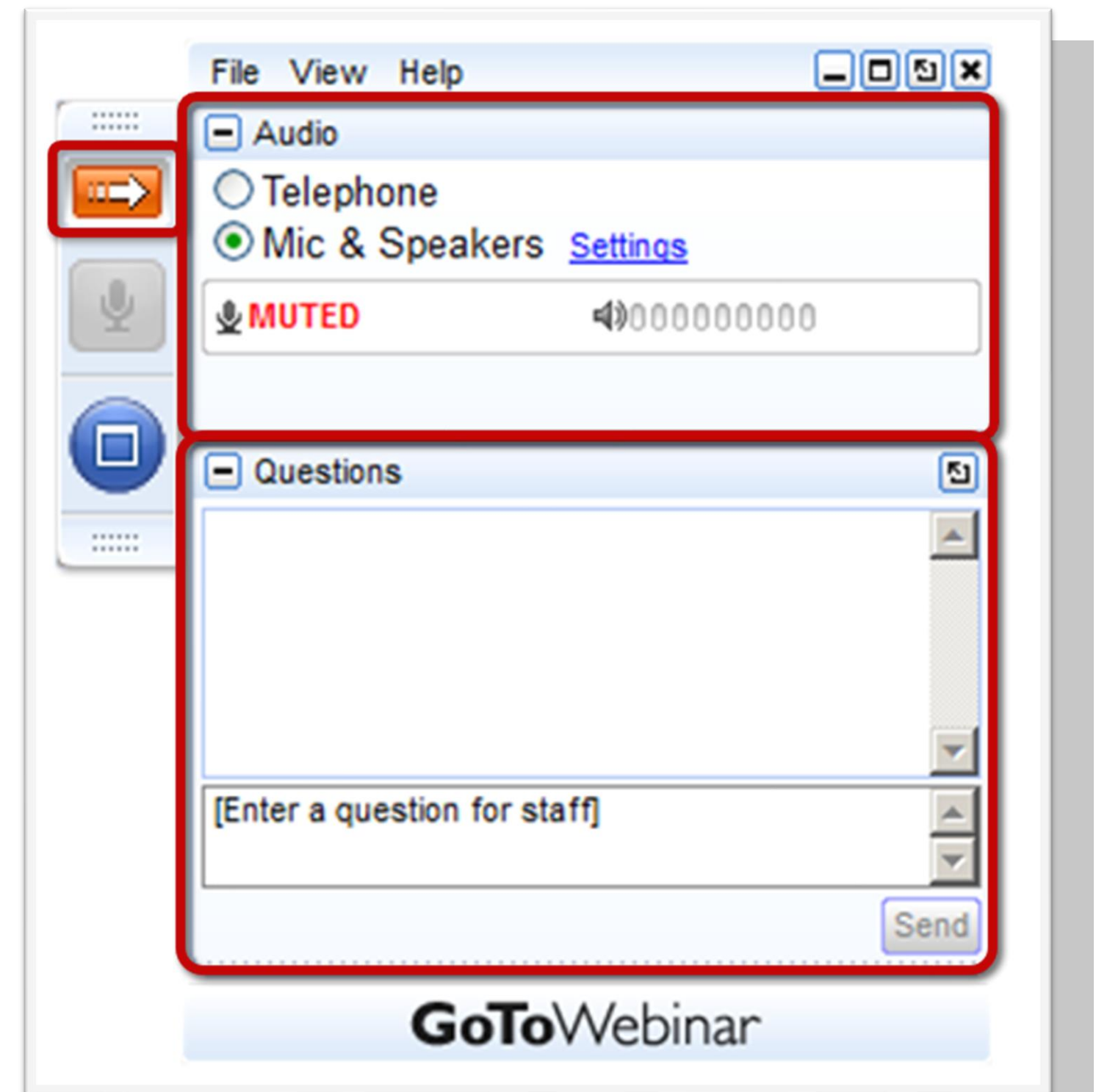
A Presentation of the Energy Storage Technology Advancement Partnership (ESTAP)

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The Clean Energy States Alliance (CESA) is a national, nonprofit coalition of public agencies and organizations working together to advance clean energy.

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Energy Storage Technology Advancement Partnership (ESTAP)

Conducted under contract with Sandia National Laboratories, with funding from US DOE Office of Electricity.

- Facilitate public/private partnerships to support joint federal/state energy storage demonstration project deployment
- Support state energy storage efforts with technical, policy and program assistance
- Disseminate information to stakeholders through webinars, reports, case studies and conference presentations

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Thank You!



Dr. Imre Gyuk

Director, Energy Storage Research,
U.S. Department of Energy



Waylon Clark

Energy Storage Program Demonstration Team Lead,
Sandia National Laboratories

Webinar Speakers

- **Dr. Imre Gyuk**, Director, Energy Storage Research, US Department of Energy Office of Electricity
- **Jim Glass**, Senior Manager, Smart Grid Development, EPB
- **Aaron Willey**, Planning Engineer, Smart Grid Development, EPB
- **Waylon Clark**, Energy Storage Program Demonstration Team Lead, Sandia National Laboratories
- **Todd Olinsky-Paul**, Senior Project Director, Clean Energy States Alliance





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Upcoming Webinar

Building the Foundation for Energy Resilient Communities: Clean Energy Group's Resilient Power Funding Programs' 2022 Impact (11/14)

Read more and register at
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EPB Storage Overview

November 2023



EPB of Chattanooga



- **Municipal Utility**
- **Distribution / Sub-Transmission**
- **Demand & Energy Rate from TVA**
- **190,000 Homes/Businesses**
- **Telecomm – “25 Gig City”**



Agenda

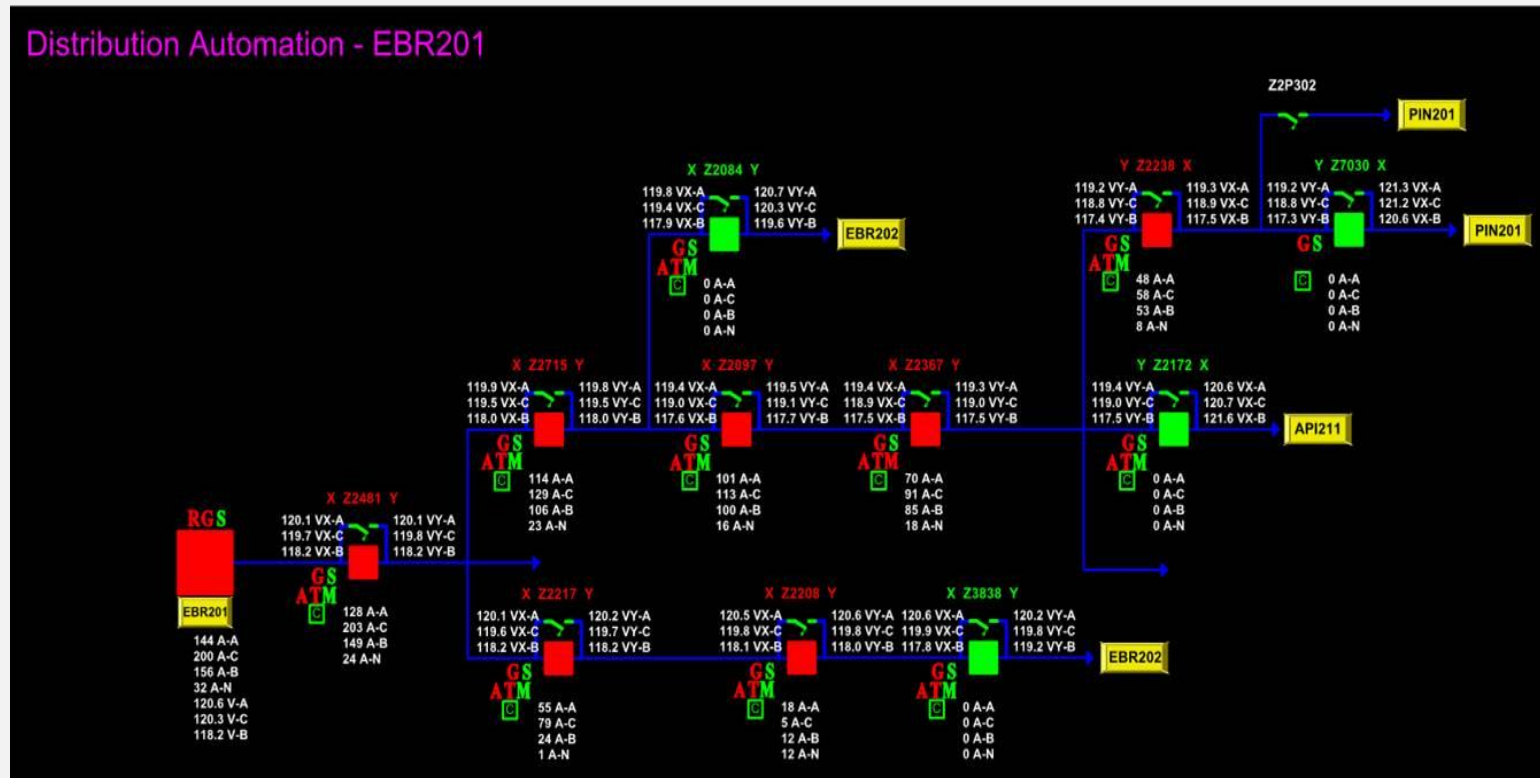
- How did EPB get started with energy storage?
- Why is EPB installing energy storage?
- What have we done so far?
- What's next?



Distribution Automation

1200 Automated Switches

Distribution Automation - EBR201



- 750 kW, 150 Customers between Switches
- All switches communicate via EPB Fiber Optic System



Airport MG - Solar PV



Existing Solar

- 2.6 MW Solar PV
- Owned by Airport
- Interconnection to EPB

- Projected funded by ARPA-E
- UT-Knoxville is project lead



Airport Microgrid



EPB Batteries

- Two 280 kW / 255 kwh
- Controlled thru SCADA
- Interconnection to EPB

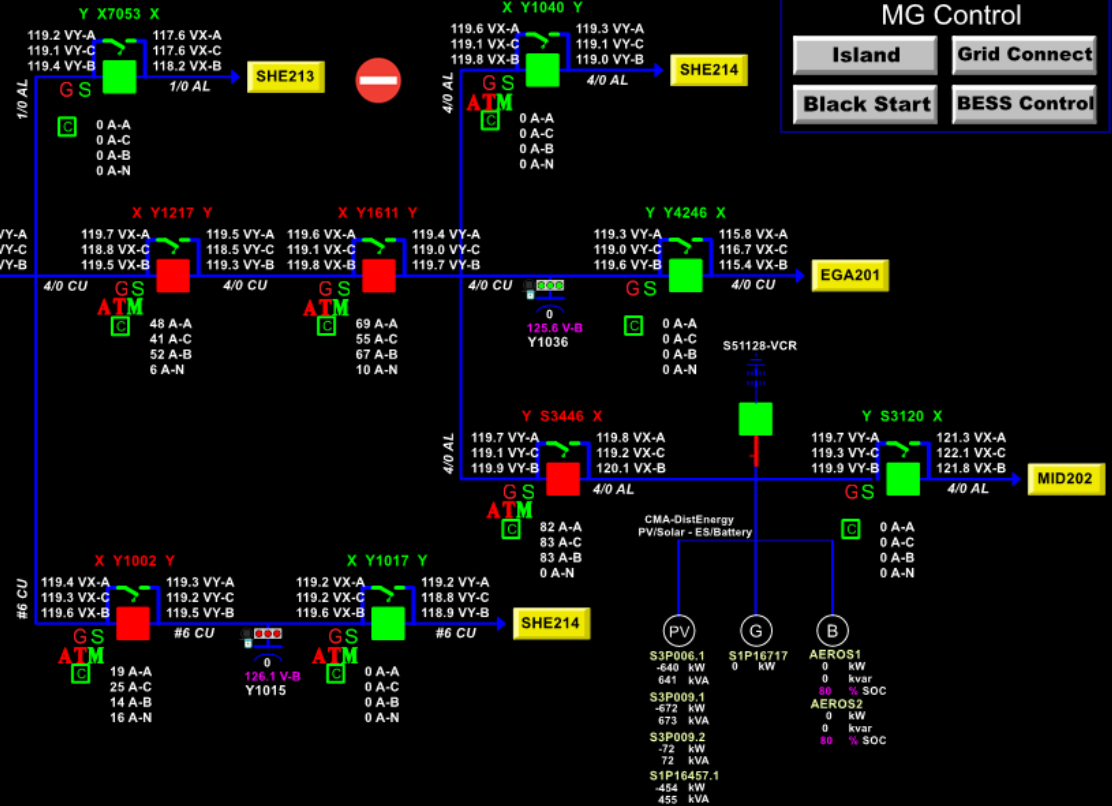
- Batteries used for demand reduction each month



Airport Microgrid

Distribution Automation - SHE215

[Click here for DMS View](#)



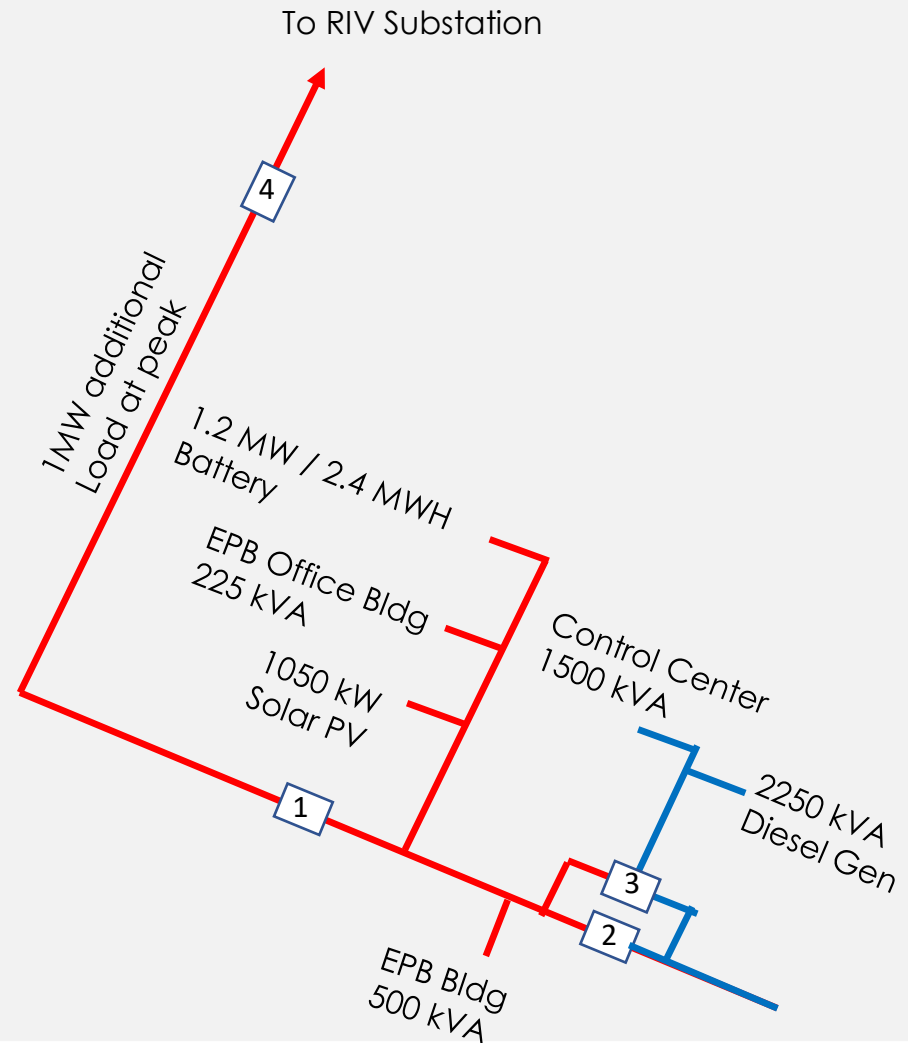
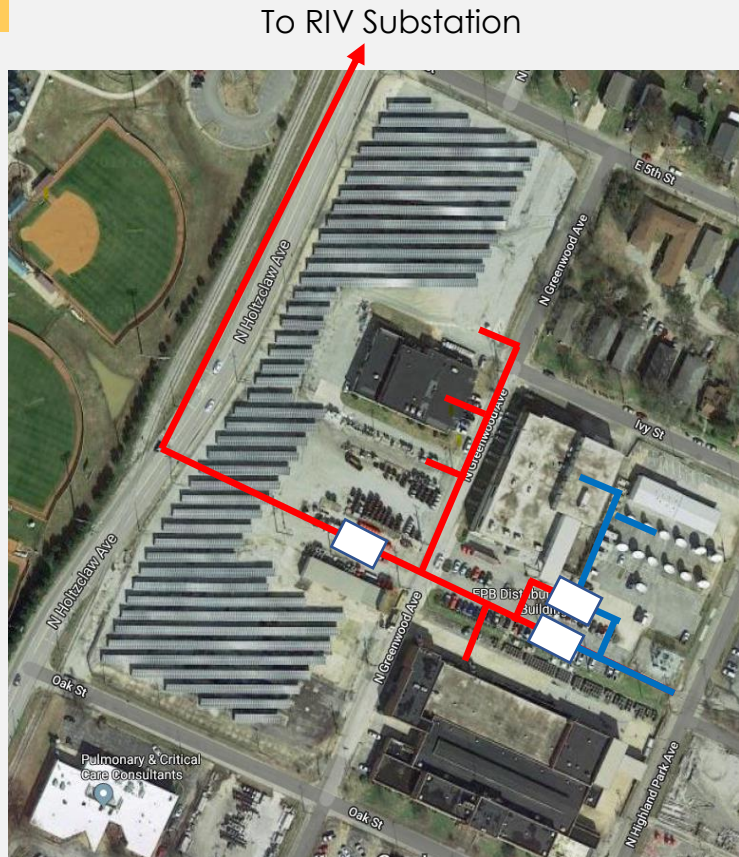
- Utilize Automated Switches, AMI Data from EPB
- MG Controller Integrated with EPB SCADA



Why Energy Storage?

- Resiliency
 - Critical Facilities
 - Radial Circuits
- Demand Savings
 - Wholesale Demand Charge from TVA
 - Summer: \$11.81/kW
 - Non-Summer: \$10.82/kW
- TVA Capacity

EPB Microgrid



- 1 – Normally closed Switch
- 2 – Normally open Switch
- 3 – Transfer Switch
- 4 – Normally closed Switch



EPB Battery



- 1.2 MW / 2.5 MWh
- Commissioned April 2022

- Partnered with DOE OE Stationary Energy Storage Program



EPB Battery Use Cases

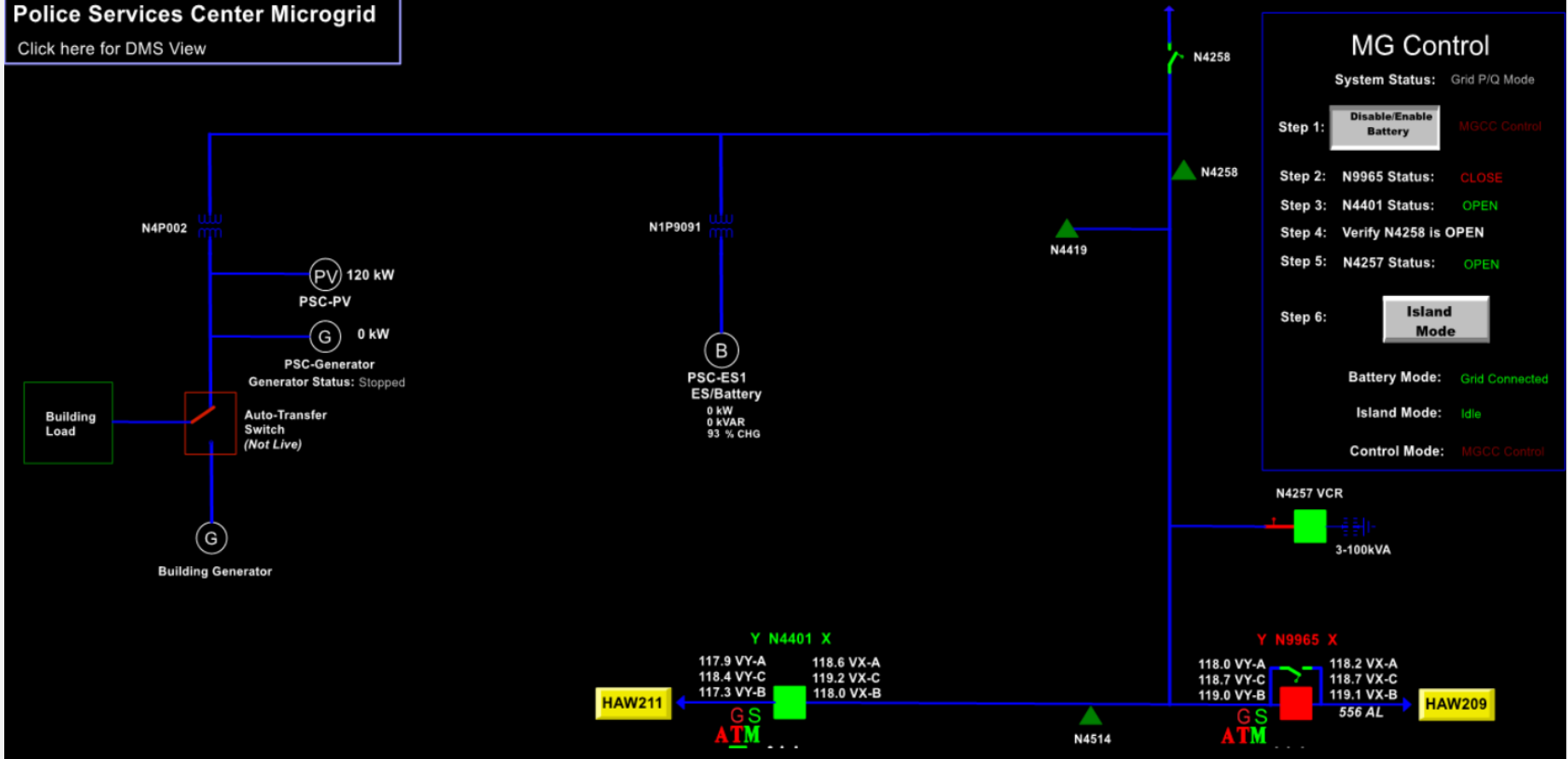
- **Demand Reduction:**
 - Annual Demand Savings : \$117k
 - NPV (4%, 20 years) : \$785k
- **Microgrid:**
 - Combined with existing 1 MW Community Solar
 - Utilizes existing automated switches for MG Boundary
 - Provides additional resilience for EPB Control Center Campus
- **TVA Capacity**
 - Utilized for demand reduction during December 2022
 - Energy Storage assets enabled EPB to avoid rolling blackouts for first day of event



Police Microgrid

Police Services Center Microgrid

[Click here for DMS View](#)



MG Control

System Status: Grid P/Q Mode

Step 1: **Disable/Enable Battery** MGCC Control

Step 2: N9965 Status: CLOSE

Step 3: N4401 Status: OPEN

Step 4: Verify N4258 is OPEN

Step 5: N4257 Status: OPEN

Step 6: **Island Mode**

Battery Mode: Grid Connected

Island Mode: Idle

Control Mode: MGCC Control

- Commissioned in 2022



Police Battery



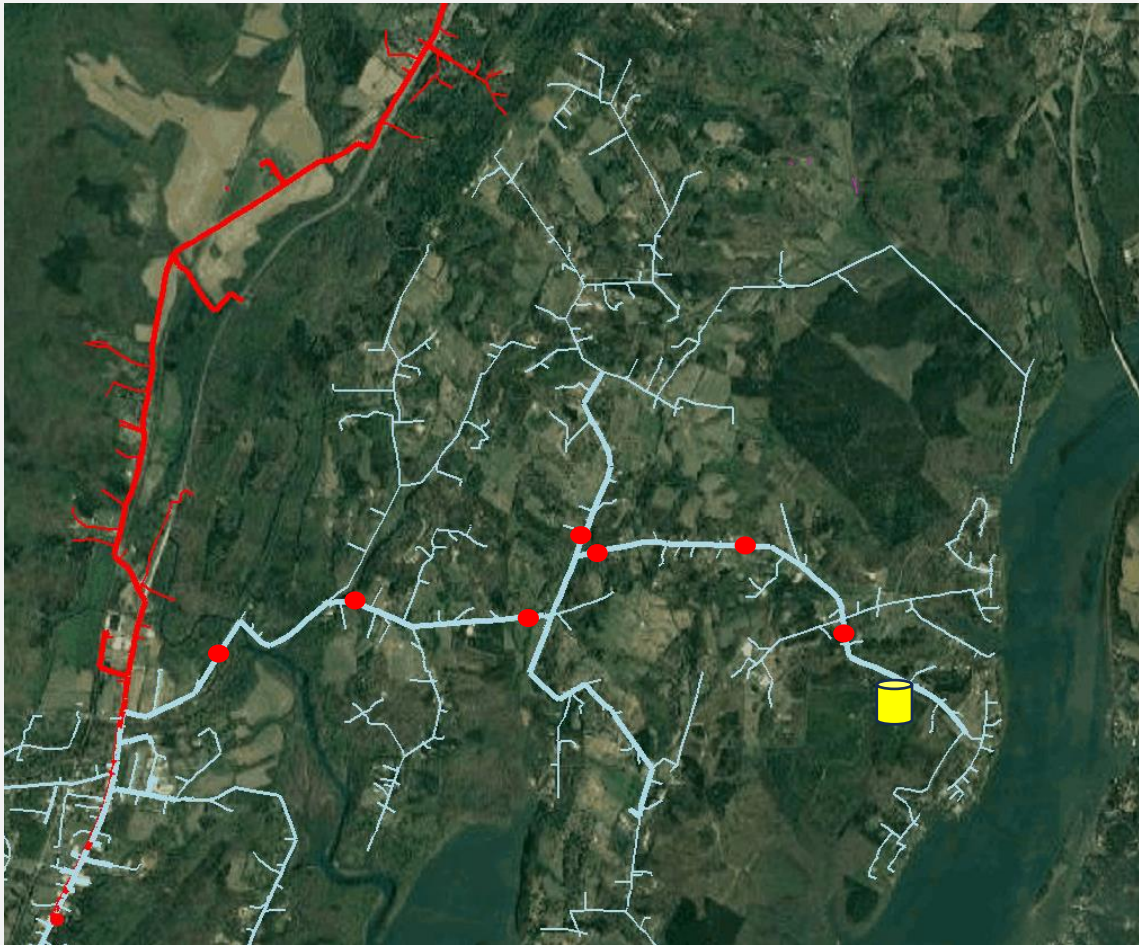
- 500kW / 1100 kWh
- Commissioned in September 2022

Chattanooga State Battery




- 4 MW / 8 MWh
- Commissioned in September 2022

Sale Creek Microgrid



● Automated Switch

 Energy Storage

- Edge of EPB Service Territory
- No Ties to support restoration
- Historically poor reliability



EPB Battery Status

In Service

Location	DER Asset	Capacity (kW AC)	Energy (kWh)	Available for Demand Reduction	Notes
EPB Community Solar	Battery	1250	2500	Yes	Commissioned Apr 2022
Chattanooga Airport	Battery	560	510	Yes	Commissioned Jun 2018
Amnicola Police / Fire Microgrid	Battery	500	1100	Yes	Commissioned Mar 2022
Chatt St Subst	Battery	4020	8040	Yes	Commissioned Jun 2022
Total		6330			

In Progress

Location	DER Asset	Capacity (kW AC)	Energy (kWh)
SAL202	Battery	2530	10120
BAK202	Battery	2500	10000
HAW201 - Trade School	Battery	1000	2000
Total		6030	



What's Next?

- Current RFP
 - Purchase 4 batteries / year for 5 years!
- Resiliency Projects
 - 13 feeder sections identified
 - Identifying property
- Demand Reduction Projects
 - 16 Vacant Substations
- DOE GRIP Grant – 6 Microgrids