

Energy Resilience in Milton

Town Center Microgrid Project



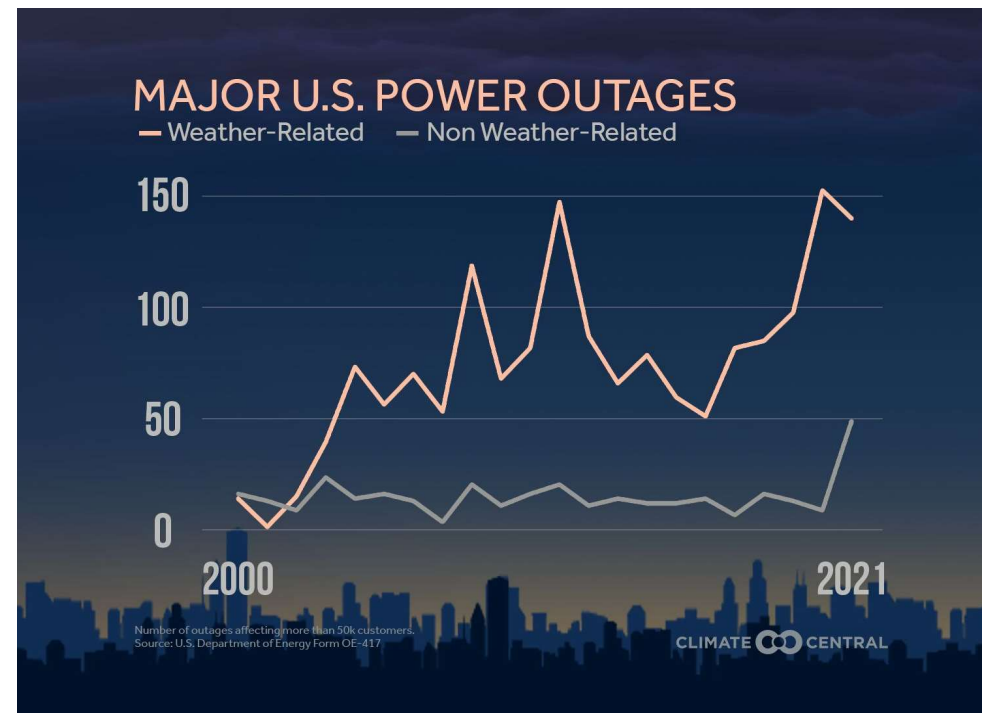
Agenda

- ▷ Project History & Background
- ▷ Energy Audit Findings
- ▷ Proposed Microgrid System
- ▷ Next Steps



Climate Change Threatens Our Grid

- Climate change is causing increasingly extreme weather events including extreme cold, heat waves, and severe storms, that stress or directly damage our energy infrastructure
- Power outages are becoming more frequent and more impactful in the face of more severe weather



Alignment with Town Goals



Municipal Vulnerability Preparedness Workshops

Priority Action #3

"Complete a feasibility study of microgrid power and renewable energy options for the town"



Milton Master Plan

Goal 6.2: Continue to provide Milton Residents With State-Of-The-Art Municipal Services & Continue to focus on implementing sustainability measures

Goal 6.3: Provide support to specific demographic groups in town & Support a growing elderly population wishing to "age in place"



Housing Production Plan

Promotes energy efficiencies and other sustainability provisions

Project Timeline

[illegible]



Town Hall

Milton PD

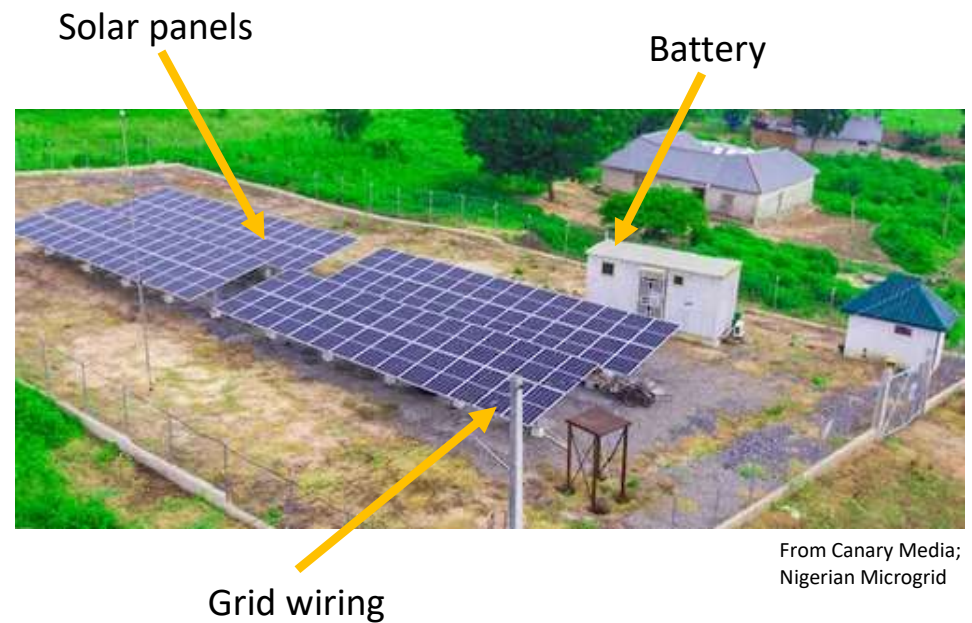
Winter Valley

We're here!

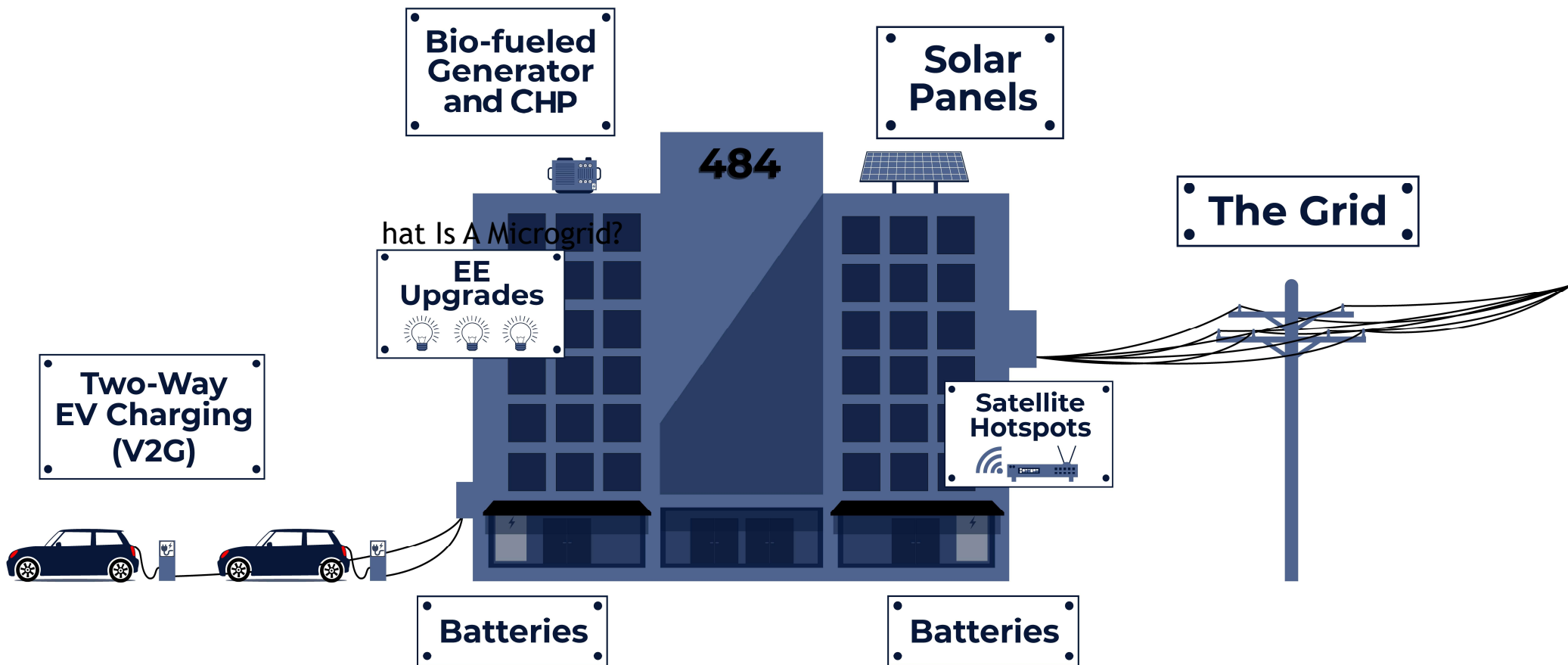
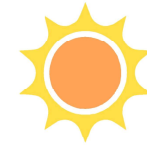
Project Areas

What Is A Microgrid?

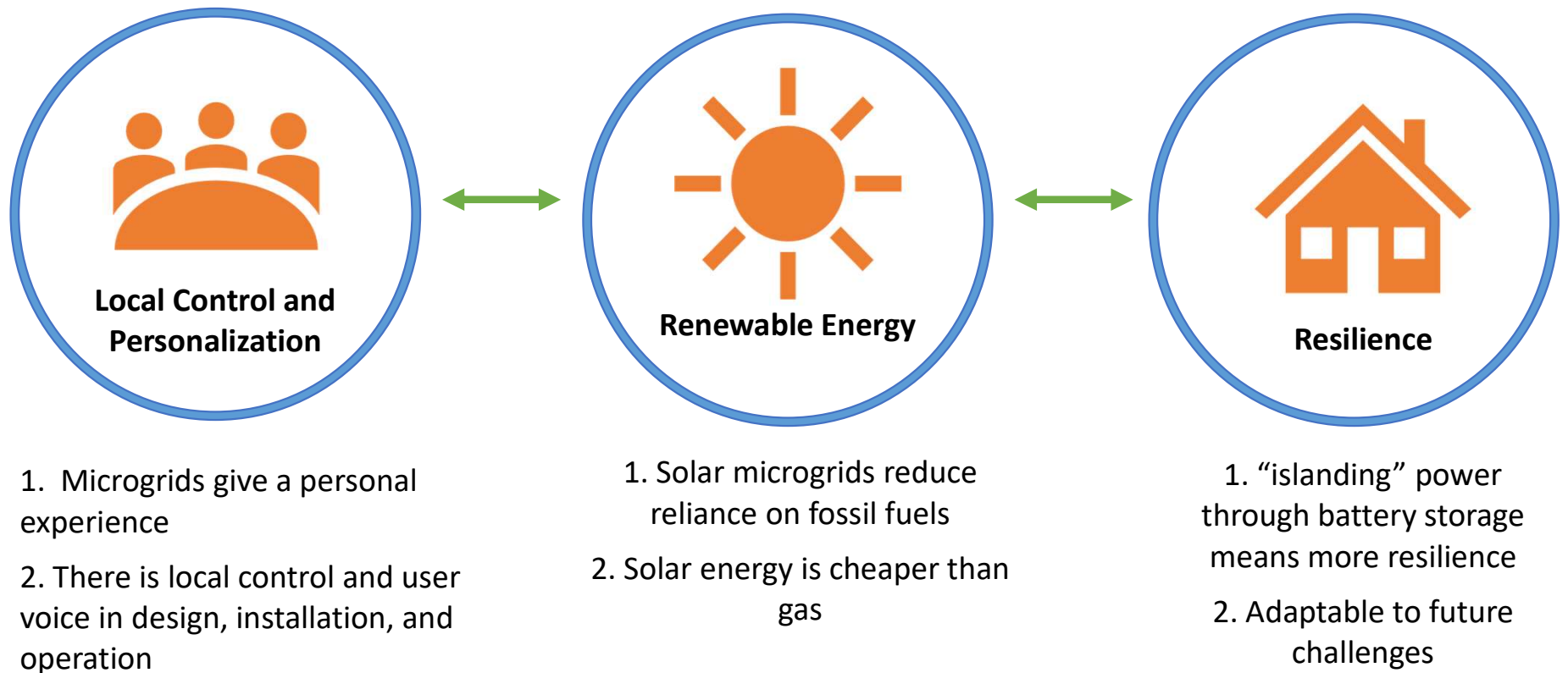
"a small network of electricity users with a local source of supply that is usually attached to a centralized national grid but is able to function independently".



What Is A Microgrid?



Why Microgrids?



What is an Energy Audit?

Stage 1

Completed on-site inspections, data gathering and analysis

To find opportunities for:

1. Energy-efficiency improvements & savings
2. Solar energy installations
3. Resilience via energy storage
4. Electrification
5. Any necessary electrical and building upgrades

Stage 2

Interviewed Winter Valley and Town managers

to identify the major needs, goals, limitations, and plans for each facility, and to ensure Town and WV objectives are met



Energy Audit Findings

- All three sites have a combination of roof, parking lot, and open space to meet most of their current energy use with on-site solar
- No energy efficiency upgrades are necessary to add on-site solar to meet demand, but minor energy efficiency upgrades would be advisable
- Select installations of air source heat pumps, conversion to LED lights, additional insulation, and replacement toilet and sink aerators would all increase building efficiency

An aerial photograph of a vast solar farm with rows of photovoltaic panels stretching towards the horizon. In the background, a city skyline is visible under a warm, orange-hued sky, suggesting a sunset or sunrise. The text is overlaid on the left side of the image.

Energy Resilience in Milton:

Preliminary Solar Microgrid Assessment

Key Feasibility Takeaways

A decorative horizontal line consisting of ten yellow rectangular dashes.

405 kW

Rooftop, ground mount, and canopy solar energy generation

382kW

Battery energy storage system (BESS) assets across the three facilities

\$1,996,000

Total project cost

79%

Project costs can be offset through incentives and loans

\$424,300

“Resilience Gap” that will require grants and/or capital funding to fill

Solar Power Installation



Town Hall

89 kW via a parking lot solar canopy, which is about 87% of our current energy consumption

With our existing **28.3 kW** panels, we will generate more energy than we use!

Milton PD

177 kW of solar PV in several arrays: three rooftop arrays, two parking lot canopies, and one ground mount array

The system is deliberately oversized to accommodate a potential community-shared solar program for which **52 kW** would be available annually

Winter Valley

139 kW of rooftop solar PV arrays on all buildings except building #5 due to roof space constraints

BESS Installation



- Town Hall
 - 54 kW battery, which is sized to meet the current monthly maximum coincident electricity demand of the Town Hall for four hours
- Milton PD
 - 40 kW battery sized to meet the current monthly maximum coincident electricity demand of the Police Station for four hours
- Winter Valley
 - Four 54 kW batteries at buildings #1-4 and two 36 kW batteries at building #5 and the Office

BESS Design

- Proposed design has one battery per building in the microgrid system
- Batteries are scaled to be either 36kW, 40 kW, and 54 kW
- Batteries are about 3 feet wide, 4 feet tall and 8 feet wide on a concrete pad
- About the size of a twin bed with a boxspring or a picnic table



Costs of PV and BESS Installation

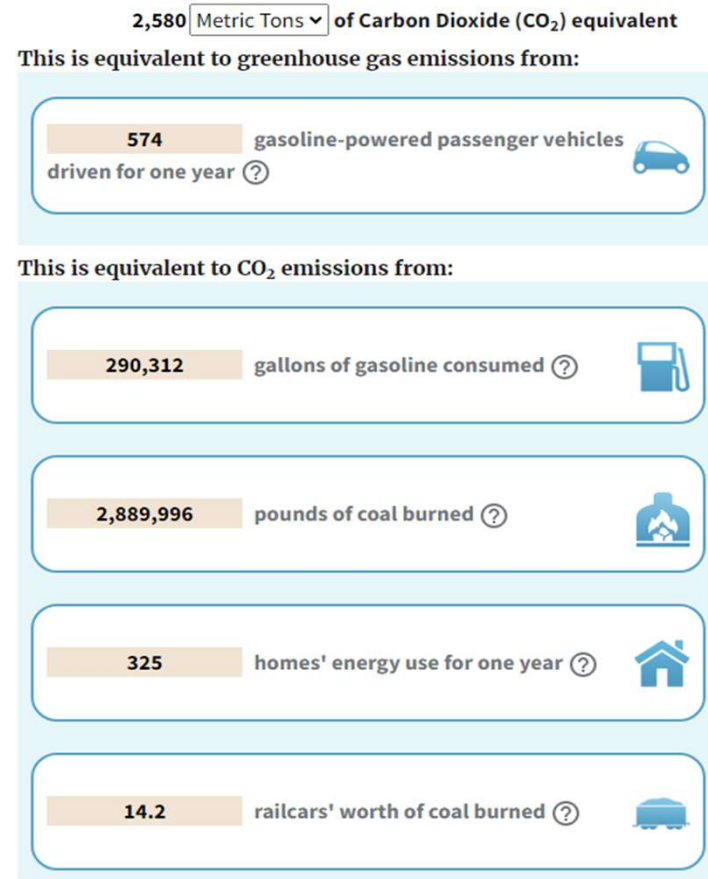
Milton, MA	Measure	PV kW	BESS kW	Cost
Town Hall	Solar PV	89		\$ 225,000
	BESS		54	\$ 178,000
	Sub Total			\$ 403,000
Police Department	Solar PV	177		\$ 354,300
	BESS		40	\$ 129,700
	Sub Total			\$ 484,000
Winter Valley	Solar PV	139		\$ 347,500
	BESS		288	\$ 761,500
	Sub Total			\$ 1,109,000
Totals All Measures		405	382	\$ 1,996,000

Project Costs

Milton, MA	Measure	PV kW	BESS kW	Total Cost	Resilience				
					Amount Financed (prior to 30% ITC)	Gap Payment Required for 10 Yr Payback	Resilience Gap as Percent of Total Cost	Approximate Amount Financed (net of 30% ITC)	
Town Hall	Solar PV + BESS	89	54	\$ 403,000	\$ 306,200	\$ 96,800	24%	\$	214,340
								\$	-
Police Department	Solar PV + BESS	177	40	\$ 484,000	\$ 411,500	\$ 72,500	15%	\$	288,050
								\$	-
Winter Valley	Solar PV + BESS	139	288	\$1,109,000	\$ 854,000	\$ 255,000	23%	\$	597,800
Totals		405	382	\$1,996,000	\$ 1,571,700	\$ 424,300	21%	\$	1,100,190

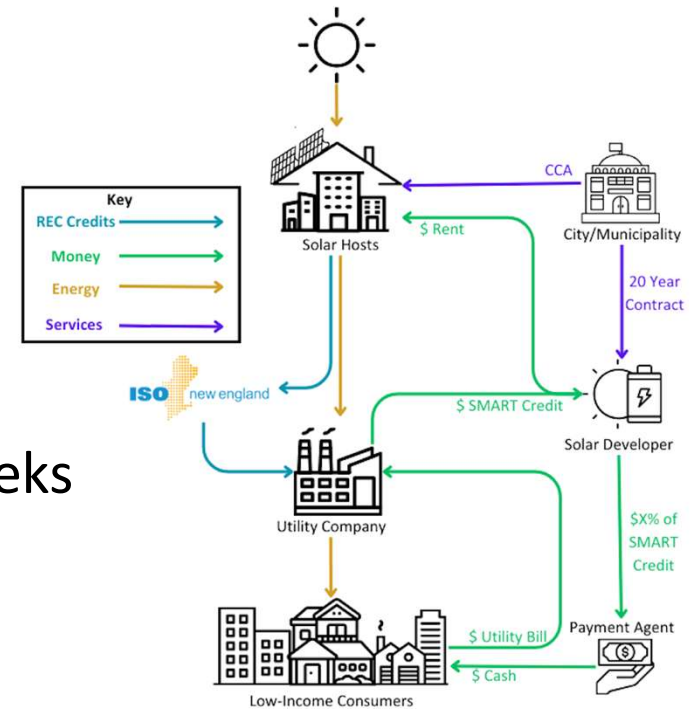
Environmental Impact

- Milton Town Hall and Milton PD can be entirely powered by solar energy and remove 170 metric tons of carbon emissions every year – equivalent to the energy use of over 20 homes!
- Over 10 years, the combined emissions reductions from this project will be 2,580 metric tons of carbon



Next Steps

- Your feedback tonight and over the next two weeks will be incorporated into a final feasibility report
- Our draft report is available at **townofmilton.org/microgrid**
- Milton was awarded almost \$150,000 through the MA Clean Energy Center's EmPower program to start implementation work at Winter Valley



A large white circle is centered on an orange background. To the left of the circle, a dashed yellow arc curves around its edge. At the bottom right of the circle, a small solid blue circle is positioned.

Community Feedback



Thank you!

Contact us

adespres@cleanenergysol.com

ddayton@cleanenergysol.com

JLee@townofmilton.org

JTurner@townofmilton.org