

Green Communities Annual Report Summary FY2023

Date of Annual Report Preparation: 11/21/2023 9:07:46PM

Prepared by: Susan McPhee

Title of Preparer: Energy Conservation Coordinator

Green Community Information

Municipality: Medfield

Baseline Fiscal Year: 2015

Criterion 1: As-of-Right Siting

Criterion 1 is met by a municipality passing zoning in designated locations for the as-of-right siting of renewable or alternative energy generating facilities, research and development facilities, or manufacturing facilities.

Type of as-of-right siting approval received: Solar PV

Have any significant changes been made to the zoning district(s) for which the community received Green Communities designation? No

Criterion 2: Expedited Permitting

Criterion 2 is met by a municipality adopting an expedited permitting process of one year at most, under which facilities interested in locating their facility in a designated renewable zone may be sited within the municipality.

Type of expedited permitting approval received: Local

Clean Energy Project Permitting

This table shows any changes made in FY2023 to clean energy projects on record that have been accepted for approval under the zoning for which the community received Green Community Designation.

Name	Type	Description	Status	Decision Date
{none}				

Criterion 3: Energy Use Baseline & Energy Use Reduction Plan

To demonstrate compliance with Criterion 3, municipalities must:

- Establish an energy use baseline inventory for municipal buildings and facilities (which can include schools, water, wastewater treatment plants and pumping stations, and open space), street and traffic lighting, and vehicles; and
- Adopt an Energy Reduction Plan (ERP) demonstrating a reduction of 20 percent of energy use after five years of implementation.

Community Baseline Year: FY2015

Energy Reduction Progress

Category	Baseline (FY2015)	FY2021	FY2022	FY2023
Building Use (MMBTU)	55,558	46,738	48,919	41,009
%Diff from Baseline		-15.87%	-11.95%	-26.19%
Open Space Use (MMBTU)	53	96	100	81
%Diff from Baseline		79.64%	87.60%	51.87%
Street/Traffic Lights Use (MMBTU)	390	149	149	149
%Diff from Baseline		-61.66%	-61.75%	-61.71%
Vehicle Use (MMBTU)	7,318	7,315	7,327	6,816
%Diff from Baseline		-0.03%	0.12%	-6.86%
Water/Sewer Use (MMBTU)	3,664	3,332	3,264	3,065
%Diff from Baseline		-9.05%	-10.91%	-16.33%
Adjustments				
Building Stock Changes	0	-2,550	-2,568	-2,528
Regional School Districts				
Totals	66,982	55,081	57,191	48,592
% Diff from Baseline		-17.8%	-14.6%	-27.5%

Energy Conservation Measures (ECMs)

Changes made to the community's ECM record for FY2023

Location	ECM Name	Status	Start Date	End Date
Medfield Administration	EMS	Planned	9/1/2026	
Town Hall	Roof repairs	Planned	10/1/2025	1/1/2026
Town Hall	Exterior Envelope Sealant Replacement	Planned	1/20/2025	
Town Hall	HW heater replacement	Planned	6/1/2024	9/1/2024
Town Hall	AHU (Air Handling Unity) repairs	Planned	6/1/2024	9/1/2024
Town Hall	fan coil units (repair/replace)	Planned	6/1/2024	11/1/2024

Location	ECM Name	Status	Start Date	End Date
Town Hall	Chiller Plant Recommissioning	Planned	1/20/2024	
Town Hall	Exhaust Fan Repair	Planned	1/20/2024	
Town Hall	Exhaust Fan Repair	Planned	12/1/2023	6/1/2024
Town Hall	Attic Insulation	Planned	8/23/2023	10/1/2024
Town Hall	Exterior Envelope Façade Repairs	Planned	6/1/2023	10/1/2024
Town Hall	study for heat pumps	Active	1/15/2023	6/1/2023
Town Hall	EV charging	Complete	8/11/2022	12/20/2022
Town Hall	fan coil units (repair/replace)	Active	1/26/1900	
Council on Aging	Building Envelope Repair	Planned	1/20/2024	
Fuel	Fleet Management Strategies	Active	9/15/2023	
Fuel	Anti-Idling Policy	Planned		
Fuel	Anti-Idling Policy	Planned		
Library	Brick Façade Engineering/Repair	Planned	9/1/2027	
Library	Extrior sealant repair	Planned	9/1/2027	
Library	ATC Controls Upgrade	Planned	9/1/2026	
Library	EPDM Roof Engineering/Repair	Planned	9/1/2025	
Schools				
Blake Middle	Replace windows at curtain wall café	Planned	6/15/2027	
Blake Middle	Behavioral Based Measures	Planned	10/1/2026	
Blake Middle	brick façade repair	Planned	1/25/2026	
Blake Middle	Replace sealants at Windows/Doors	Planned	1/24/2026	
Blake Middle	brick façade repair	Planned	1/20/2026	
Blake Middle	Brick Façade Repair Engineering	Planned	1/20/2026	
Blake Middle	Replace Shut Off Valves	Planned	1/20/2025	
Blake Middle	Roof Top Units Repair	Planned	1/20/2025	
Blake Middle	Replace windows at curtain wall café	Planned	1/20/2025	
Blake Middle	VFDs	Planned	3/15/2024	6/28/2024
Blake Middle	Replace sealants at Windows/Doors	Planned	1/20/2024	
Blake Middle	Roof Insulation - partial	Active	10/22/2023	
Blake Middle	Gym HVAC/Fan Coil Unit Replace,ent	Complete	6/1/2023	7/20/2023
Blake Middle	Replace HW heater W ASHP	Complete	8/5/2022	10/20/2023
Blake Middle	Roof Insulation	Complete	7/1/2022	10/17/2022
Blake Middle	Boiler replacement	Complete	7/1/2022	9/2/2022
Medfield High	window weatherstripping	Planned	1/15/2027	
Medfield High	EMS	Planned	6/1/2026	
Medfield High	Remove Shower Heads	Planned	1/26/2026	
Medfield High	Window repair	Planned	1/26/2026	
Medfield High	Brick Façade Repair	Planned	1/26/2026	

Location	ECM Name	Status	Start Date	End Date
Medfield High	Exterior door replacement	Planned	7/1/2025	
Medfield High	Behavioral Based Measures	Planned	1/24/2025	
Medfield High	boiler replacement	Planned	1/20/2025	
Medfield High	Window sealant replacement	Planned	1/20/2025	
Medfield High	window weatherstripping	Planned	1/20/2024	
Medfield High	Air Handling Units (replace/repair)	Active	9/15/2023	
Medfield High	Rooftop Units (RTU) Repair	Active	9/15/2023	10/30/2023
Medfield High	Replace Shut Off Valves	Active	9/15/2023	
Medfield High	VFDs 2 x 25 HP pump motors	Planned	8/23/2023	
Medfield High	Envelope sealant replacement	Planned	1/20/2023	
Medfield High	Window repair	Planned	1/20/2023	
Medfield High	Brick Façade Repair	Planned	1/20/2023	
Medfield High	EV charging	Complete	8/12/2022	12/15/2022
Medfield High	LED lighting	Complete	6/1/2022	8/15/2022
Medfield High	Gym lighting LEDs	Complete	5/16/2022	7/15/2022
Medfield High	Replace Shut Off Valves	Planned	1/20/2022	
Medfield High	Replace Shower Head	Planned	1/20/2022	
Medfield High	Air Handling Units (replace/repair)	Planned	1/20/2022	
Medfield High	Rooftop Units (RTU) Repair	Planned	1/20/2022	
Medfield High	Exterior door replacement	Planned	1/20/2022	
Memorial Elementary	Johnson Controls BMS Upgrade	Planned	1/20/2025	
Memorial Elementary	Roof Top Units Repair	Planned	1/20/2025	
Memorial Elementary	VFDs 2 x 7.5 HP pump motors	Planned	6/1/2024	
Memorial Elementary	Roof Top Units Repair	Active	9/15/2023	
Memorial Elementary	Replace Split Systems	Complete	1/20/2023	7/31/2023
Memorial Elementary	Scoping study for electrification	Active	12/1/2022	
Memorial Elementary	Simulator nodes	Complete	5/2/2022	7/15/2022
Memorial Elementary	low flow aerators	Planned	1/26/1900	
Memorial Elementary	Roof Top Units Repair	Active	1/26/1900	
Memorial Elementary	EMS	Planned		
Memorial Elementary	Controls BMS Upgrade	Complete		6/22/2023
Memorial Elementary	Replace HW Heater and Shut Off Valves	Complete		2/22/2023
Memorial Elementary	EMS	Planned		
Wheelock Elementary	electrical upgrades	Planned	1/20/2027	
Wheelock Elementary	replace pneumatic temp controls	Planned	9/1/2025	
Wheelock Elementary	Replace Shut Off Valves	Planned	1/20/2024	
Wheelock Elementary	Replace Tempering Valves	Planned	1/19/2024	
Wheelock Elementary	replace valves to FanCoils Units	Planned	1/10/2024	
Wheelock Elementary	Exhaust Fan Replacement	Active	11/1/2023	

Location	ECM Name	Status	Start Date	End Date
Wheelock Elementary	fan coil units (repair/replace)	Active	11/1/2023	
Wheelock Elementary	heat pump DHW	Complete	9/15/2022	11/10/2023
Wheelock Elementary	EV charging stations:	Complete	8/1/2022	12/5/2022
Wheelock Elementary	Replace Tempering Valves	Active	1/26/1900	
Wheelock Elementary	Replace Shut Off Valves	Active		
Wheelock Elementary	Exhaust Fan Replacement	Active		

Top 5 Buildings per Energy Use

In FY2023, municipal operations used 48,592 MMBtu of energy. The five buildings below accounted for 64% of the community's overall energy use.

Building Name	Energy Consumption MMBtu (% of overall energy use)
1. Medfield High	11,698 (24%)
2. Blake Middle	6,940 (14%)
3. Dale Street Elementary	4,733 (10%)
4. Wastewater Treatment Plant	4,051 (8%)
5. Memorial Elementary	3,672 (8%)

Top 5 Buildings per Emissions

In FY2023, there were 2,932 MTCO2e emitted from municipal operations. The five buildings below accounted for 61% of the community's overall emissions.

Building Name	Emissions MTCO2e (% of overall emissions)
1. Medfield High	700 (24%)
2. Blake Middle	407 (14%)
3. Dale Street Elementary	262 (9%)
4. Memorial Elementary	217 (7%)
5. Wheelock Elementary	196 (7%)

Top 5 Buildings per Energy Use Intensity (EUI)

Energy Use Intensity (EUI) is calculated by dividing the total energy consumed by the building in a year by the building's square footage. EUI is a measure of a building's energy efficiency – like miles per gallon for cars – and can be a good indicator of buildings needing efficiency upgrades.

Building Name	Size (Square Feet)	Energy Consumption MMBtu	EUI (kBtu per ft ²)
1. Wastewater Treatment Plant	4,000	4,051	1,013
2. Dale Street Elementary	53,029	4,733	89
3. Pfaff Center	8,568	753	87
4. Medfield High	160,473	11,698	73
5. Memorial Elementary	58,584	3,672	63

Energy Narrative:

The Town of Medfield is working very hard to reduce energy use and carbon emissions. As of this report, the town's energy use non weather normalized is down -27.5% vs baseline (2015), and down -14.6% vs. LY, FY22. Weather normalized the town is down -16.4% vs baseline and down -8.1% vs. LY, FY22. Building energy use is down -26.2% vs baseline and vehicles are down -6.9%. This trend should continue with the town beginning to purchase hybrid vehicles.

Many ECMs have been completed and many more are in the works, with the Memorial School as the focus for an electrification project in the next several years. The town's top energy users are consistently schools. The High School used 11,698 MMBTUs during FY23, 24% of the town's municipal energy use. A Green Communities project will install VFDs on the 2 25 HP heating circulation pumps this year, which will help diminish use. The Blake Middle School is a real success story - during FY23 the Blake used 6940 MMBTUs vs 9951 MMBTUs in FY22, - 30%. This is the result of two big projects - a new high efficiency boiler now in the lead position as well as heat pump DHW installed via a Green Communities Grant. The Blake is still the second biggest energy user in town, but is consistently reduced, now -22.8% vs 2015 baseline. The Dale Elementary School is the third highest energy consumer at 4733 MMBTUs in FY23, or 10% of town use. The Dale will be replaced in future, therefore the town is not doing energy projects in the school. The Waste Water Treatment Plant, Memorial Elementary School and Wheelock School all use a similar amount of energy, about 3500-4000 MMBTUs. The Wheelock has new heat pump DHW system that will improve performance. The Memorial is being studied for electrification. The Waste-Water Treatment Plant is by far the highest EUI at 1,013 which is down from 1,180 in FY22. The Dale ES is second, at 89, but due to be replaced. The Pfaff Center is a small, old facility at 89 EUI, is down from 90 in FY22 and 95 in FY21. The High School is high at 73 in FY23, but down from previous years' 79 and 78, as well as baseline 2015 at 98. Worth noting that the Blake's strong results also show in EUI of 57, down -30% vs FY22.

Criterion 4: Fuel Efficient Vehicles

Fleet Changes for FY2023

Criterion 4 requires all departments within a Green Community to purchase fuel-efficient vehicles for municipal use, whenever such vehicles are commercially available and practicable.

Status	Model Year	Make	Model	Trim
Added +		Unable to Decode		
Added +		Unable to Decode		
Added +		Unable to Decode		
Added +	2022	Chevrolet	Colorado	Work Truck
Added +	2022	Ford	F-550 Super Duty	
Added +	2023	Chevrolet	Tahoe	
Added +	2023	Mack	Granite	

Has the municipality transferred any vehicles from one department to another? Yes

Were the vehicle(s) being transferred more fuel-efficient than the vehicle(s) replaced? Yes

Criterion 5: Stretch Code Adoption

Criterion 5 requires that municipalities minimize the life-cycle cost of all newly constructed homes and buildings. DOER recommends communities do this by adopting the Stretch Code (225 CMR 22 and 23).

Is Stretch Code still in effect? Yes

Has the community adopted the Specialized Opt-in Stretch Code? No

How many occupancy permits were issued for new commercial construction over 100,000 sq.ft.? 0

Stretch Code Narrative:

HERS has been in effect for long enough now that it is fairly well understood. The town is discussing the Specialized Stretch Code, but has not acted yet. Spring Town Meeting would be the next opportunity and it remains to be seen if Medfield will put this forward.

Other Notes

Additional Measures Narrative:

Medfield is energetically pursuing sustainability throughout town. The town has adopted a Climate Action Plan. The very active Energy Committee has worked with the Select Board and Capital Committees to help fund paths to electrification for several municipal buildings, in addition to many actions on the residential side such as EV Events, Heat Pump and Solar Outreach, educational events and much more. During the past year, the town's first two heat pump projects were completed - DHW at the Blake and Wheelock. The Town is grateful for Green Communities funding for a heat pump RTU for the library, which will partially electrify this key town facility. These precedents of electrification will help create momentum for additional electrification projects throughout both the municipal buildings as well as residents homes. Medfield Energy Committee is focusing on electrification in town infrastructure and achieving net zero goals. A corollary goal is to qualify for Green Communities 2.0. Committee work in the coming months will likely focus on this effort.

Renewable Energy Narrative:

The Town of Medfield used 376,803 kWh of renewable energy during FY23. All of this is from onsite generation in town, net metered at three facilities. The DPW rooftop array began generating during this FY, increasing our fraction of RE to 7.1% of total municipal usage. During FY23 and 24, the town aims to complete closure of a landfill so that we can proceed with a ground mount solar array at the site. Additionally, there are several school roofs and parking areas that are in the works for solar PV via PPAs with Solect. These projects will also increase the fraction of our electricity use generated with clean renewable energy. Unfortunately, rooftop arrays at schools are predicated on roof replacement projects, so it is likely that the parking canopy projects will move forward more rapidly than the rooftop arrays.

The report must be signed by the community's Chief Executive Officer. The Chief Executive Officer is defined as the manager in any city having a manager and in any town having a city form of government, the mayor in any other city, and the board of selectmen in any other town unless some other officer or body is designated to perform the functions of a chief executive officer under the provisions of a local charter or laws having the force of a charter. Any signatures of designees will be considered an attestation that the signatory has been designated the designee by the municipality.

I confirm that I have reviewed this report and verify all information is true.

OSLER L. PETERSON

Print Name

SELECT BOARD CHAIR

Title

OLP

Signature

11/28/2023

Date