

# City of Newton Municipal Energy Report

FY 22/23

Prepared Feb. 2023

Rev. June 15, 2023

### Criterion 3 - TABLE 2 PROGRESS

**Table 2 Instructions:**

- 1) If you haven't already, enter your communities name on the **General Instructions** tab. If you have already entered your communities name on the **General Instructions** tab and your Baseline year hasn't updated then please manually enter your community's baseline year (including whether it's a **Fiscal Year or Calendar Year**)
- 2) Enter total MMBtus per category (Rows 10-15) for the baseline year and the current reporting year. In **MassEnergyInsight**, this information is available in the top table on "Annual Report Table 2" report
- 3) If this is your community's first Annual Report, enter the energy consumption for past years as needed
- 4) If your community did not submit an Annual Report last year, enter energy data for 2020 and 2021
- 5) If your baseline includes a proportion of energy consumed by a regional school district, provide the pro-rated energy use in Row 18 for non weather-normalized use and Row 22 for weather-normalized use. Attach a worksheet (add a tab to this workbook) listing the buildings, their total energy use, and calculations on how you arrived at their prorated use
- 6) If your community needs to pro-rate energy use due to building stock changes, use the calculator provided on the tab to the left and enter the resulting numbers in Row 17 for non weather-normalized data, and in Row 21 for weather-normalized data.

**Weather Normalized Data Instructions**

DOER is requiring Green Communities to assess their progress using weather-normalized data through a DOER-approved weather normalization methodology. Qualifying methods include use of **MassEnergyInsight** or **Energy Star Portfolio Manager**. Enter **weather-normalized Grand Total energy consumption in Row 20 on this tab**. In **MassEnergyInsight**, this information is available within the bottom report of the "Annual Report Table 2" report page.

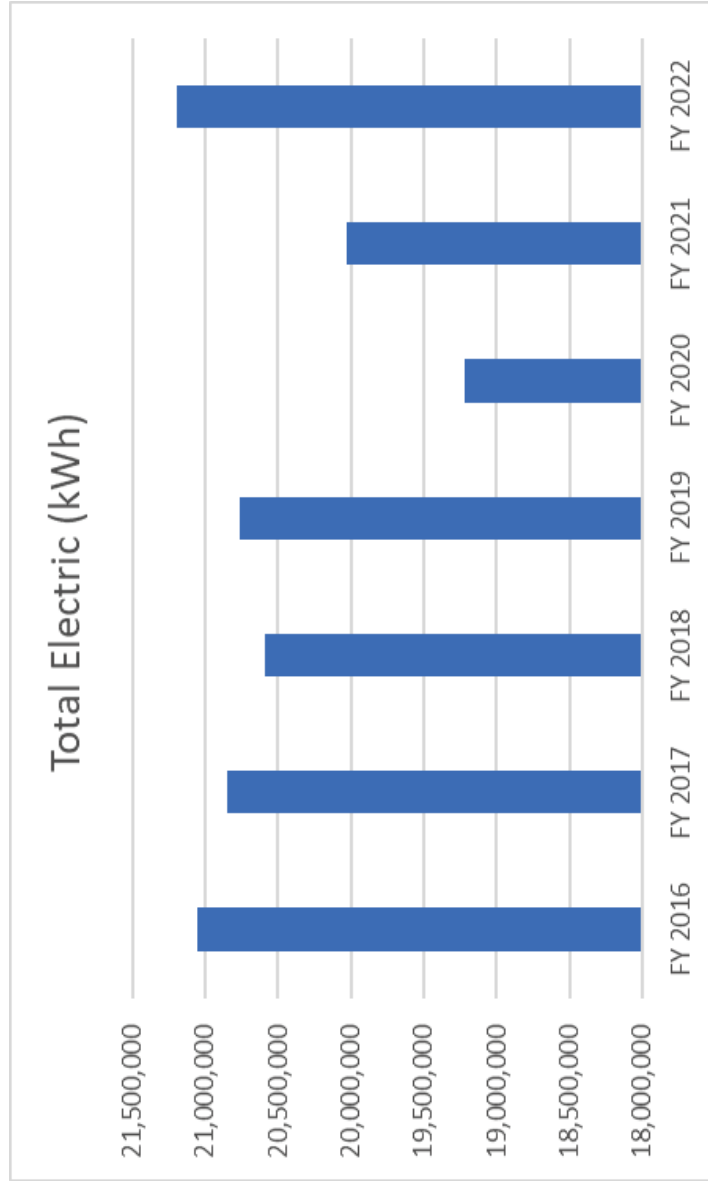
Please contact your Regional Coordinator for assistance if you use a different energy-tracking tool.

**Does the Community use Calendar Year (CY) or Fiscal Year (FY)?**

FY

**Table 2: Timeline of Annual Municipal Energy Use**

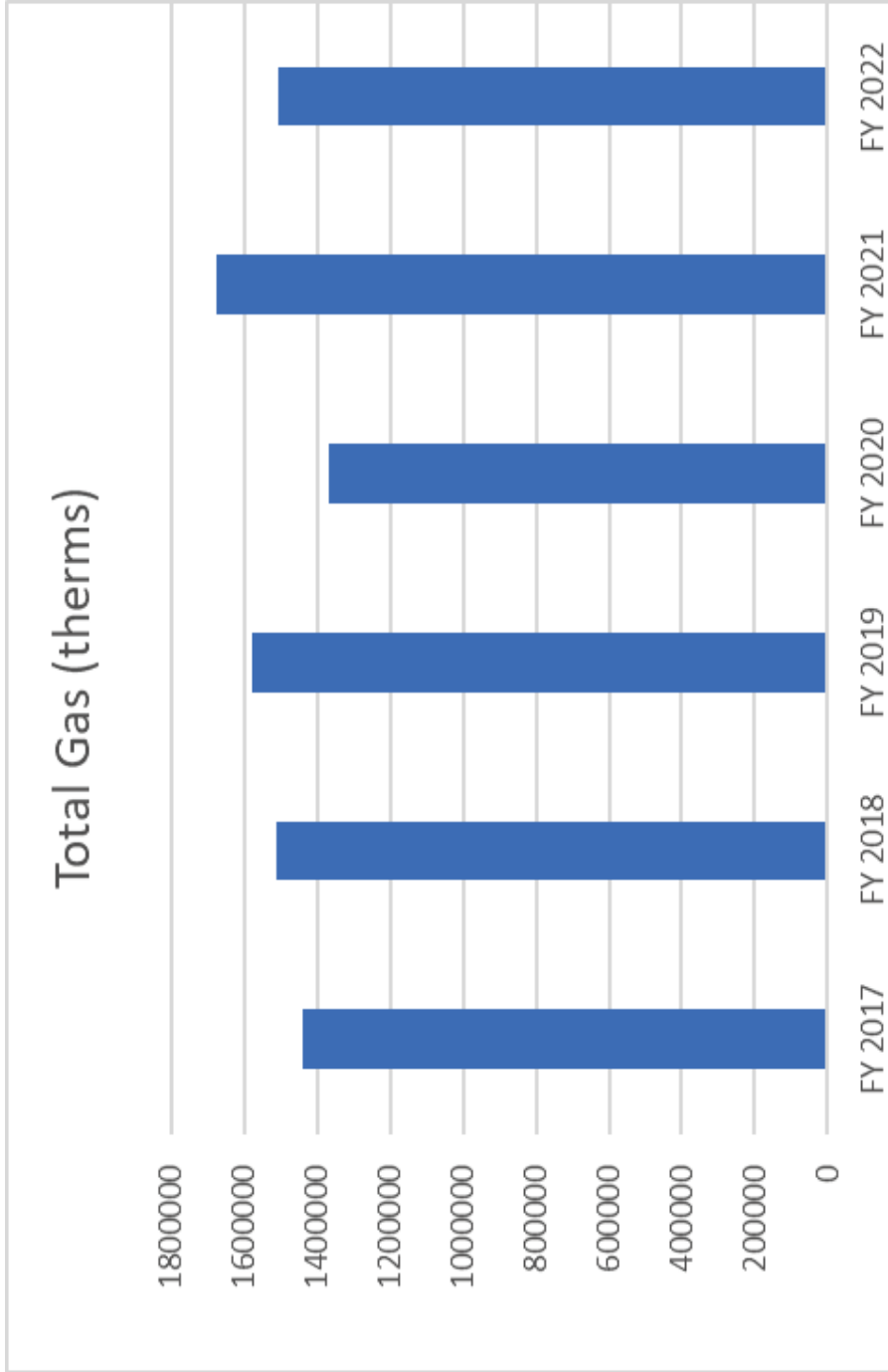
Category	Baseline				MMBtu	MMBtu	MMBtu	MMBtu	For Most Recent Year: Change vs. Baseline (%)
	2008	2020	2021	2022					
Null									Enter baseline year consumption in column D
Buildings	245,870				217,906				-11.4%
Open Space	547				597				9.1%
Street & Traffic Lights	15,192				5,046				-66.8%
Vehicles	34,753				33,862				-2.6%
Water/Sewer	3,469				3,658				5.4%
<b>Adjustments</b>									
<i>Building Stock Change [see previous tab]</i>					(6,567)				
<i>Regional School [see Crit 3 - Overview tab for information Regional School %]</i>									
<b>TOTAL ENERGY CONSUMPTION (No Weather Normalization)</b>	299,831				254,502				-15.1%
<b>Weather Normalized Consumption [see instructions above]</b>	303,211				271,329				-10.5%
<b>Adjustments</b>									
<i>Building Stock Change (weather normalized)</i>					(6,731)				
<i>Regional School (weather normalized)</i>									
<b>TOTAL ENERGY CONSUMPTION (Weather Normalized)</b>	303,211				264,598				-12.7%



	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Total Electric (kWh)	21,056,000	20,848,146	20,584,315	20,766,353	19,220,291	20,031,152	21,192,123

# Electricity-Change in kWh use

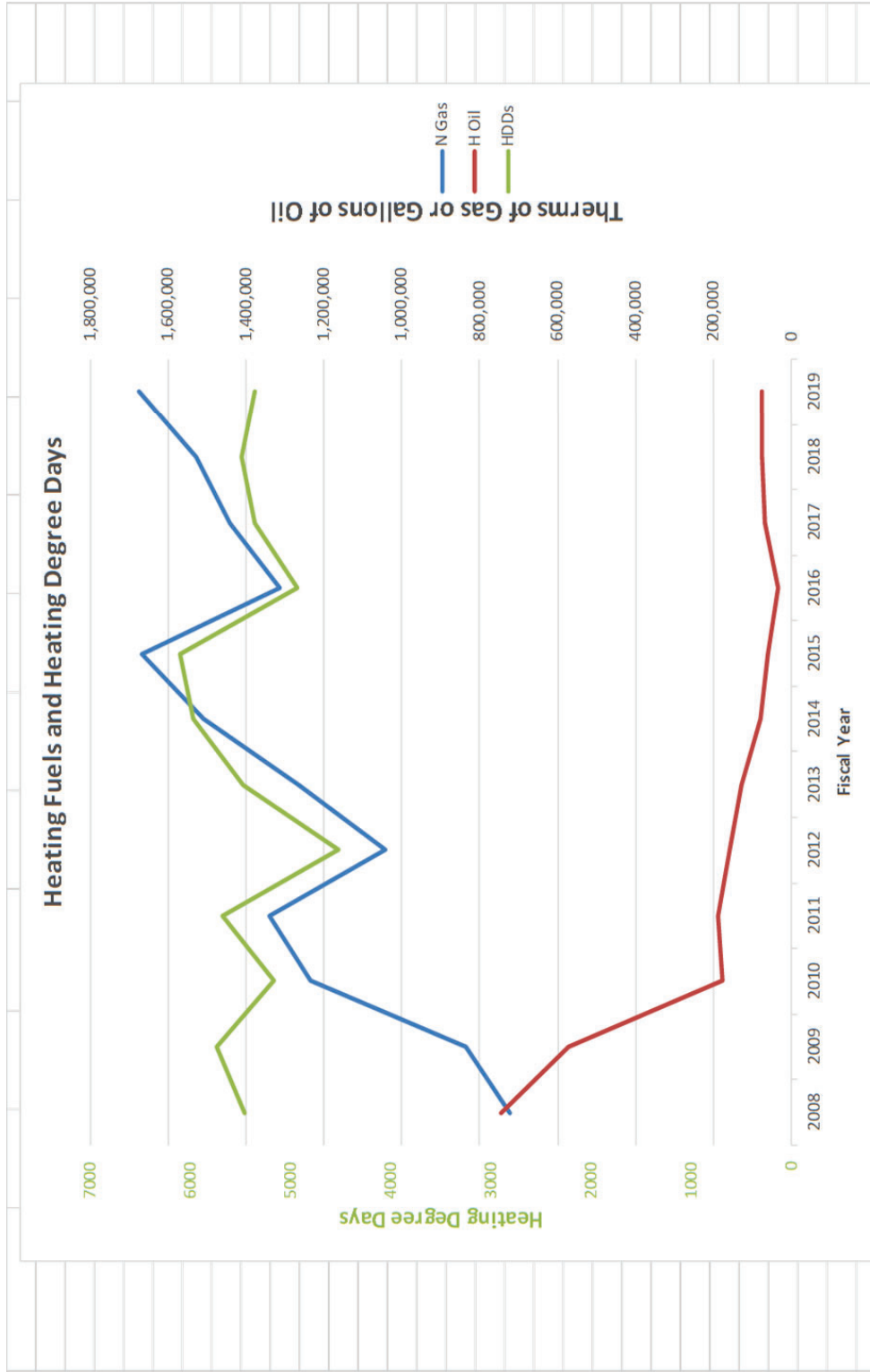
	FY 2019	FY 2022	kWh change	% Change
Main Library	856,360	1,169,889	313,529	37%
Horace Mann (formerly Newton Cultural Ctr/Carr School)	282,240	431,600	149,360	53%
Oak Hill MS	620,228	759,716	139,488	22%
Newton Education Center	746,029	860,414	114,385	15%
Countryside ES	203,786	281,022	77,236	38%
Angier Elementary School (NEW)	474,312	550,008	75,696	16%
Police Department Headquarters	383,628	430,956	47,328	12%
EV Charging Stations	13,594	55,112	41,518	305%
Auburndale Library	7,047	41,759	34,712	493%
Franklin ES	215,836	246,235	30,399	14%
Bowen ES	212,760	240,360	27,600	13%
Underwood ES	135,301	162,176	26,875	20%
C C Burr ES	158,848	185,531	26,683	17%
FD #3 and HQ New	476,400	502,685	26,285	6%
Lincoln Elliot (formerly Aquinas School)	248,400	273,240	24,840	10%
Mason-Rice ES	232,440	255,600	23,160	10%
Peirce ES	128,040	149,560	21,520	17%
90 Crafts St	64,508	85,520	21,012	33%
Newton City Hall	606,400	594,000	(12,400)	-2%
Police Headquarters Garage	57,710	43,392	(14,318)	-25%
110 Crafts St- Garage/Stable	176,520	159,480	(17,040)	-10%
Newton Senior Center	111,360	84,520	(26,840)	-24%
Bigelow MS	400,800	351,600	(49,200)	-12%
74 Elliot Street - Operations Center (Water/Utilities)	122,480	67,240	(55,240)	-45%
F A Day MS	1,210,228	1,067,794	(142,434)	-12%
Newton North HS (2010)	3,907,887	3,540,695	(367,192)	-9%
Newton South HS	2,947,714	2,436,101	(511,613)	-17%



	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Gas (therms)	1442381	1513016	1579870	1368288	1677089	1504288

# Natural Gas -Change in therm use

Facility	Fuel (units)	FY 2019		FY 2022		Change	
		Use	Use	Use	therms	therms	%
Bowen ES	Gas (therms)	46,981	70,656	23675	50%		
Main Library	Gas (therms)	33,883	49,718	15835	47%		
Oak Hill MS	Gas (therms)	41,900	50,396	8496	20%		
Mason-Rice ES	Gas (therms)	26,323	33,986	7663	29%		
Franklin ES	Gas (therms)	57,609	64,530	6921	12%		
John Ward ES	Gas (therms)	45,626	52,253	6627	15%		
C C Burr ES	Gas (therms)	17,097	21,471	4374	26%		
Angier Elementray School (NEW)	Gas (therms)	25,082	20,485	-4597	-18%		
Countryside ES	Gas (therms)	45,647	39,930	-5717	-13%		
Zervas New School	Gas (therms)	20,370	13,582	-6788	-33%		
Memorial Spaulding ES	Gas (therms)	61,245	52,398	-8847	-14%		
Newton South HS	Gas (therms)	178,840	164,090	-14750	-8%		
Bigelow MS	Gas (therms)	55,407	40,513	-14894	-27%		
Charles E Brown MS	Gas (therms)	152,552	125,302	-27250	-18%		
Newton North HS (2010)	Gas (therms)	179,368	141,908	-37460	-21%		
New Cabot School	Gas (therms)	61,618	23,852	-37766	-61%		

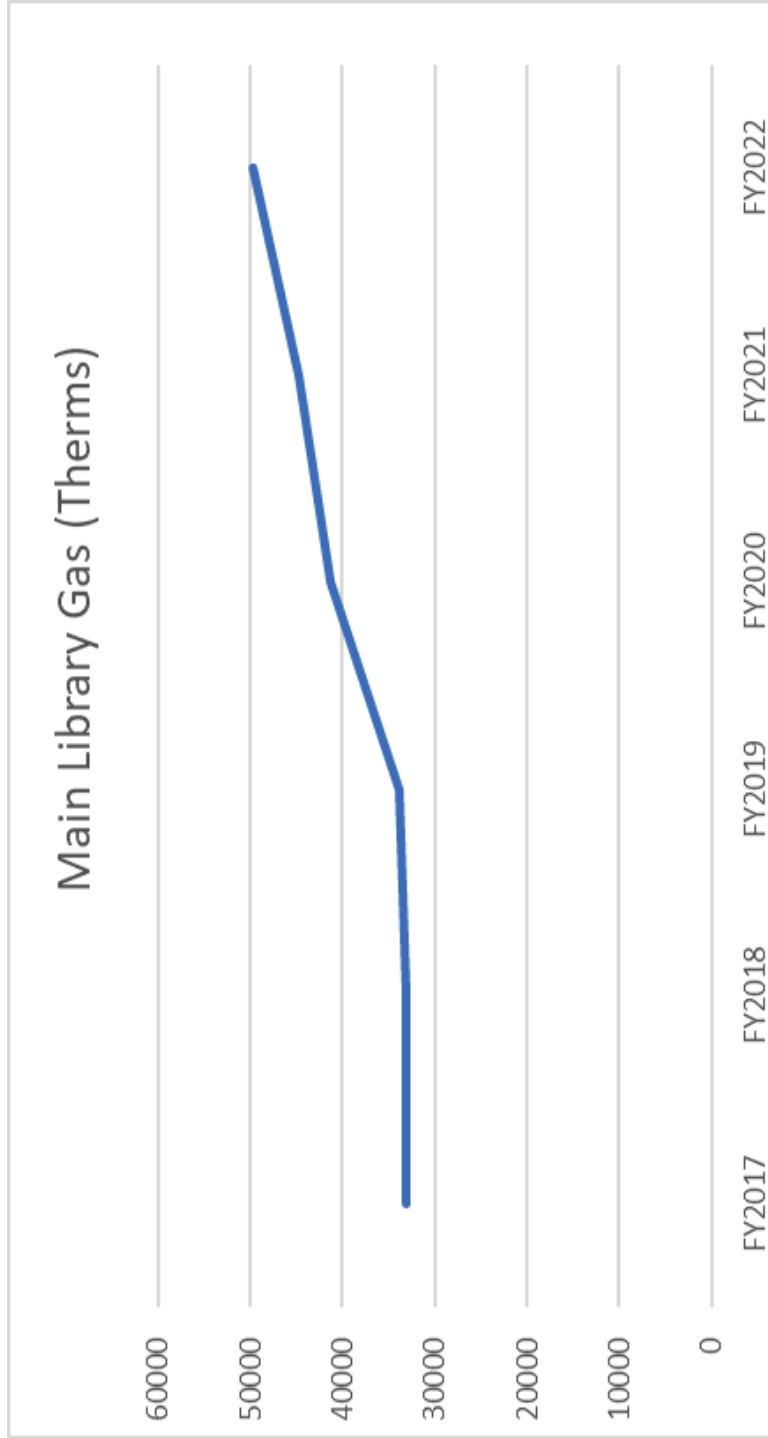


FY	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
N Gas (Therms)	723,203	836,899	1,232,457	1,341,240	1,040,524	1,263,525	1,507,969	1,667,039	1,312,175	1,442,381	1,526,114	1,676,224
Htg Oil (gals)	744,052	571,139	176,201	189,119	159,659	128,924	78,218	60,337	32,546	67,230	75,043	76,621
HDDs	5465	5743	5171	5683	4526	5476	5966	6107	4925	5359	5493	5354



FY17	FY18	FY19	FY20	FY21	FY22
876,320	839,940	856,360	1,024,840	1,285,300	1,169,889





	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
Gas (therms)	33,020	33,019	33,883	41,396	44,831	49,718

# FY 23 Main Library kWh Use and Cost

Library FY21 -FY23 use and cost							
		FY21	FY22	FY23 thru Dec.			
		kWh	kWh		\$		\$/kWh
8-2022	SOLAR		200,729	188,316	\$16,058	\$15,062	\$ 0.08
2630394100	Electric (kWh)	1,285,300	376,740		\$34,674		
3071427001	Electric (kWh)		592,420	661,229	\$53,883	\$134,462	\$ 0.20
	TOTAL	1,285,300	1,169,889	849,545	\$104,616	\$149,524	
				<b>Solar:</b>			
							22% of kWh
							10% of cost

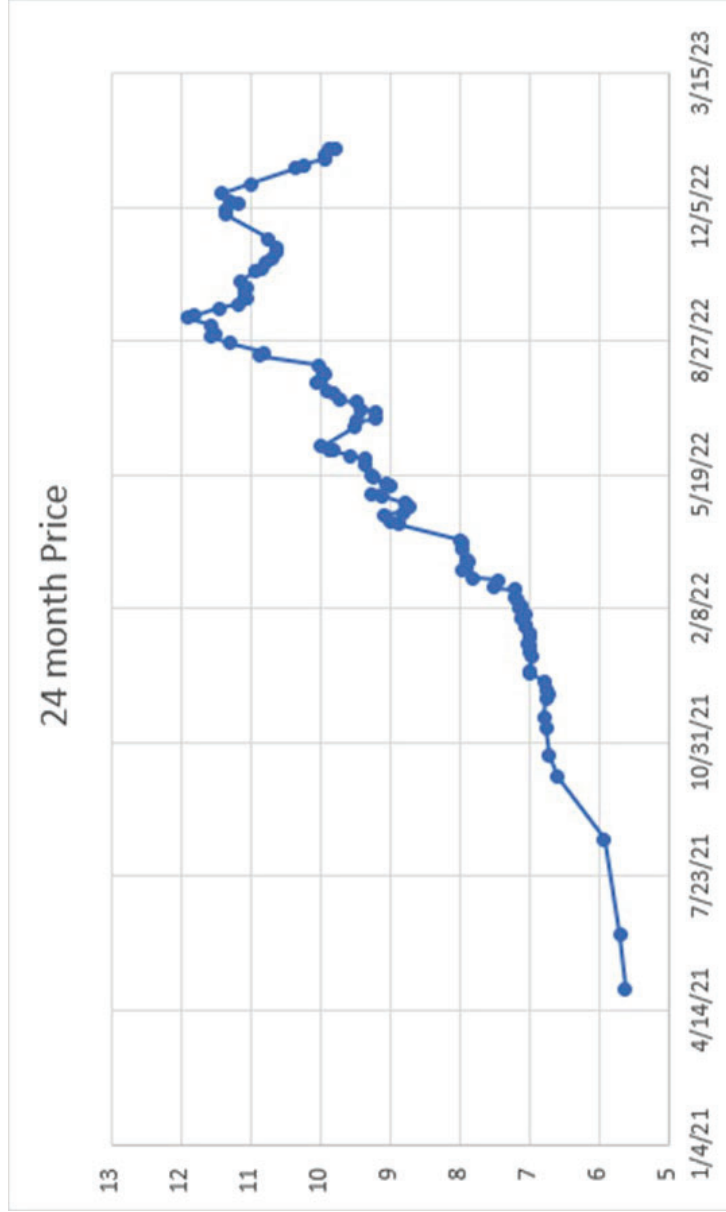
Electricity Contract-Cost Savings Compared to Eversource Basic Service						
		use in kWh	Eversource Supply rate \$/kWh	Newton supply rate\$/kWh	Savings per kWh	Savings \$
Small Bus. B2	July-Dec. 2022	4,333,138	\$ 0.18	\$ 0.09	\$ 0.09	\$ 368,750
	Jan.-June 2023	5,350,000	\$ 0.26	\$ 0.09	\$ 0.17	\$ 899,335
Large Bus. B7	July-Sept. 2022	2,562,682	\$ 0.22	\$ 0.09	\$ 0.13	\$ 323,154
	Oct.-Dec. 2022	2,379,681	\$ 0.31	\$ 0.09	\$ 0.21	\$ 507,110
	Jan.-March 2023	2,617,000	\$ 0.40	\$ 0.09	\$ 0.31	\$ 801,064
	estimated April-June 2023	2,816,824	\$ 0.18	\$ 0.09	\$ 0.09	\$ 239,712
<b>TOTAL SAVINGS</b>						<b>\$ 3,139,125</b>
B7=(NHS,SHS,Library,FA Day, Police HQ,Oak Hill, Angier, Zervas, Cabot)						

Gas Contract - Natural Gas Savings						
Period	NGrid supply rate \$/therm	Newton supply rate \$/therm	Savings \$/therm	use in therms	Savings	
July 1-July 31, 2022	\$ 1.04	\$ 0.53	\$ 0.51	4,054	\$ 2,068	
Aug 1-Aug 31,2022	\$ 0.67	\$ 0.53	\$ 0.14	3,406	\$ 477	
Sept 1 -Oct. 31, 2022	\$ 1.03	\$ 0.53	\$ 0.50	9,995	\$ 4,998	
Nov 1-Nov 30, 2022	\$ 1.04	\$ 0.53	\$ 0.51	74,679	\$ 38,086	
Dec 1,2022-Jan 31, 2023	\$ 0.99	\$ 0.53	\$ 0.46	498,997	\$ 228,042	
Feb 1, 2023-Apr 30, 2023	\$ 0.89	\$ 0.53	\$ 0.36	797,182	\$ 286,986	
May 1,2023-Apr 30, 2023	\$ 0.67	\$ 0.53	\$ 0.14	115,975	\$ 16,237	
				<b>TOTAL SAVINGS</b>	<b>\$ 576,892</b>	

# Energy Supply Contracts

- Natural Gas Contract: Mass OSD (Operational Services Division)  
Nov. 1, 2019- Oct. 31, 2023 @ \$.539/therm  
Extension: Nov. 1, 2023- Oct. 31, 2025 @ \$.98/therm
- Electricity Contract: Energy Broker (Freedom Energy Logistics)  
Nov. 1, 2020-Nov. 30, 2024 @ \$.0929/kWh  
Jan. 1, 2023- Clean Energy Standard bump to \$.0945/kWh
- RECs Contract: Energy Broker FEL  
Jan. 1, 2021-Dec. 31, 2024 @ \$38.50/REC  
2,100 RECs cost \$80,850 per year

# OSD Price Tracking



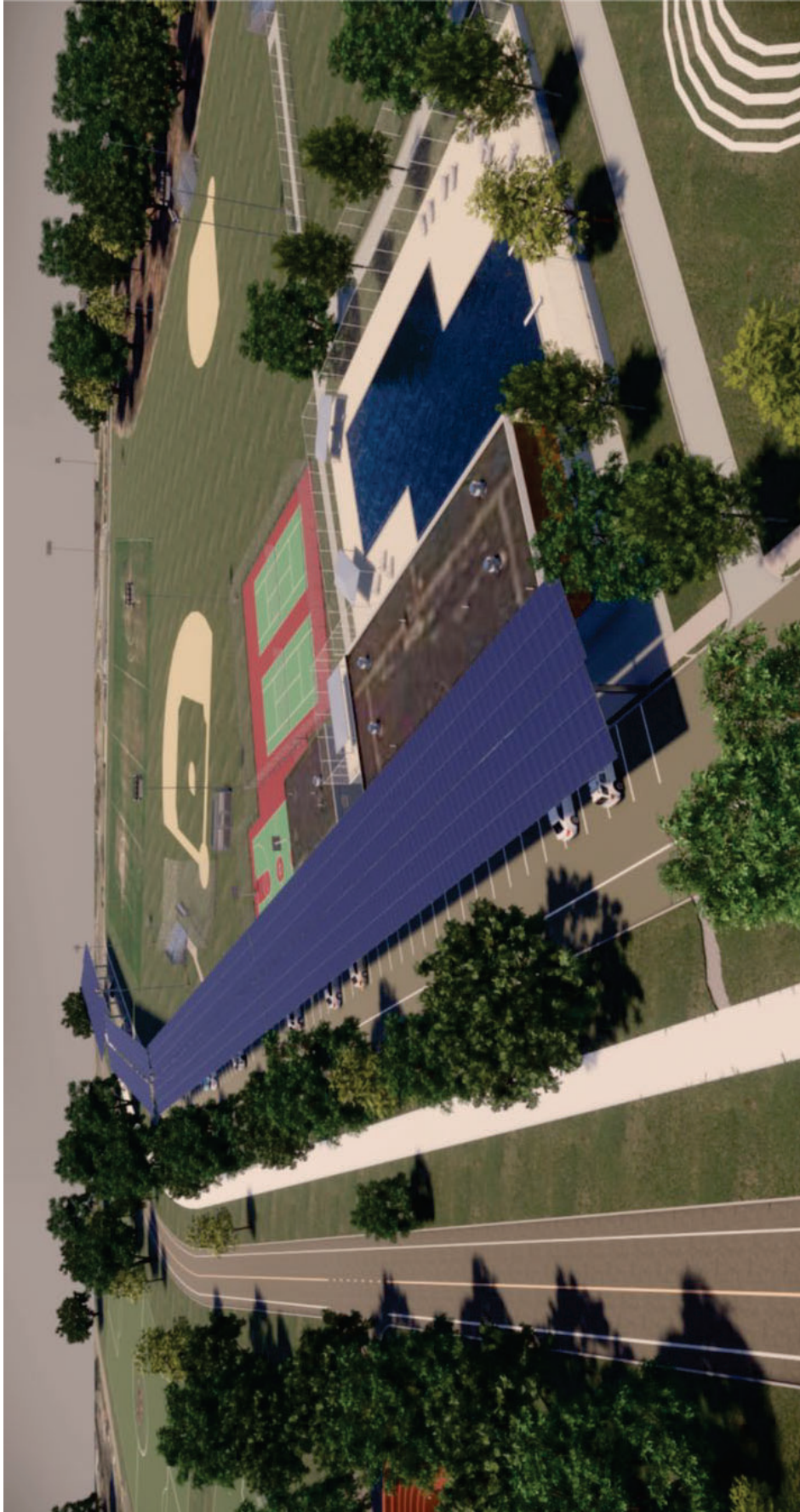
<b>Solar Project Savings Phases 1 and 2 and 3</b>				rev. 5.31.23	
<b>FY 2018</b>	Total NMC	Cost	Net Savings	kWh	
Phase 1	\$ 128,403	\$ 68,892	\$ 59,511	622,475	
Phase 2	\$ 291,413	\$ 168,455	\$ 122,958	1,097,129	
Rumford	\$ 621,819	\$ 249,986	\$ 371,833	2,396,870	
<b>FY 2019</b>	Total NMC	Cost	Net Savings	kWh	
Phase 1	\$ 160,297	\$ 78,295	\$ 82,002	734,813	
Phase 2	\$ 353,129	\$ 185,365	\$ 167,764	1,169,869	
Rumford	\$ 713,204	\$ 255,209	\$ 457,995	2,518,530	
<b>FY 2020</b>	Total NMC	Cost	Net Savings	kWh	
Phase 1	\$ 158,293	\$ 89,316	\$ 68,977	761,117	
Phase 2	\$ 343,346	\$ 217,035	\$ 126,311	1,330,357	
Rumford	\$ 727,677	\$ 343,725	\$ 383,952	2,843,120	
<b>FY 2021</b>	Total NMC	Cost	Net Savings	kWh	
Phase 1	\$ 141,917	\$ 75,985	\$ 65,932	729,053	
Phase 2	\$ 337,595	\$ 210,356	\$ 127,239	1,285,919	
Rumford	\$ 681,699	\$ 336,374	\$ 345,325	2,650,900	
Phase 3	\$ 31,614	\$ 31,614	\$ 51,800	395,150	
<b>FY 2022-actual</b>	Total NMC	Cost	Net Savings	kWh	
Phase 1	\$ 135,910	\$ 86,775	\$ 49,135	731,066	
Phase 2	\$ 375,597	\$ 213,945	\$ 161,652	1,273,322	
Rumford	\$ 787,758	\$ 341,632	\$ 446,126	2,667,579	
Phase 3	\$ 115,493	\$ 115,493	\$ 115,493	1,062,742	
<b>FY 2023-estimated</b>	Total NMC	Cost	Net Savings	kWh	
Phase 1	\$ 206,308	\$ 89,378	\$ 116,929	736,813	
Phase 2	\$ 419,690	\$ 218,224	\$ 201,466	1,311,530	
Rumford	\$ 901,306	\$ 349,964	\$ 551,342	2,650,900	
Phase 3	\$ 154,000	\$ 154,000	\$ 138,000	1,579,017	
<b>Total</b>	\$ 1,527,303	\$ 811,566	\$ 1,007,738	6,278,260	

Phase 3 Solar - Update June 15, 2023									
Completed									
In progress									
		Total First Year Output (kWh)	KW (AC)	KW (DC)	Location	Type	Solar Company	Estimated Construction Timeline	SMART Application Approved
<b>Roof Sites</b>									
1	Ed Center roof, 100 Walnut St.	95,779	67	81	Roof	BTM	Ameresco	completed	
2	Fire Station #3 and Headquarters, 31 Willow Street	77,395	67	63	Roof	BTM	Ameresco	completed	
3	Zervas Elementary School, 30 Beethoven Ave	216,094	133	182	Roof	BTM	Ameresco	completed	
4	Angier Elementary School Gym roof, 1697 Beacon St	98,208	73	88	Roof	BTM	Ameresco	fall 2024	6/21/2023
5	Cabot, 229 Cabot School	142,409	109	122	Roof	BTM	Ameresco	fall 2024	5/16/2023
5	Carr School, 225, Nevada Street	66,161	50	57	Roof	BTM	Solsect	fall 2024	5/16/2023
7	Williams Elementary School, 141 Grove Street	87,835	59	68	Roof	BTM	Solsect	fall 2024	6/13/2023
	Total Phase 3 Roof sites kWh	783,881	558						
<b>Parking Lot Canopy Sites</b>									
8	Education Center parking lot, 100 Walnut St. (Crafts St side)	335,119	216	284	Parking lot	FTM	Ameresco	TBD	5/16/2023
9	Oak Hill MS parking lot, 130 Wheeler Road, behind Oak Hill Middle School	197,117	136	150	Parking lot	BTM	Solsect	TBD	6/13/2023
10	Memorial Spaulding Elementary School parking lot, 250 Brookline Ave	204,698	146	182	Parking lot	FTM	Ameresco	TBD	5/16/2023
11	26-28 Pleasant Street lot, Newton Centre	120,656	100	108	Parking lot	FTM	Ameresco	TBD	6/13/2023
12	Mason Rice Elementary School Parking lot, 149 Pleasant Street	200,824			Parking lot	BTM	Solsect	TBD	
13	North High School, Lowell Ave	582,786	360	492	Parking lot	FTM	Ameresco	completed	
14	North High School, Walnut Street	354,392	220	267	Parking lot	BTM	Ameresco	completed	
15	Brown Middle School Lot (behind school) 125 Meadowbrook Road	321,338	216	277	Parking lot	FTM	Ameresco	TBD	
16	Wheeler Road lot, corner of Meadowbrook Road and Wheeler Road	313,500	220	270	Parking lot	FTM	Ameresco	TBD	
17	Newton Free Library, 330 Homer Street	378,230	240	347	Parking lot	BTM	Ameresco	completed	
	Total Phase 3 Canopy sites kWh	3,008,660	1,854						
<b>Phases</b>									
		Annual kWh							Municipal Use
	Phase 3 Total kWh-completed, estimated FY 2022 kWh	1,704,676							9%
	Phase 3 Total kWh-proposed	2,087,865							10%
	Phase 2 Total kWh-actual FY 2021 kWh	3,933,819							20%
	Phase 1 Total kWh-actual FY 2021 kWh	736,813							4%
	All Phases kWh	8,463,173							42.2%
	Municipal Total Use kWh FY 2021	20,044,000							



# Solar Phase 4

- New schools and new roofs:
  - Lincoln Eliot School renovation
  - Bigelow new roof
  - Countryside School
  - Franklin School
- Parking lot Canopies:
  - Revisit Phase 3 canopies at Auburndale Cove and Albermarle

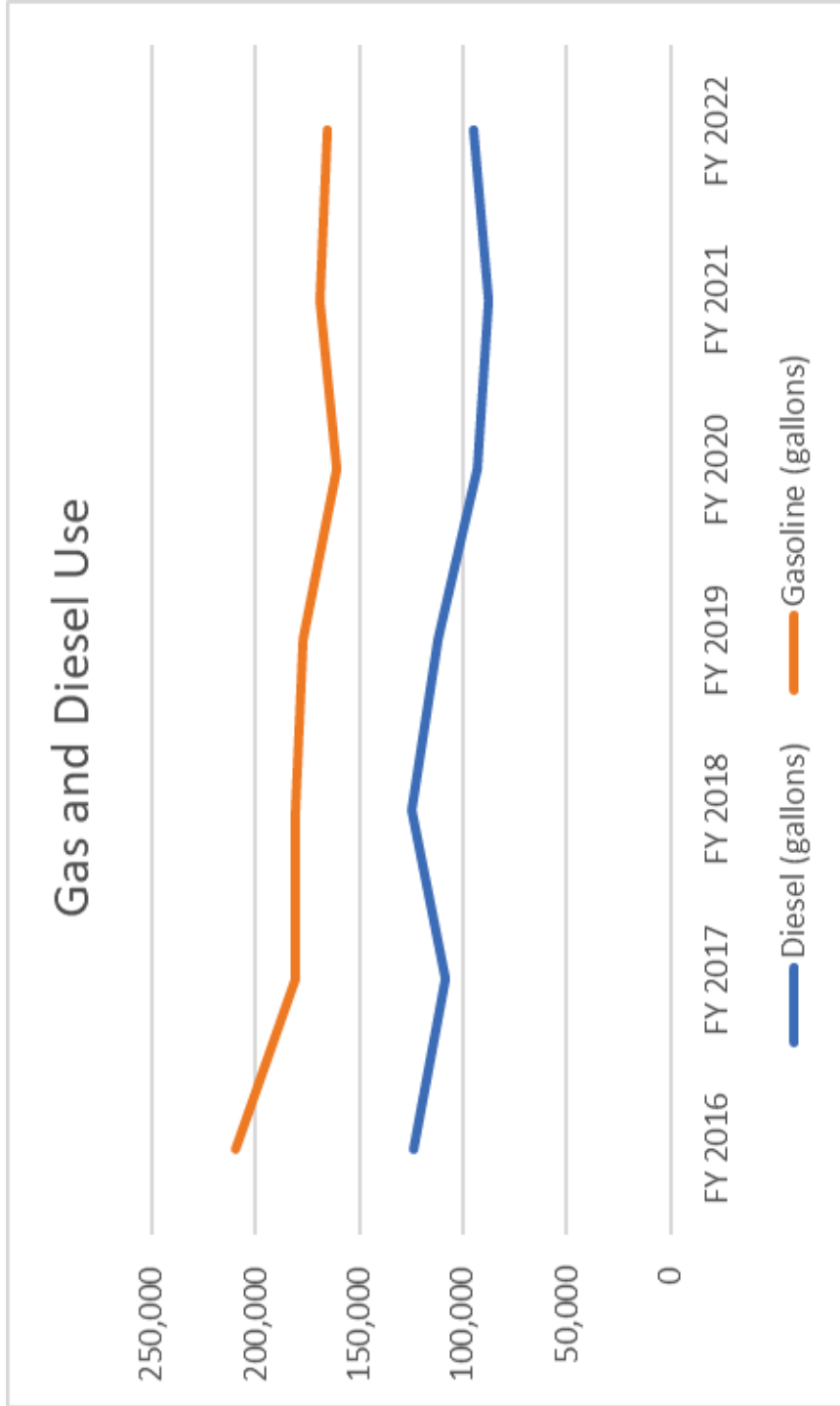




2/27/2023		Request		Annual Cost Savings		
2022 Green Communities Grant		City Energy Stabilization Funds		Annual Cost Savings		
	Total Project Cost	Green Comm. Grant	Utility Rebates	City Funds	City Energy Stabilization Funds	Annual Cost Savings
South High School LED lighting and controls-Goodwin	\$ 99,232.00	\$ 50,000.00	\$ 27,520.00		\$ 21,712.00	\$ 12,897.00
Fire Station #1-insulation	\$ 8,090.00	\$ 2,093.00	\$ 1,005.00		\$ 5,000.00	\$ 838.00
Fire Station #1-weatherstripping	\$ 4,500.00	\$ 1,912.00	\$ 1,011.00		\$ 1,577.00	\$ 843.00
Fire Station #1- T-stats and control valves	\$ 12,800.00	\$ 6,544.00	\$ 1,256.00		\$ 5,000.00	\$ 1,046.00
Fire Station #1- Hyper Heat Pumps	\$ 96,550.00	\$ 39,451.00	\$ 17,500.00	\$ 39,599.00		\$ (1,204.00)
<b>Total</b>	<b>\$ 221,172.00</b>	<b>\$ 100,000.00</b>	<b>\$ 48,292.00</b>	<b>\$ 33,289.00</b>	<b>\$ 14,420.00</b>	

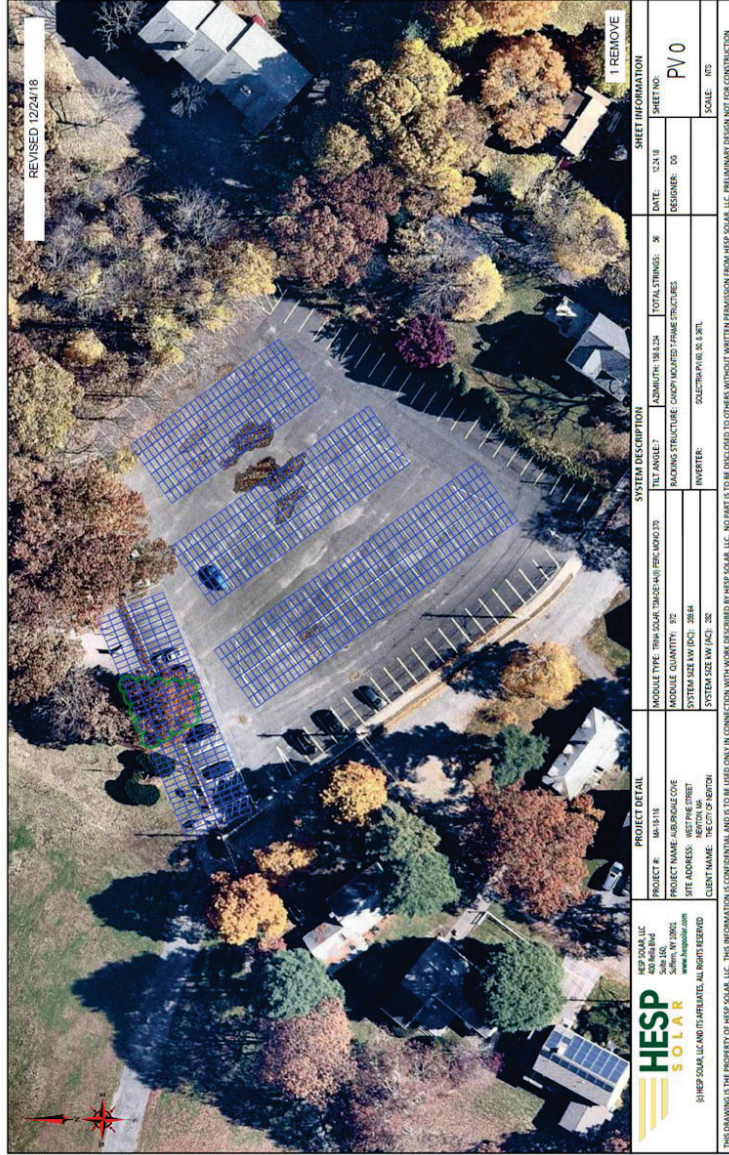
# Grants and Rebates

Category	Total to Date	latest
Green Communities Grants since 2010	\$ 1,783,486	\$ 100,000
Utility Rebates to date since 2013	\$ 2,458,466	\$ 48,292
Demand Response payments since 2017	\$ 236,494	\$ 42,017
EV Charger grants since 2018	\$ 49,000	\$ 28,000
Grand Total	\$ 4,527,446	\$ 218,309



	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Fuel (units)	Use	Use	Use	Use	Use	Use	Use
Diesel (gallons)	123,698	108,715	125,150	112,345	93,546	87,696	94,702
Gasoline (gallons)	209,277	181,229	180,927	177,057	161,154	168,764	165,404

# Auburndale Cove



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	<b>PROJECT INFORMATION</b> TOTAL STRING : 56 INVERTER : SOLAECOR PA 60.0L 3-PT.		TOTAL STRING : 56 INVERTER : SOLAECOR PA 60.0L 3-PT.		DATE : 03/18/16 SHEET NO. : P/0 DESIGNER : DO SCALE : NTS	

