

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.

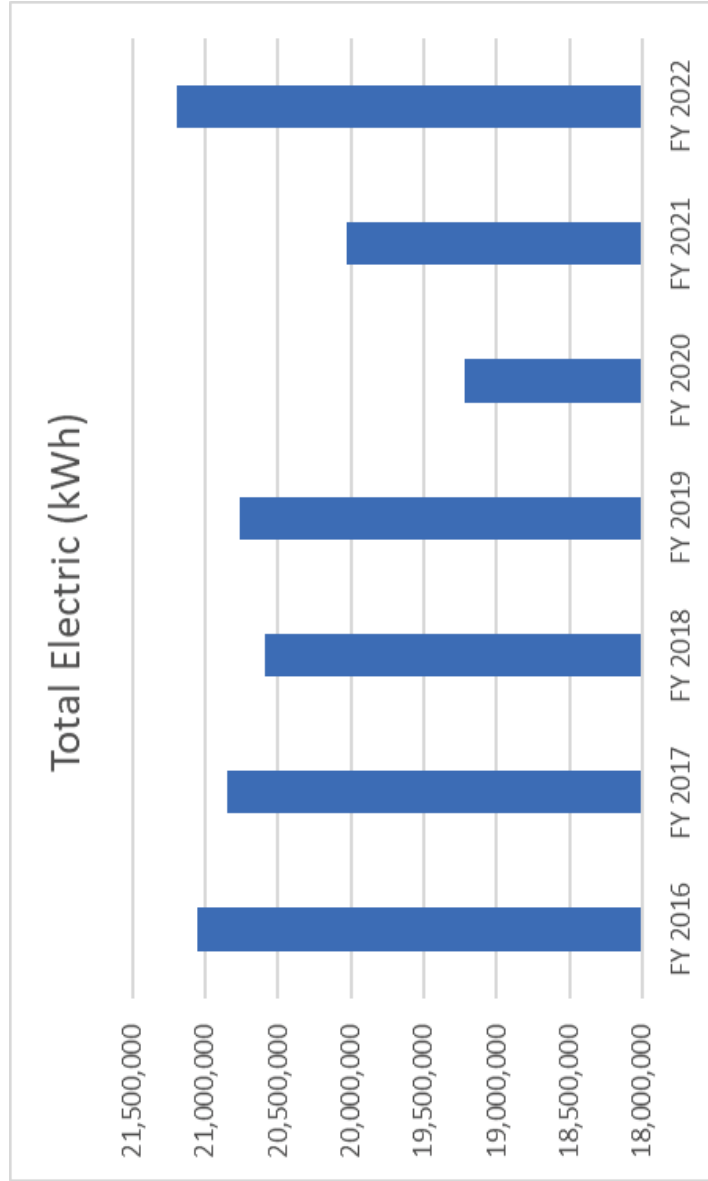
Please contact your Regional Coordinator for assistance if you use a different energy-tracking tool.

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

FY

Table 2: Timeline of Annual Municipal Energy Use

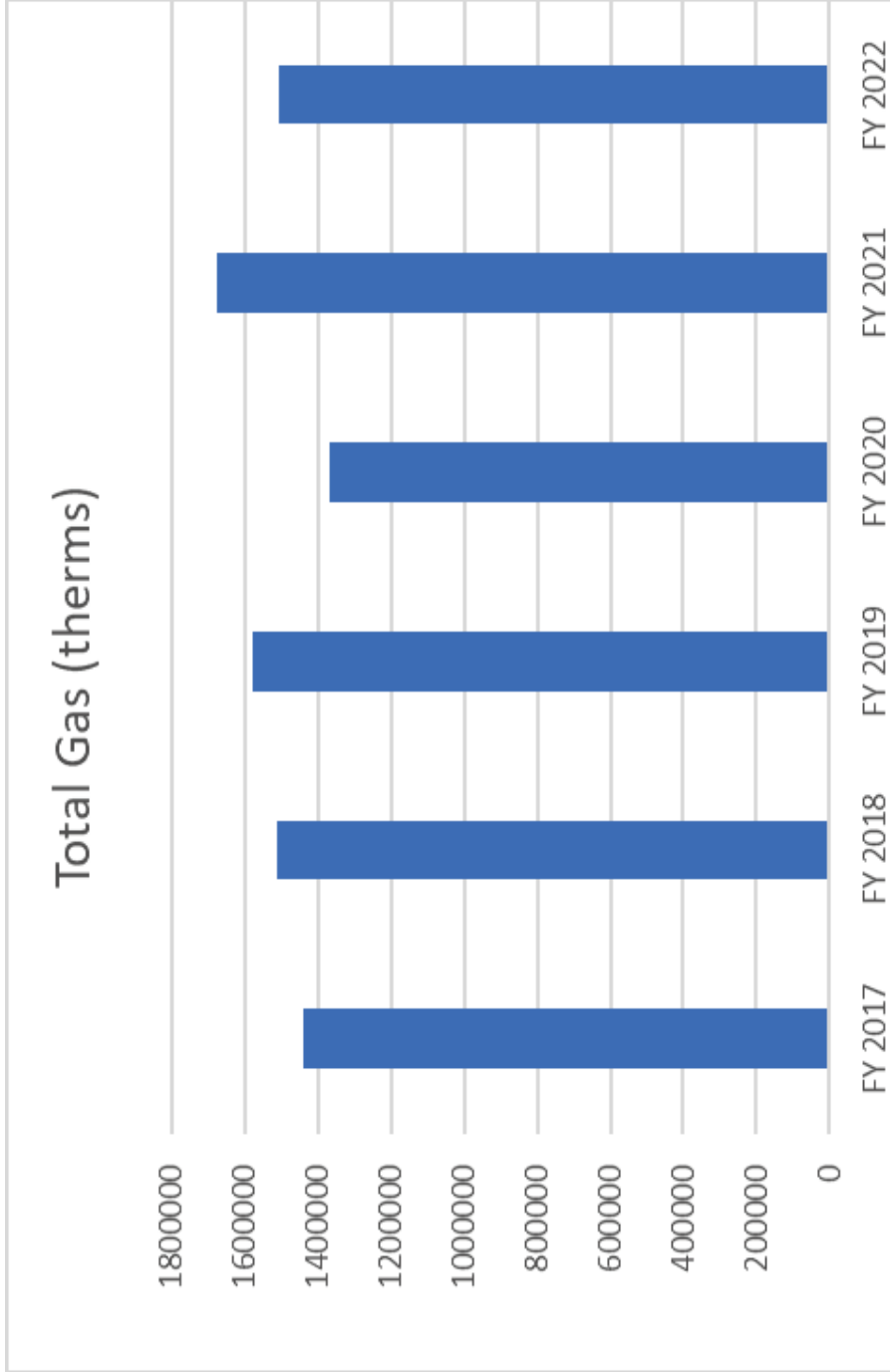
| Category | Baseline | | | | For Most Recent Year: Change vs. Baseline (%) |
|--|------------|------------|------------|------------|---|
| | MMBtu 2008 | MMBtu 2020 | MMBtu 2021 | MMBtu 2022 | |
| Null | | | | | Enter baseline year consumption in column D |
| Buildings | 245,870 | | | 217,906 | -11.4% |
| 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% |
| Adjustments | | | | | |
| <i>Building Stock Change [see previous tab]</i> | | | | (6,567) | |
| <i>Regional School [see Crit 3 - Overview tab for information Regional School %]</i> | | | | | |
| TOTAL ENERGY CONSUMPTION (No Weather Normalization) | 299,831 | - | - | 254,502 | -15.1% |
| Weather Normalized Consumption [see instructions above] | 303,211 | | | 271,329 | -10.5% |
| Adjustments | | | | | |
| <i>Building Stock Change (weather normalized)</i> | | | | (6,731) | |
| <i>Regional School (weather normalized)</i> | | | | | |
| TOTAL ENERGY CONSUMPTION (Weather Normalized) | 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

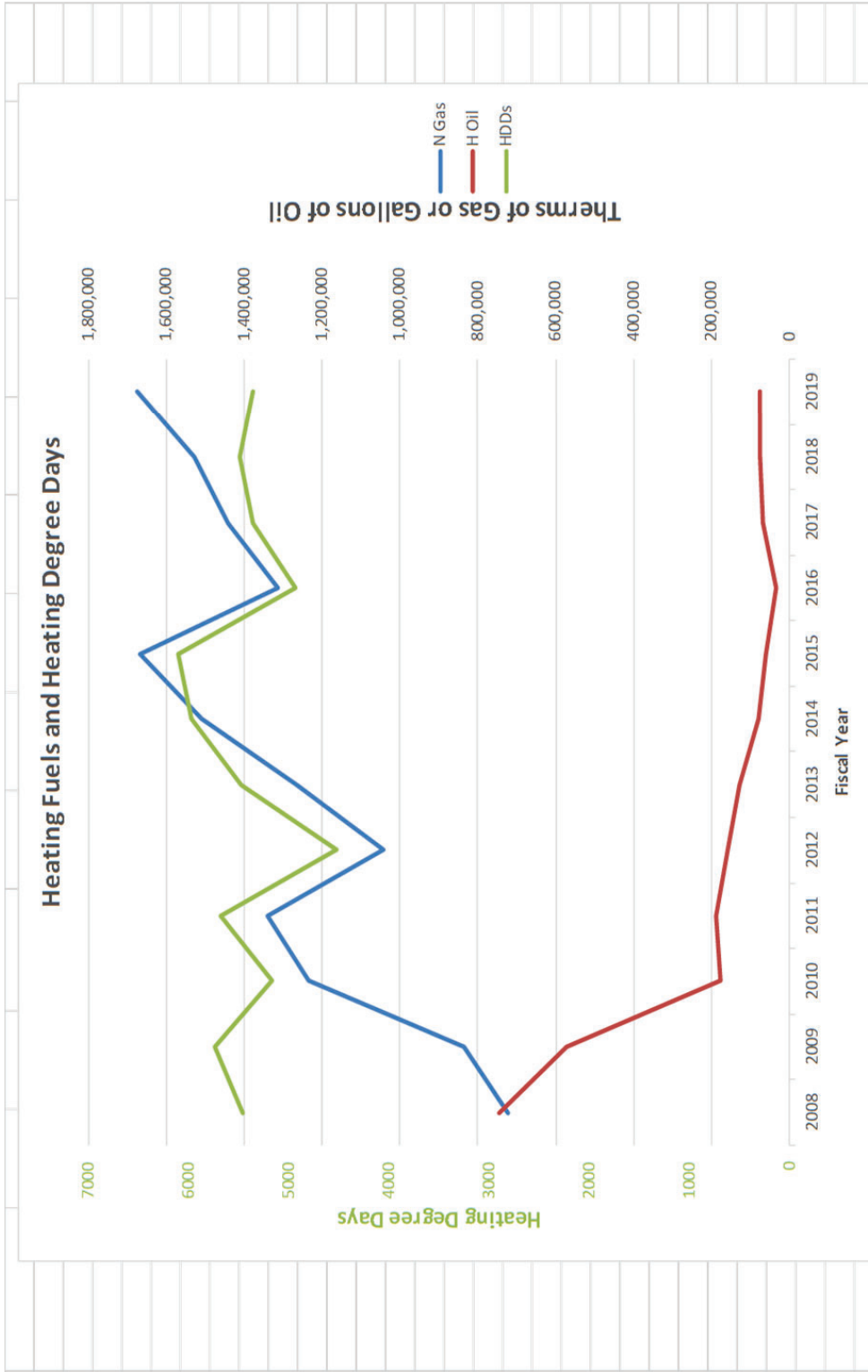
| | FY 2019 | FY 2022 | kWh change | % Change |
|--|-----------|-----------|------------|----------|
| Main Library | 856,360 | 1,169,889 | 313,529 | 37% |
| Horace Mann (formerly Newton Cultural Ctr/Carr School) | 282,240 | 431,600 | 149,360 | 53% |
| Oak Hill MS | 620,228 | 759,716 | 139,488 | 22% |
| 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% |



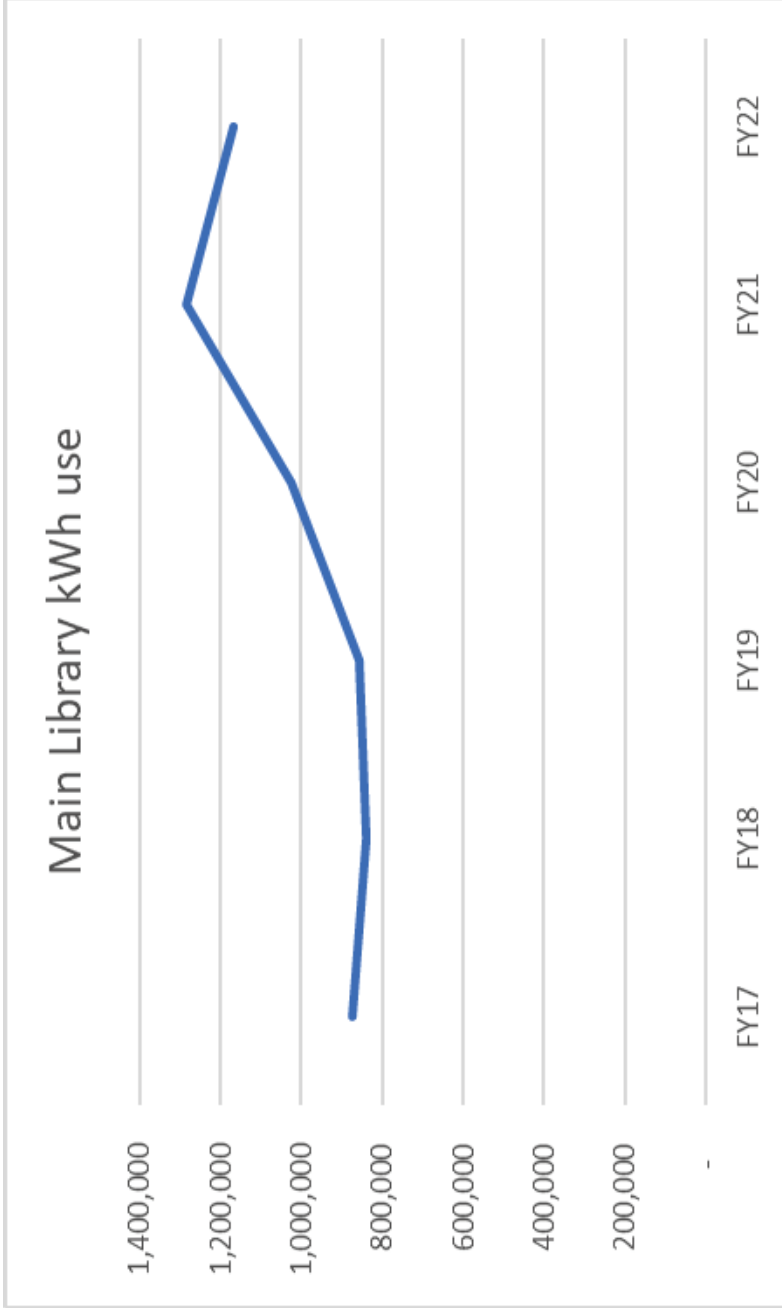
| | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 |
|--------------|---------|---------|---------|---------|---------|---------|
| Gas (therms) | 1442381 | 1513016 | 1579870 | 1368288 | 1677089 | 1504288 |

Natural Gas -Change in therm use

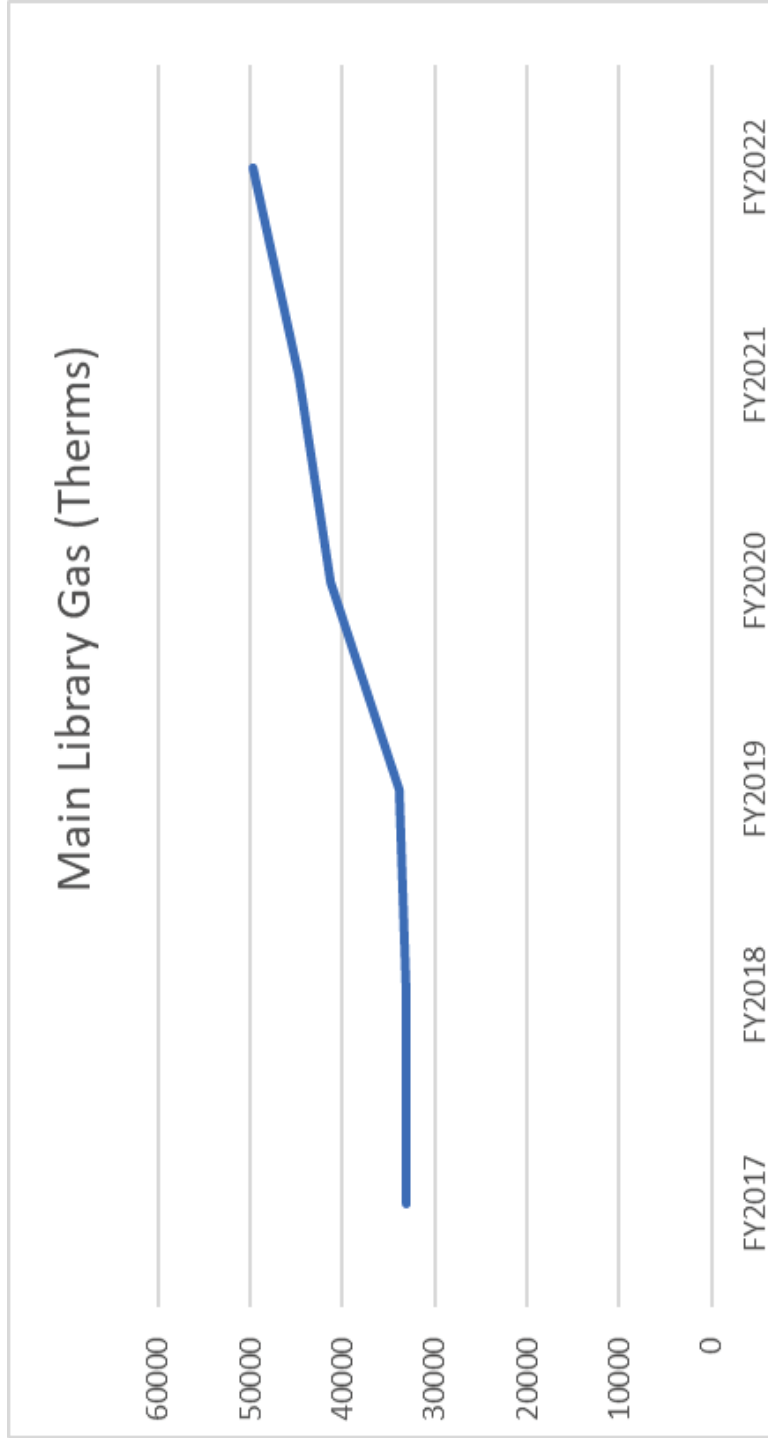
| Facility | Fuel (units) | FY 2019 | | FY 2022 | | Change | |
|--------------------------------|--------------|---------|---------|---------|--------|--------|---|
| | | Use | Use | Use | therms | therms | % |
| Bowen ES | Gas (therms) | 46,981 | 70,656 | 23675 | 50% | | |
| Main Library | Gas (therms) | 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 |

| 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 | |
| | | | | TOTAL SAVINGS | \$ 576,892 | |

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

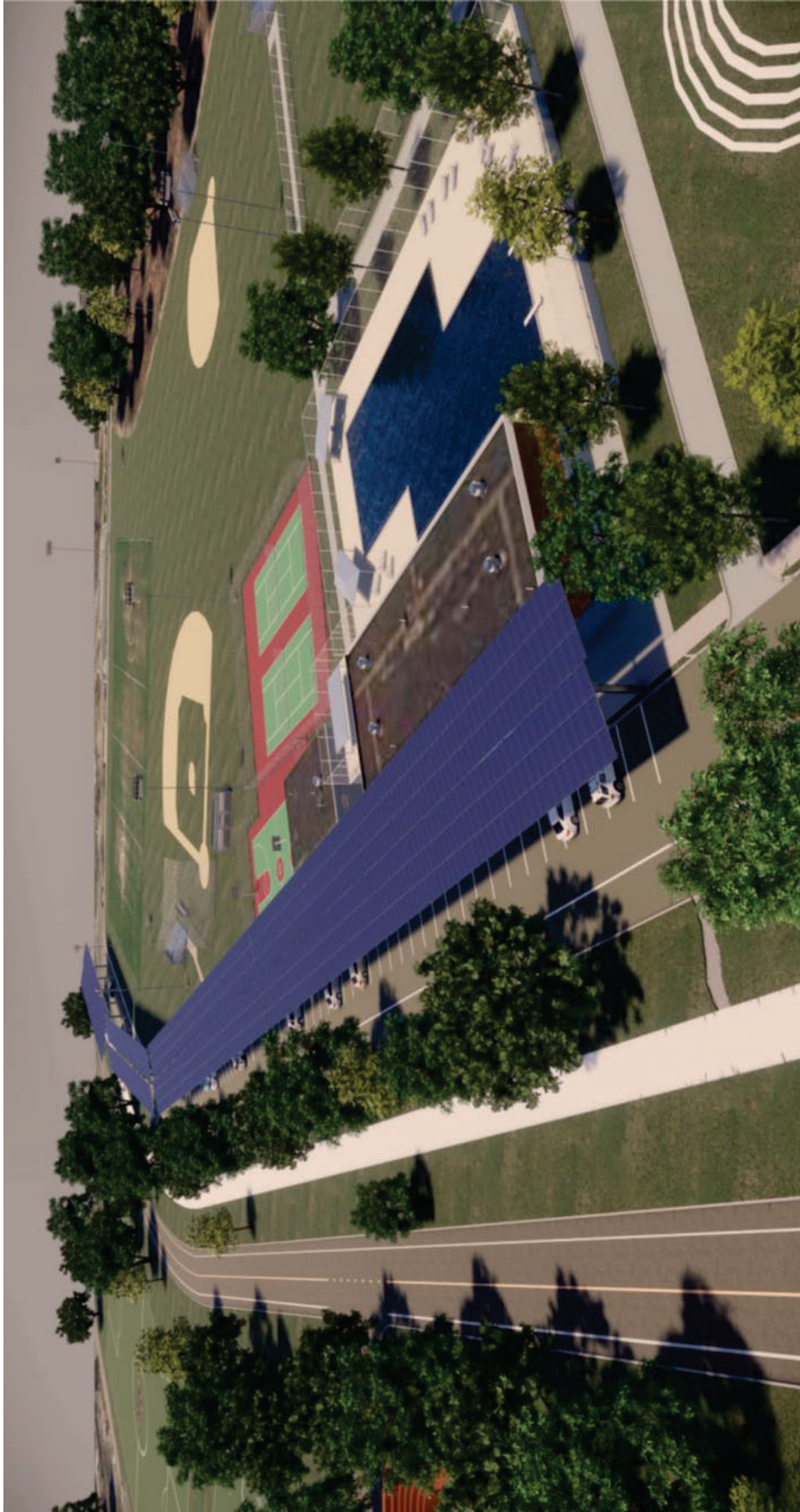


| Solar Project Savings Phases 1 and 2 and 3 | | | | rev. 5.31.23 |
|---|--------------|------------|--------------|--------------|
| FY 2018 | Total NMC | Cost | Net Savings | kWh |
| Phase 1 | \$ 128,403 | \$ 68,892 | \$ 59,511 | 622,475 |
| Phase 2 | \$ 291,413 | \$ 168,455 | \$ 122,958 | 1,097,129 |
| Rumford | \$ 621,819 | \$ 249,986 | \$ 371,833 | 2,396,870 |
| FY 2019 | 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 |
| FY 2020 | 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 |
| FY 2021 | 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 |
| FY 2022-actual | 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 | \$ 1,299,265 | \$ 642,352 | \$ 115,493 | 1,062,742 |
| FY 2023-estimated | 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 |
| Total | \$ 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 |
| Roof Sites | | | | | | | | | |
| 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 | | | | | | |
| Parking Lot Canopy Sites | | | | | | | | | |
| 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 | | | | | | |
| Phases | | | | | | | | | |
| | | 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

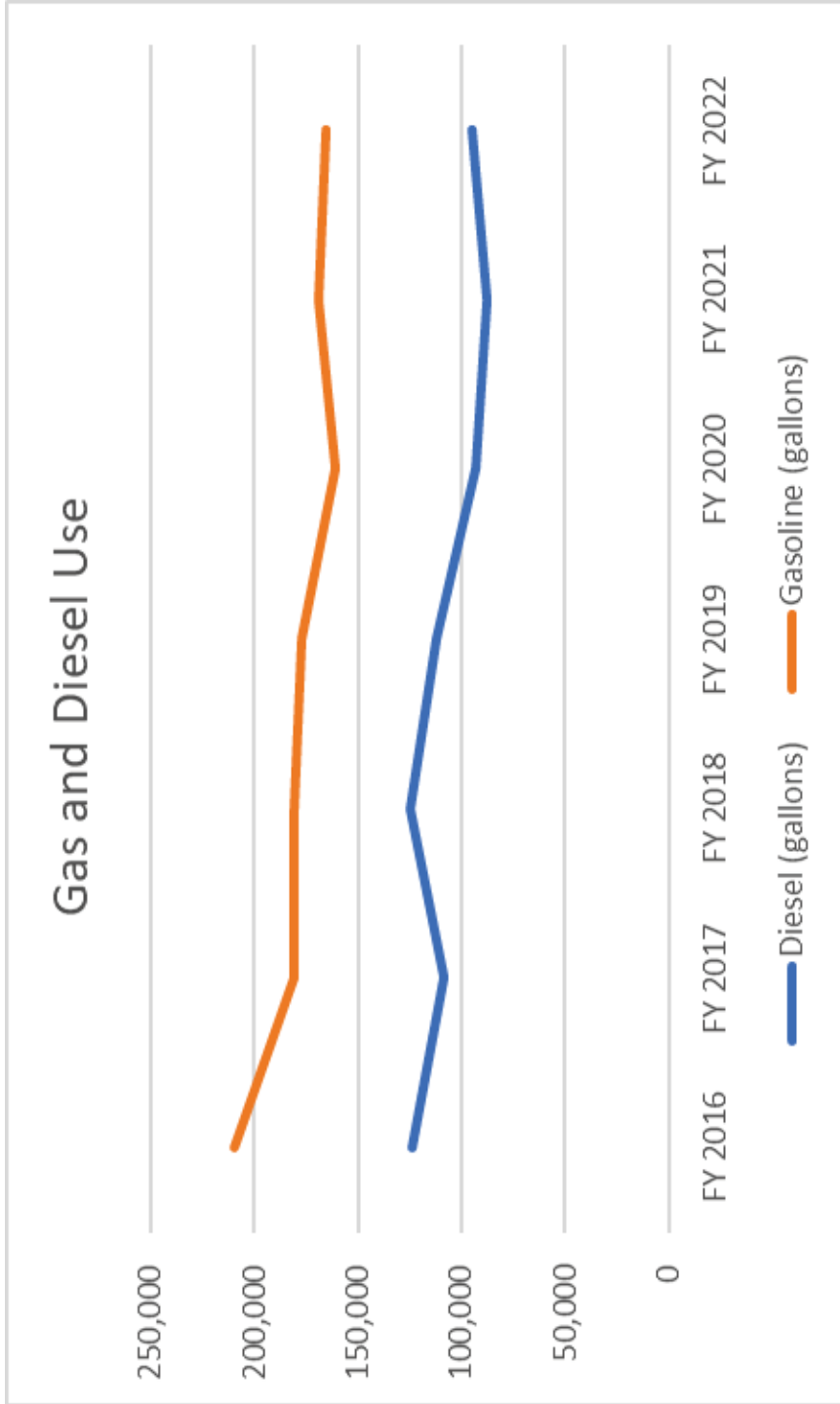




| 2/27/2023 | | Request | | Request | | Request | |
|---|--------------------|---------------------------------|-----------------|---------------------------------|---------------------------------|---------------------------------|---------------------|
| 2022 Green Communities Grant | | City Energy Stabilization Funds | | City Energy Stabilization Funds | | City Energy Stabilization Funds | |
| | Total Project Cost | Green Comm. Grant | Utility Rebates | City Funds | City Energy Stabilization 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) |
| Total | \$ 221,172.00 | \$ 100,000.00 | \$ 48,292.00 | | \$ | \$ 33,289.00 | \$ 14,420.00 |

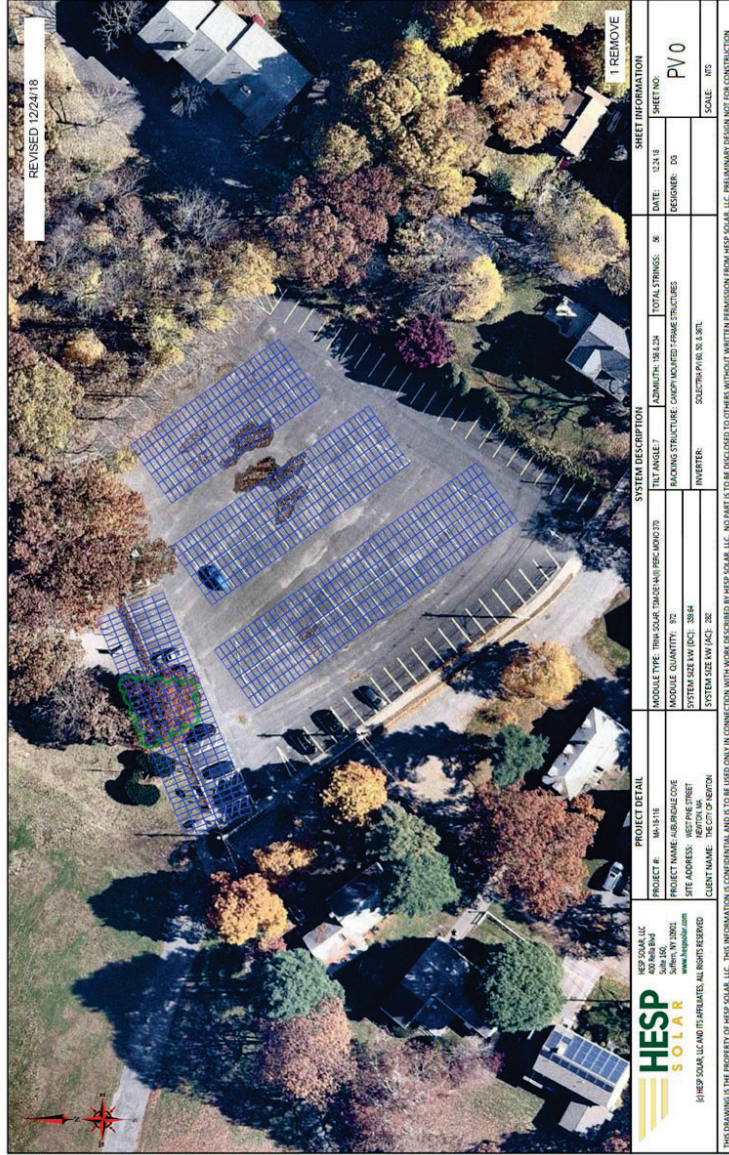
Grants and Rebates

| 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



REMOVED

| | | | | | | |
|--|---|--|---|--|--|--|
| <p>HESP SOLAR, LLC 401 ADA BLVD SUITE 100 ROSELAND, NJ 07068 www.hespsolar.com</p> <p>© HESP SOLAR, LLC AND ITS AFFILIATES. ALL RIGHTS RESERVED</p> <p>THIS DRAWING IS THE PROPERTY OF HESP SOLAR, LLC. THIS INFORMATION IS CONFIDENTIAL AND IS TO BE USED ONLY IN CONNECTION WITH WORK DESCRIBED BY HESP SOLAR, LLC. NO PART IS TO BE DISCLOSED TO OTHERS WITHOUT WRITTEN PERMISSION FROM HESP SOLAR, LLC. PRELIMINARY DESIGN NOT FOR CONSTRUCTION.</p> | PROJECT DETAIL PROJECT # : 18-01516 PROJECT NAME : AUBURNDALE COVE SITE ADDRESS : AUBURNDALE STREET CLIENT NAME : THE CITY OF BOSTON | | SYSTEM DESCRIPTION MODULE TYPE : TRIPOLAR THIN FILM PERKINS 275 MODULE QUANTITY : 292 SYSTEM SIZE (KW DC) : 28.84 SYSTEM SIZE (KW AC) : 28 | | SHEET INFORMATION DATE : 03/24/18 SHEET NO. : P/0 DESIGNER : DO SCALE : NTS | |
| | PROJECT DETAIL PROJECT # : 18-01516 PROJECT NAME : AUBURNDALE COVE SITE ADDRESS : AUBURNDALE STREET CLIENT NAME : THE CITY OF BOSTON | | SYSTEM DESCRIPTION TOTAL STRING : 56 INVERTER : SOLAIX PAH 60.3L 3PH | | SHEET INFORMATION DATE : 03/24/18 SHEET NO. : P/0 DESIGNER : DO SCALE : NTS | |

