



# Capital Refurbishment Plans

## FY2025-27

Draft as of 4/2/2024

# Chenery Upper Elementary

- Year Voted: November 1994
- Year Opened: September 1997
- Years Operating: 27
- Square Feet: 182,000

# Known Projects

1. Natural Gas Boilers – 6 banks of 5 boilers (30 total) designed to fire as needed to provide heat for entire building, primarily classrooms.
  - Same make, model, and factory – When one fails, anticipate ripple effect.
2. Rooftop HVAC Units – 17 units in all; 9 units provide both heat and AC for common areas; 8 provide only heat, no AC. The heat is sourced from the boilers in the basement. Each unit has 4 compressors but can operate on 2. Most have had some intervention to keep them running and are down to 2 compressors. Only have 2-3 years left.
3. Roof – Facilities has been actively patching leaks for several years. Need to plan for replacement within 2-3 years.

# School Project Window is Limited

- Schools close mid-June, reopen early September → ten weeks
- Must have vendors lined up and all materials available to squeeze project into available construction window to minimize impact on learning time.

Working Plan for replacements –

FY2025	Replace Boilers	ATM – June 2024
FY2026	Rooftop HVAC Units	ATM – June 2025
FY2027	Roof replacement	ATM – June 2025

# Electrification – Residential vs. School

- Individual homeowners who have converted to all-electric have experienced the various changes needed – update electric panel, replace heating unit, retrofit/install new room units, etc. These can be expensive.
- The same is true for school buildings, but on a much larger scale.
- Individual home conversions do not have the same impact on the grid as a project for an entire school.
- Converting a building as large as the Chenery to electric will require at least tripling electric service to the building.
- Updating service means installing transformers, and Belmont Light reports a 12-15 month lead time for such orders.

# Green Community

- The Commonwealth of Massachusetts has a goal of transitioning away from fossil fuels by 2050. This is recognized as a stretch goal which acknowledges the urgency around climate change.
- The MA Dept. of Energy Resources (DOER) has been developing policies and programs to support this goal. This includes a new Climate Leaders program that is being unveiled this Spring.
- It is well-documented that it is more cost-effective to incorporate energy efficiency strategies into new buildings than to retrofit existing buildings, particularly those designed 30 years ago.
- Belmont adopted a Climate Action Plan and new buildings have followed an all-electric model.
- Much has also been done to make current buildings more energy-efficient, including replacing gas boilers with more energy-efficient models.

# Chenery Heating/Cooling Source Summary

Unit Type	Heat Source	AC?	Service Location
Uninvents (85)	Boilers	No	Classrooms
Rooftop Units (8) – Heat only	Boilers	No	Hallways
Rooftop Units (9) – both AC and Heat	Boilers	Yes	Offices, Auditorium, Cafeteria/Kitchen, Library
Ductless Mini splits (4)	Mini split	Yes	IDF Rooms and LABBB Room 212

The boilers provide heat for the entire building using 102 individual units both in individual classrooms and via rooftop units fed from the boilers. If the heat source is changed, that would involve retrofitting or changing each unit – not a small task.

# Chenery Boiler Options

In 2023, Facilities commissioned a study to review options to replace the Chenery Boilers.

Results are to the right. Capital are estimates to construct; Operating is the anticipated budget impact using current utility rates.

#	Description	Capital	Operating
1	High-Efficiency Gas Boilers	\$1,600,000	Similar to current
2	Electric Boilers	\$1,965,000	\$465K > current
3	Central Air Source Heat Pumps	\$11,200,000	\$127K > current
4	Central Ground Source Heat Pumps	\$12,600,000	\$113K > current
5	Hybrid Air-to-Water VRF	N/A	
6A	Air-to-Air Heat Pumps w/ Local Water Coils	\$8,300,000	\$113K > current
6B	Air-to-Air Heat Pumps w/ Local Electric Backup	\$8,525,000	\$190K > current
7	Ground Coupled Water-to-Air Heat Pumps	\$16,930,000	\$104K > current

- More energy efficient gas boilers are cheapest for both capital and operating, for now.
- Next option is electric boilers, but operating costs are higher by \$465,000 per year. Limited capacity to add solar onsite to offset additional electric demand.
- Other options are more costly and would require more extensive disruptions to classrooms which would take longer than the 10-week summer construction window.

# Chenery HVAC Units and Roof

- \$200K request at 2024 Annual Town Meeting to more fully design options for the 17 rooftop units and the 75,000 square foot roof. Expected to refine capital request for FY2026.
- Potential opportunity for converting one or more rooftop units from gas to electric – will review as part of design.
  - Gas available as backup
  - If rooftop unit heat runs off electric, would reduce demand for natural gas consumption.
  - Would likely require greater Belmont Light support to building, but longer lead time would support transition.
- Staff reviewing potential MSBA grant opportunity that may become available in January 2025 for either the rooftop units, the roof, or both. (Grant in development – details unknown until 2025.)

# 2024 Annual Town Meeting Request

- \$1.6M request for Chenery gas boiler replacement –
  - Goal is to accomplish before the rooftop units and the roof – those are connected to the boiler, so makes most sense to replace boilers first
  - Risk failure of heating units if wait, others can't be pushed off any longer

Project	ATM	Order Equipment	Lead Time	Install
Boilers	2024 - \$1.6M	Sept. 2024	6-9 months	Summer 2025
Design – Roof & Rooftop Units	2024 - \$200K			
Rooftop Units	2025 - \$3M+	Sept. 2025	6-9 months	Summer 2026
Roof	2025 - \$3M+	TBD	TBD	Summer 2027