



### Rochester Museum & Science Center – Genesee Community Charter School

#### Building Owner:

Rochester Museum and Science Center

#### Region:

Finger Lakes

#### Number of Buildings:

2

#### FlexTech Consultant:

EMCOR Services Bellem

#### Sector:

PreK-12 School

#### Square Footage:

51,007 sq.ft.

#### Pre-COVID Condition:

- Filters: MERV 8 filters, washable mesh filters in the variable refrigerant flow systems (VRF)
- Ventilation:
  - Ster-1: makeup air unit that serves the VRF LG ceiling cassettes, operated at 10% outside air but assumed capable of 100% outside air, assumed 24/7 operation
  - AC-1: makeup air unit not currently in use, but assumed operational and intended for 24/7 operation with 10% outside air
  - AHU-1: assumed 24/7 operation with 10% outside air serving water source heat pumps
  - ERV-1: 100% outside air makeup air unit with energy recovery ventilation
  - Rez-1 and Rez-2: 100% outside air constant volume makeup air units with energy recovery ventilation that serve VRF Mitsubishi ceiling cassettes, operating 24 hours a day, seven days a week—nine exhaust fans in operation during occupied hours
- Outside Air: 5840 CFM total; mix of 100% and 10% outside air

### Study Overview

NYSERDA funded this energy efficiency indoor air quality study that identified the energy use associated with the ASHRAE Epidemic Task Force (ETF) Building Readiness guidance<sup>1</sup> HVAC-related measures aimed at preventing the risk of COVID-19 infection that are feasible at the building. Additionally, the study investigated alternate opportunities that were more energy efficient, yet equally risk adverse from an indoor air quality perspective, as the ASHRAE guidance measures.

### Measures Evaluated

| Measure Name  | Measure Status  | Electric Savings (kWh) | Fossil Fuel Savings (MMBtu) | Energy Cost Savings (\$) | Measure Cost (\$) |
|---|-----------------|------------------------|-----------------------------|--------------------------|-------------------|
| <b>ASHRAE Epidemic Task Force (ETF) Guidelines Measures Evaluated</b> |                 |                        |                             |                          |                   |
| Maintain Humidity at 40%-60%  | Not Recommended | -90                    | 0.0                         | -\$10.72                 | \$162,188         |
| Portable HEPA Units in all Classrooms                                 | Not Recommended | -50,768                | 0.0                         | -\$6,047.58              | \$77,500          |
| Upgrading MERV 8 Filters to MERV 13                                   | Recommended     | -1,821                 | 0.0                         | -\$215.85                | \$421             |
| Flush Cycle   | Recommended     | 9,998                  | -579.1                      | -\$1,857.04              | \$1,200           |
| 100% Outside Air During Occupied Hours                                | Recommended     | -42,557                | -1,592.5                    | -\$13,451.52             | \$1,200           |
| Run Bathroom Exhaust Fans 100%  | Recommended     | -3,322                 | 0.0                         | -\$395.72                | \$300             |
| Totals:   |                 | -37,702                | -2,171.6                    | -\$15,920.13             | \$3,121           |
| <b>Energy Efficiency Package Measures Evaluated</b>                   |                 |                        |                             |                          |                   |
| In-Duct UVGI  | Not Recommended | -6,784                 | 0.0                         | -\$808.12                | \$0               |
| In-Duct UVGI with Reduced Outside Air                                 | Not Recommended | 34,871                 | 131.5                       | \$4,845.85               | \$10,623          |
| Upper-Room UVGI   | Not Recommended | -25,324                | 0.0                         | -\$3,016.64              | \$0               |
| Upper-Room UVGI in Place of HEPA Units                                | Not Recommended | 42,370                 | 0.0                         | \$5,047.20               | \$73,574          |
| Recommended Measures Totals:  |                 | 0                      | 0                           | 0                        | 0                 |

- All energy use and energy cost values are presented on an annual basis
- Negative values represent increased use/cost
- The Energy Efficiency Package Measure savings are presented with the ASHRAE ETF Guidelines Measures Totals as the baseline

<sup>1</sup> The ASHRAE ETF guidance used for this study was based on one or more of the following document versions: Building Readiness v.5-21-2020, Commercial v.4-20-2020, Schools & Universities v. 5-5-2020, Healthcare v. 6-17-2020, Filtration & Disinfection v. 5-27-2020, ERV Practical Guide v. 6-9-2020

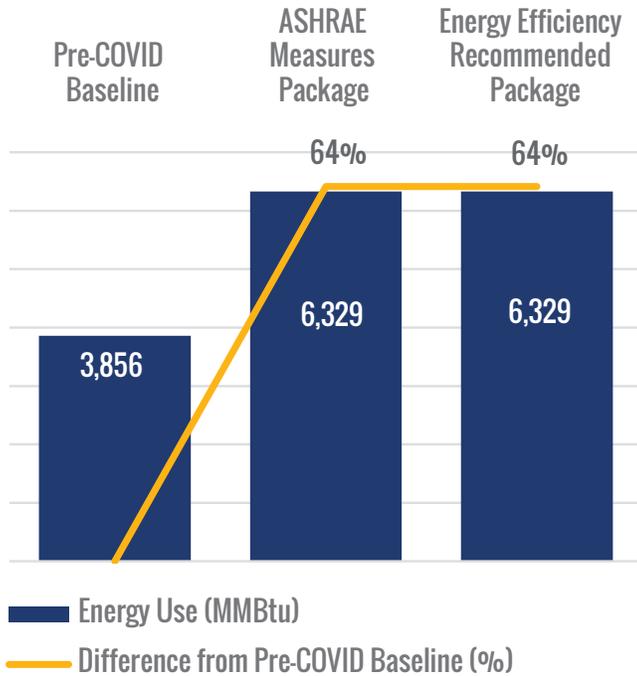


## Key Notes

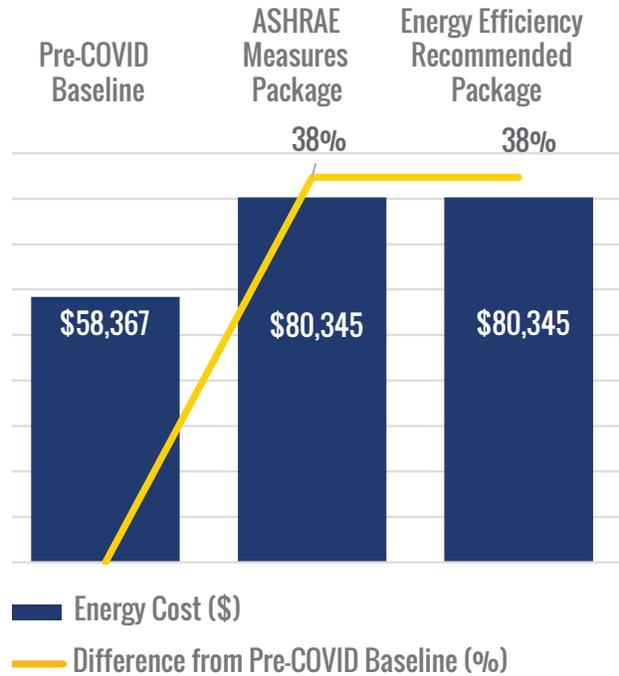
The high annual maintenance needs and costs of UVGI products are much more cost-prohibitive in general over ASHRAE measures, such as adjusting outside air levels and installing higher MERV filters.

## Impact Results

Energy Use Impacts



Energy Cost Impacts



## The NYSERDA Flexible Technical Assistance (FlexTech) Program

Through the FlexTech Program, NYSERDA provides cost-sharing for objective, site-specific, and targeted studies on how to best implement clean energy and energy efficient technologies. A NYSERDA-approved FlexTech Consultant will work with customers to complete an energy study and provide expert, customized services and information.

See the results of other Energy Efficient Indoor Air Quality Pilot Studies. Visit [nyserderda.ny.gov/FlexTech/IAQ](https://nyserderda.ny.gov/FlexTech/IAQ)

NYSERDA nor any of its contractors, including FlexTech consultants, are responsible for assuring that the design, engineering and construction of the project is proper or complies with any particular laws (including patent laws), codes, or industry standards. NYSERDA does not make any representations of any kind regarding the results to be achieved by the Project or the adequacy or safety of such measures. NYSERDA does not endorse, guarantee, or warrant any particular manufacturer or product, and NYSERDA provides no warranties, expressed or implied for any product of service.