FlexTech IAQ

Indoor Air Quality

Rochester Museum & Science Center - Science Museum

Building Owner:
Rochester Museum & Science Center

Region: Finger Lakes

Number of Buildings: 1

FlexTech Consultant:
EMCOR Services Betlem

Sector:
Museum

Square Footage:
129,880 sq.ft.

Pre-COVID Condition:

- Filters: MERV13
- Ventilation: Five operational supply air fans (SAF), two return air fans, nine operational exhaust air fans, and five rooftop units that serve multiple spaces on the top floors. Two of the SAFs have no return air. Three of the SAFs supply water-source heat pumps.
- Outside Air: 20%; SAFs: 15%

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[1] 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 ($)	Measure Cost ($)
ASHRAE Epidemic Task Force (ETF) Guidelines Measures Evaluated					
Flush Cycle	Not Recommended	-10,617	-114	-$1,642	$0
100% OA During Occupied Hours	Not Recommended	-29,797	-763	-$7,002	$0
Portable HEPA Units in Select Areas	Not Recommended	-36,598	0	-$3,536	$25,000
Totals:		-77,012	-877	-$12,180	$25,000
Energy Efficiency Package Measures Evaluated					
Install UVGI on SAF-1 & 2 and Back off Flush	Recommended	4,094	0	-$1,139	$4,766
Install UVGI on RTUs 1-5 and Back off Flush	Recommended	3,302	463	$1,660	$4,742
Install UVGI on SAF-4 Heat Pumps	Recommended	-2,619	0	-$1,941	$7,448
Totals:		4,777	463	-$1,420	$16,956

- *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*

[1] *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*

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Key Notes

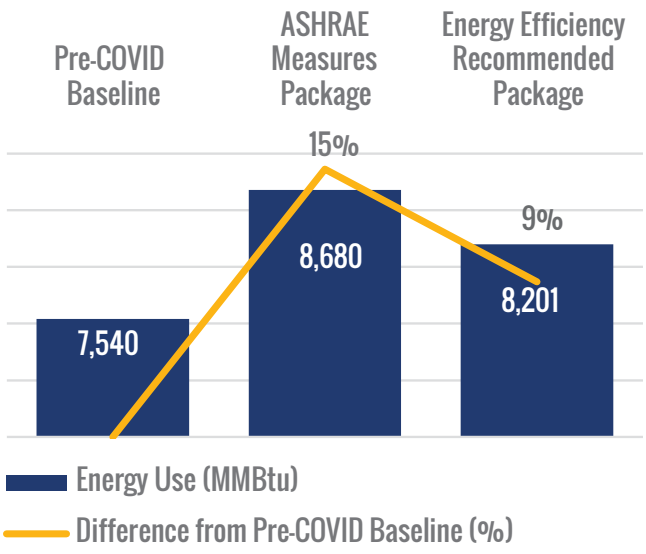
By installing ultraviolet germicidal irradiation (UVGI) on the rooftop units, maximized outdoor air ventilation levels during occupied times and the flush cycle time can be reduced.

On SAF-1 and SAF-2, it is not possible to reduce the maximum outdoor air ventilation levels as a result of installing UVGI as this would cause the return air to bypass HP-1 for SAF-1 and HP-70 for SAF-2 and eliminate exposing air to the UVGI system. In fact, operating the SAF-1 and 2 units at maximum outdoor air in conjunction with UVGI installation is recommended to meet code requirements. Additionally, by installing UVGI on SAF-1 and SAF-2, a shorter flush cycle and forgoing portable HEPA air scrubbers in common spaces can be accomplished.

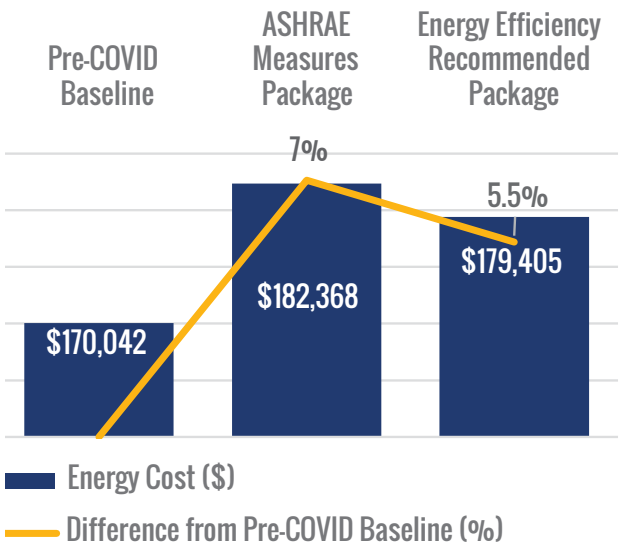
Outdoor air ventilation is not provided to the spaces served by SAF-4; therefore, the UVGI installation serves as a less expensive mechanism to provide clean air compared to implementing make-up air unit(s).

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 nyserda.ny.gov/FlexTech/IAQ

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