

Pre-K to 12 Private School

High School Building



About the School

Founded in 1952, this non-profit private day school is located on an urban campus. Enrollment from Pre-K through Grade 12 is over 1,200. Providing an exceptional education, the school prides itself in being a vibrant community center for its students and their families.

The Challenge

Faced with high HVAC energy consumption for cooling, the Pre-K to 12 school set out to improve its energy efficiency. Large amounts of outside air were being brought in to reduce carbon dioxide (CO₂) levels, resulting in higher energy costs and with the dangerous side effect of dramatically increasing indoor levels of PM_{2.5} from the highly trafficked roads near the school.

It is generally accepted that high levels of air pollution and CO₂ impacts cognitive functions and student performance.^{1,2} The school expressed the desire to improve indoor air quality (IAQ) while reducing HVAC energy usage and turned to enVerid Systems for help.



Figure 1: The four-story High School Building has approximately 26,370 ft² of classroom space.

Solution

Using ASHRAE Standard 62.1 Indoor Air Quality Procedure (IAQP) in combination with HVAC Load Reduction® (HLR®) technology to clean indoor air, the school was able to significantly reduce outside air intake and energy consumption.

Customer: K-12 Private School

Climate Zone: 1B

Deployed: 2016

Industry: Education

Enrollment: 1,270

Challenges: Reduce HVAC energy consumption and intake of outdoor pollution while still maintaining low CO₂ concentrations in the high school.

Solution: Two enVerid HLR 1000E rooftop modules to scrub indoor air of molecular contaminants (CO₂, VOCs, aldehydes) enabling reduction in outside air ventilation required.

Results:

- **33% reduction in total HVAC energy consumption**
- **52% average reduction in outside air (Using ASHRAE 62.1 IAQP with HLR vs VRP)**
- **Reduced intake of outdoor pollution**
- Extended particulate filter life
- Improved indoor air quality
- Eliminated overhead of ERV system

¹ Chang, Zivin, Gross and Neidell, National Bureau of Economic Research, 2016

² Allen et al., Harvard School of Public Health, 2015

Two HLR modules covered all classrooms within the building. A slip stream of the building's return air ducted through the HLR modules removed all molecular contaminants and then returned clean air to the supply. Additionally, enVerid HLR modules monitor indoor air quality and environmental comfort in the school.

Maintained Indoor Air Quality and Less Intake of Outdoor Pollution

Healthy CO₂ levels below 1,000 ppm are maintained even though the building uses 52% less outside airflow when HLR modules are operating. Less outside air reduces the intake of outdoor pollution.

Energy Recovery Ventilation (ERV) No Longer Necessary

HLR technology enables outside air reduction, a feature not available with ERV systems, because it provides IAQ management for all contaminants. As a result, the school is using the HLR modules to control the outside air dampers, bypassing the ERV system that is no longer required.

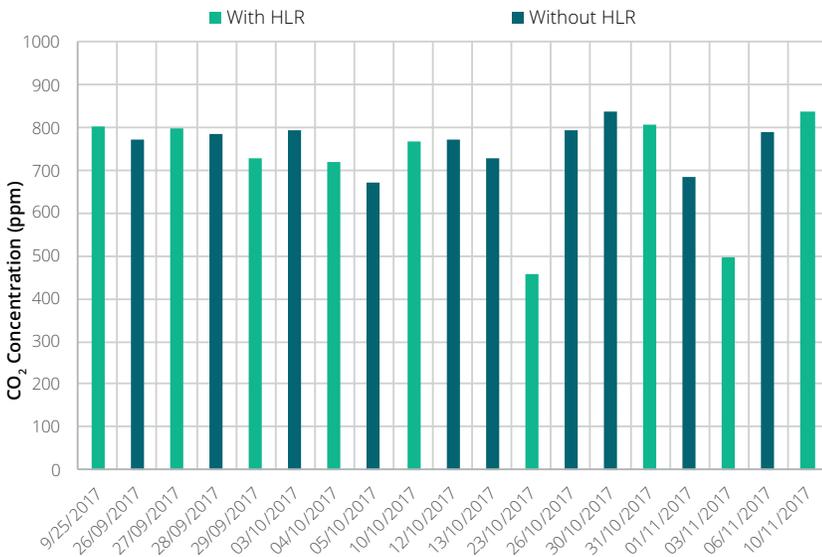


Figure 2: The enVerid Cloud displays continuous CO₂ measurements. HLR modules maintain CO₂ below the recommended target of 1,000 ppm.

Energy Savings: 33%

With HLR technology, the school is using 52% less outside air and saving 40 kW per hour of cooling – a 33% reduction in total HVAC energy consumption.

Additional Savings:

- **Filters:** Reducing outside air intake extends particulate filter life.
- **Reduced Corrosion:** Reducing outside air intake extends the useful life of the existing mechanical equipment and ductwork.

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enVerid Systems, Inc. is committed to improving energy efficiency and indoor air quality in buildings worldwide through its innovative HVAC Load Reduction® (HLR®) solutions. Awarded the prestigious 2016 R&D 100 Award, enVerid is the only solution that helps commercial, education and government buildings remove carbon dioxide (CO₂), aldehydes, volatile organic compounds (VOCs) and particulate matter (PM_{2.5}) from indoor air, reducing the outside air intake required for ventilation. enVerid's HLR technology is ASHRAE-compliant and has been recognized by the U.S. Department of Energy, the U.S. General Services Administration's Green Proving Ground Program, and the U.S. Green Building Council. For more information, please visit www.enverid.com.

CO₂
maintained at
healthy level

**Outside Air
Reduced 52%**
from **11,500 CFM**
(using VRP) to
5,500 CFM
(using HLR
technology and
IAQP)

Adding enVerid
HLR modules
**eliminates
the overhead
of ERV**

**Energy
Consumption
Reduced 33%**



Compliance with ASHRAE 62.1 IAQP

