MiGBC MICHIGAN GREEN BUILDING COLLABORATIVE

Project Case Study



Trinity Health – Oakland

UV-C HVAC Optimization, Energy Efficiency & Healthy Buildings Project

Objective: Evaluate whether an engineered high-intensity ultraviolet-C (UVC) application could restore performance in existing hospital air-handling equipment while simultaneously reducing energy consumption, addressing biological fouling, and supporting healthier indoor environments. Additionally, help address this research gap by examining AHUs with different initial conditions under actual operating conditions.

Details

- Pontiac, MI
- 365,000 Square Feet
- UV-C technology applied to two air handling units (AHUs)
- One control unit

Results

- Reduce AHU electricity consumption by approximately 92,664 kWh annually.
  - AHU-34ST - 25,265 kWh/year / 14.03%
  - AHU-5 - 67,399 kWh/year / 15.44%
- 41.5 metric tons of avoided CO2e emissions annually—from only two air-handling units
- Over 80% lower microbial concentrations in AHU-5 follow-up sampling, with all five post-treatment samples below 1 CFU/cm²

Financials

- Total investment for the two AHUs: $37,854
- Annual energy-cost savings: $12,046
- Simple Payback: 3.14 years

Project Partners

- **Principal Investigator / Building Science & Energy Research:** Dr. Deokoh Woo, University of Maryland
- **Project Development & Technical Lead / Engineered UV-C & HVAC Energy Optimization:** Rajul Patel, Citra Technologies
- **Microbiology Lead / Coil Biological Sampling & Laboratory Analysis:** Sarah Beatty, Culturewell
- **Facility Engineering, Project Leadership, Infection Prevention, and Clinical Environment Advisor:** Rocky Alazazi and Karen Ternes, Trinity Health Oakland Hospital





"Rather than replacing major HVAC equipment, this project investigated whether the performance of existing infrastructure could be improved through a continuously operating, engineered UVC application. The study demonstrates the potential to address energy performance and healthier indoor environments through the same HVAC intervention."

RAJUL PATEL
Citra Technologies

Citra Trinity Health