



Hopewell Valley Regional School District Earns Top Marks as the 2008 Clean Energy Educator of the Year

PROJECT INFORMATION

Organization

- Hopewell Valley Regional School District

Location

- Pennington, NJ

Project Contact

- Norman Torkelson, Director of Facilities, HVRSD

Technologies

- Geothermal
- Solar Electric System
- Energy Recovery

Total Project Cost

- \$1 million

NJCEP Incentives

- In excess of \$300,000

PROJECT SAVINGS

Estimated Annual Savings

- Reduced electricity consumption by more than 300,000 kWh
- Decreased CO2 emissions by nearly 200,000 pounds
- 30 – 40% reduction in the heating & cooling loads for areas served
- 25% reduction or more of utility consumption for areas retrofitted



Many of the Hopewell Valley Regional School District's facilities were built in the 1920s, which posed considerable challenges to the addition of energy-saving systems. New geothermal, solar electric systems and energy recovery technologies were added in stages, ensuring the project's success.

“By applying energy recovery technology to our older buildings, the savings alone justify the installation of the new equipment.

Additional benefits include improved thermal comfort and indoor air quality, as well as reduced operation and maintenance costs.”

Norman Torkelson
Director of Facilities
HVRSD

Background

The Hopewell Valley Regional District (HVRSD), located in Mercer County, New Jersey, is comprised of six schools. It is continually recognized as a high performing district academically, and has now also achieved one of the top honors from New Jersey's Clean Energy Program (NJCEP) – the 2008 Clean Energy Educator of the Year Award. This award is well-deserved, as the district has spent the last decade implementing an array of energy efficient technologies and systems throughout its facilities.

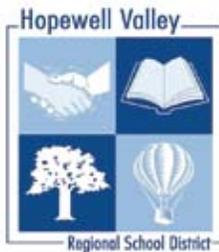
Challenge

Nearly half of the school district's buildings date back to the 1920s, presenting significant challenges to the installation of more energy efficient systems. Positive experiences with geothermal systems, especially when paired with the improved efficiencies associated with air-to-air heat exchangers, led district officials to analyze the benefits of installing this technology in their older buildings.

The retrofit project was designed to maximize efficiency and energy recovery while satisfying three primary objectives: 1) replacement of two compromised unit ventilator fresh air intake systems; 2) improved air quality in nine classrooms; and 3) installation of ventilation systems in two previously unconditioned storage rooms that were to be converted to work rooms.



The Hopewell Valley Regional School District also implemented design features at their middle school, which helped to increase energy efficiency. The saw tooth design, used along the new addition, takes full advantage of northern light and minimizes overheating from the westerly sun. By installing floor to ceiling windows for optimal lighting, the need for artificial lighting was cut in half.



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Solution

The district was eager to implement leading-edge demand side ventilation with energy recovery, but wanted to approach the project in stages to ensure its success. Initially, two high-efficiency heat exchangers were installed. These units recapture up to 80 – 95% of the thermal energy that is normally exhausted from an average classroom. Hours of operation are further reduced by the use of a classroom carbon dioxide sensor that controls ventilation, providing fresh air as required.

To ensure compliance with industry standards, both units were tested for functionality and indoor air quality after the initial installation. The energy recovery equipment greatly improved indoor air quality and thermal comfort. On a winter day with 25 degree outside air temperatures, fresh air still enters the classrooms at ~ 65 degrees. This, in turn, reduces operational stress on the existing HVAC systems.

Following this success, the district proceeded to install an additional eleven demand side ventilation systems in various classrooms around the district. Over the last year, the district also added two nominal solar panel systems.

Benefits

Thanks to the district's initiatives, students and staff are breathing easier through improved indoor air quality and thermal comfort with heating and cooling loads diminished by as much as 30%. The return on investment, for the demand side ventilation retrofit project is estimated to be just two to three years.

The return on investment for the newly installed solar electric systems is predicted to be recaptured in seven to ten years or less (including NJCEP incentives, cost of power produced and Solar Renewable Energy Credits). And, with the addition of informational kiosks, these solar electric systems have become popular educational tools, for students, staff and the public.

Norman Torkelson, Director of Facilities, has also taken a leadership role in educating others about how to practically and effectively implement energy efficient technologies. These innovations are fully replicable by any school, government or commercial facility, regardless of their age.