AIRSYS

New Generation Heat Pump Helps Georgia Middle School Achieve 85% Operating Cost Reduction

Background

Administrators at a Georgia middle school—home to 730 students and 84 teachers and staff—are focused on improving classroom environments through targeted investments in school safety and facilities renovation.

Challenges

Like many other schools across the country, staff and administrators face a number of challenges, including:

Budget constraints

Staff must balance limited funding with rising expectations. More than ever, the constrained financial resources require staff to develop and implement creative solutions.

High energy costs

Most school district administrators want facility operations to be both cost-effective and environmentally responsible. Energy prices continue to climb as power grid infrastructure becomes more unstable and expensive to operate. Therefore, school district leadership must deploy solutions that can counteract these rising costs.

Maintaining high attendance

School administrators consider high student attendance rates critical. Student attendance affects the overall quality of education and impacts the quantity of funding. Failures in physical plant (e.g., power outages, air conditioning breakdowns, and inefficiencies) can result in higher absence rates.

These challenges require strategic planning and effective management to ensure efficient operation of K-12 facilities and the well-being of students and staff.

At a glance

Challenge:

Provide students and teachers with safe, stable, and cost-effective classroom air temperature and quality control.

Solution:

Airsys™ external wall-mounted heat pump

Results:

- **85% reduction** in classroom cooling-related operational costs
- Potential energy **savings of nearly $5 million per year** across the school district
- Quieter operation and reduced noise levels

Airsys School Air Solutions

Noise Level:

The only HVAC system that approaches the standard classroom acoustic target - 36-44 dBA

Air Quality:

6-10x greater moisture removal capacity compared to typical solutions - up to 25 pints per hour

AIRSYS

Solution: Airsys School Air Solutions™ and Energy Monitoring

At this middle school, facilities staff wanted to modernize school room comfort air conditioning units. Operational and maintenance costs were rising as they continued to run their aging heat pumps. The facilities staff also expressed interest in a provider that could offer local support, act as an implementation advisor, and be a long-term partner.

After consulting with their technology distributor, the HVAC technology supervisor of the school district decided to engage with Airsys, noting that the team "understood our business requirements, provided advice on designing a comprehensive solution, and offered a highly efficient product. They also produced solid and accurate performance numbers that clearly illustrated rapid ROI."

Technical support was also a key consideration. Airsys technician support staff are based in the U.S., so customers don't need to call overseas for help. Their technician support staff operates 24-hours a day, year-round. In addition, Airsys has recently built a new 264,000 square foot manufacturing site in nearby Woodruff, South Carolina, and maintains a nationwide network that keeps replacement parts readily accessible. As a result, if a fan motor were to fail, customers can typically receive a replacement within a day rather than waiting several weeks.

Based on the relationship between the organizations, the school district's facilities team decided to bring in an Airsys School Air Solutions unit for evaluation. The local Airsys team, led by Russell Letbetter, Airsys Vertical Marketing Manager for the East Coast, quickly arranged the delivery of a new unit.

"We regularly meet with distributors, contractors, consulting engineers, school boards, and facilities staff to determine evolving business and education needs and to propose the most sensible long-term solutions," he said.

"In today's market, many air conditioning design alternatives exist," said Letbetter.

"We wanted to provide this school not just with a replacement technology, but with concrete proof of superior performance and quick ROI, so that he could have some hard numbers to share with the school board."

Airsys proposed a solution that involved monitoring both the school's existing (non-Airsys) 13-year-old heat pump unit and the newly installed Airsys School Air Solutions exterior wall-mounted heat pump. Classroom-level smart metering with real-time cloud reporting enabled the monitoring exercise.

Letbetter and the school district's HVAC technology supervisor arranged for the two units to support similar class size, student load, and setpoints. The monitoring system recorded both the performance and energy consumption levels (kWh) of the two units.

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School District HVAC Technology Supervisor

Results reveal significant efficiency and environmental gains

Both monitored units are comparable in size and capacity, 5–6-ton external wall-mounted units. As data began to come in, it quickly became clear that the Airsys unit presented three clear operational advantages over the older unit:

Noise

36-44 dBA

The Airsys unit operated much more quietly. Noise levels are based on the sound level inside the classroom. In the case of an outdoor wall-mounted unit, room occupants can hear it running. Low noise levels are critical for maintaining student comfort, which in turn leads to a better learning environment and higher student achievement.

Indoor air quality

Up to 25 pints of moisture removal per hour

The Airsys unit is capable of gathering and analyzing real-time environmental data, thanks to return and supply temperature and humidity sensors. This enables the unit to know when to reduce or ramp up compressor and blower speeds. The unit is also equipped with two CO_2 gas sensors and can open and close fresh air dampers based on third-party control systems signals. Therefore, facilities staff can better control CO_2 levels in the classroom, optimizing occupant comfort.

Energy efficiency

Up to 45% energy reduction

By comparing the energy consumption levels of both units and gathering utility peak and off-peak billing information, Letbetter was able to ascertain and extrapolate operational costs. Overall, the Airsys unit demonstrated an **85% reduction in operating cost** compared to the legacy unit.

Specifically, the monitoring results revealed the following savings:

	monthly	yearly
Per Unit	$413	$4,956
Per school (50 units)	$20,650	$247,800
Per district (1,000 units)	$413,000	$4,960,000

Why the stark difference in performance?

The forward-thinking, energy-efficient, variable-speed Airsys inverter technology can precisely control pump and fan pressure and speed, addressing changing system demands while minimizing energy waste.

Most legacy technologies only offer fixed-speed formats that produce the same amount of cool air regardless of the room's changing cooling needs. Therefore, these older units consume more energy than needed. Over time, such variations in performance lead to significant differences in operational cost. For the entire Columbia County School District, the potential savings could reach nearly $5 million per year.

A partnership built on strong collaboration

In this school district, technology investment decisions focused on measured performance, operating costs, and long-term lifecycle value, rather than only the initial cost.

Return on Investment (ROI) over the unit's lifetime is key. Compared to traditional technologies, owners will recoup the higher upfront costs of the Airsys within the first year and will benefit from an overall operational cost reduction of up to 85% over the lifetime of the product.

The collaboration between the middle school and Airsys reflects a shared commitment to designing schools that deliver cleaner air, smarter energy use, and consistent year-round comfort.

For more information

Airsys delivers precision heat pump and thermal control solutions that optimize student learning environments while cutting energy costs, backed by our 245,000+ sq ft U.S. manufacturing facility in Woodruff, SC. Visit our website or contact Airsys Sales to learn more.

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