

Fontana Unified School District Goes Back to School with High-Efficiency Rooftop Units

Public schools educate millions of students with few resources and shoestring budgets. There is rarely enough left over for capital improvement projects or maintaining an aging infrastructure. Maintaining energy systems, like repairing or replacing HVAC units, is extremely challenging and typically completed at the lowest cost, which usually equates to the lowest efficiency. California addressed this problem with Proposition 39, the California Clean Energy Jobs Act, which provides funding to K-12 schools for energy efficiency and renewable energy projects. Even with this additional funding, schools still struggle to install high-efficiency equipment, due to the process being confusing and tedious.

Fontana Unified School District (FUSD) in southern California faced a challenge similar to many school districts: a portfolio of antiquated and inefficient rooftop air conditioning units (RTUs) and control systems that were at the end of their useful life, causing the district to invest a significant amount of time and capital to maintain and operate them. Additionally, the old RTUs were unable to maintain temperature and humidity levels, resulting in uneven temperatures, student and teacher discomfort, and unnecessary overuse. Finally, the control system did not support software updates, adding to the inefficiencies.

Keys to Success

FUSD worked with SmartWatt, an efficiency contractor, to explore solutions and applied for a grant through Proposition 39 to pay for the installation of 201 high-efficiency Carrier RTUs in 30 buildings across four schools. The new package units ranged from 2 to 20 tons and were installed within a three-month window over the district's summer vacation. The integrated energy efficiency ratio of the units exceeds the Energy Department's RTU specification and the Consortium for Energy Efficiency Advanced Tier criteria for RTU efficiency. In addition, they worked with the manufacturer to ensure that these RTUs were installed and commissioned properly so they could realize the full benefits of the new equipment.



FUSD High School. Image courtesy of FUSD

Results of High-Efficiency RTU Replacements

Number of buildings	30
Number of high-efficiency RTUs	201
Cooling capacity	1,100 tons
Electricity savings	1,061 MWh/year
Demand savings	446 kW
Gas savings	1,574 therms/year
Energy cost savings	\$214,000/year
Savings-to-Investment Ratio	1.06

“These are innovative legacy projects that will support our students and the environment for decades to come.”

- Randal Bassett, FUSD Superintendent

Project Results

The new high-efficiency units and commissioned controllers have led to optimal energy performance and improved humidity and temperature levels throughout the buildings. The remote user interface of the new control system allows the district to schedule and closely monitor temperatures and humidity levels, ensuring that they are optimized for occupant comfort. In addition, the new control system features an open protocol infrastructure, giving FUSD the option to integrate additional systems in the future.

Next Steps

FUSD and their contractor have partnered to identify additional energy optimization measures to be carried out over two additional phases. The second phase of the project is slated to begin summer 2017 and will include Title 24-compliant exterior LED lighting and lighting control systems throughout the district's schools. The third phase of the project is scheduled for summer 2018, and will include 150-190 additional new high-efficiency RTUs. All three phases were designed to comply with Proposition 39 requirements and will result in zero capital outlay from the district.

FUSD Organizational Profile

Year Established	Established in the 1920s and unified in 1956
Number of Facilities	45
Total square footage	3.4 million sq. ft.
Number of Students	38,742
Project Scope	Innovative management approach to RTU efficiency



RTU Replacement. Image Courtesy of FUSD

Tips and Best Practices

- ▶ Assemble a team knowledgeable about building systems and capable of working efficiently through compliance and rebate applications.
- ▶ Incorporate the energy and non-energy benefits into the economic considerations of HVAC replacements.
- ▶ Consider whole building retrofits and properly size new HVAC units to meet expected loads.

Learn More

Through the [Better Buildings Alliance](#), members across different market sectors work with the U.S. Department of Energy's (DOE) exceptional network of research and technical experts to develop and deploy innovative, cost-effective, energy-saving solutions that lead to better technologies, more profitable businesses, and better buildings in which we work, shop, eat, stay, and learn.

Learn more about how to join the Better Buildings Alliance's Advanced RTU Campaign at <http://www.advancedrtu.org/>. The Advanced RTU Campaign is a recognition and guidance program, sponsored in collaboration with ASHRAE, the Retail Industry Leaders Association, the Federal Energy Management Program, and DOE's Buildings Technology Office, designed to encourage building owners and operators to take advantage of savings opportunities from high-efficiency RTUs across the country. Find more resources and guidance on space conditioning in the [Better Buildings Solution Center](#).