

Los Angeles Unified School District Sees 41% HVAC Energy Savings with Transformative Wave's CATALYST



The Los Angeles Unified School District (LAUSD) is the second-largest public school district in the nation; enrolling more than 650,000 students K-12 in over 800 schools and 187 public charter schools. The district covers more than 700 square miles. For this particular project LAUSD chose to apply Transformative Wave's CATALYST at the Lawrence Middle School and Los Angeles Center for Enriched Studies (LACES) campuses as a pilot program to see what achievements it could make in reducing HVAC energy use. The LACES facility is used in this case study.



Facility Profile

Los Angeles Center for Enriched Studies (LACES)

Number of RTUs:	17
Nominal Tons of RTU Cooling:	202.5 Total Retrofitted
Nominal Fan Horsepower:	72 HP Total
Operational Hours per Year:	2,860
Cost of Electricity:	\$0.12 per kWh
Cost of Natural Gas:	\$0.78 per therm

The Challenge

LAUSD became aware of the CATALYST after a contact at the Los Angeles Department of Water and Power introduced Transformative Wave to the district. After the successful demonstration at Miguel Contreras Learning Center (MCLC), Transformative Wave was awarded the Lawrence Middle School and LACES projects. For the LACES project the CATALYST was installed to address the excessive energy use of the facility's RTUs.

The Project

The project consisted of retrofit of 17 rooftop units (RTU) on the LACES campus and 18 RTUs on the Lawrence Middle School campus. Transformative Wave installed the CATALYST and eIQ Platform. The project cost was funded by the Los Angeles Department of Water and Power, and the District's Maintenance and Operations staff installed CATALYST with training and supervision by Transformative Wave.

Installation

In addition to the remote access, fault detection, diagnostic capabilities and other features provided by the eIQ Platform, the system was deployed as a full open protocol building management system. This provides additional features such as web based scheduling and set point control.

The installation of CATALYST solutions on these rooftop units was completed in March 2013. A three month measurement and verification (M&V) period was conducted from April through June, during which time unit control alternated daily between the as-found baseline condition (Standard Mode) and full CATALYST (Energy Saving Mode) control. Sub metering was conducted on each installed unit through use of a WattNode® true power meter to develop the savings for this period.

The Results

The results for LACES show a 32% reduction in total HVAC electrical usage during this period as detailed in Table 1 below. Because the unit is cycling between Standard and CATALYST modes, the total energy savings in the chart below is only half of what is expected during normal CATALYST operation.

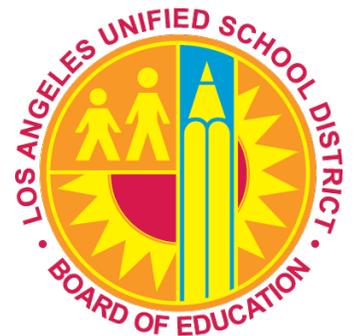
Mode	Standard		CATALYST		Savings		
	Total Energy	Avg Power	Total Energy	Avg Power	Total Energy	Avg Power	
	(kWh)	(kW)	(kWh)	(kW)	(kWh)	(kW)	
Fan	8,097	24.0	3,886	11.5	4,211	12.5	52%
Cooling	13,670	40.5	10,860	32.1	2,810	8.3	21%
Electric	21,767	64.4	14,746	43.7	7,021	20.8	32%

Table 1. LACES Total Composite Energy Savings

¹Results based on data collected from the eIQ Platform from April 1st, 2013 through June 30th, 2013. Sample includes 4,077 unit runtime hours in the Standard mode with an Avg OSA temp of 67.2°F and 4,061 runtime hours in the CATALYST mode with an Avg OSA temp of 66.8°F.

Updating the projected savings estimate for all units based on the information obtained during the M&V period, the annual electrical savings were revised to be 67,000 kWh (41%) or 115 kWh/Ton per 1,000 runtime Hrs.

Although there was no standard mode emulation for the Lawrence Middle School site, annual projected savings were updated based on the information obtained and can be summarized as a savings of 38,500 kWh (65%) or 130 kWh/Ton per 1,000 runtime Hrs.



Conclusion

The CATALYST has helped LAUSD achieve significant HVAC energy savings with the installation of the CATALYST on three of its sites. These savings contribute to a lower operating expense for these sites and strengthens the case for additional projects with the LAUSD.