



HEROES FOR ZERO: BUILDING A K-12 ENERGY EFFICIENCY FRAMEWORK

SOLUTION OVERVIEW

The Los Angeles Unified School District (LAUSD) wanted to accomplish aggressive energy and water conservation goals to address high energy usage and costs, but lacked a comprehensive framework to track and measure its consumption over time, train its staff, and engage the greater community. To tackle these challenges, the District developed a comprehensive suite of effective programs and strategies which focus on health and wellness, education, recognizing partnerships, optimizing performance, improving efficiency, and sharing best practices. These programs complement the District's goal to reduce energy and water consumption by 20 percent by 2024. As of 2018, LAUSD has realized an energy reduction of 5 percent and a water reduction of 10 percent from a 2014 baseline.

ORGANIZATION TYPE

K-12 School District, Urban School District, Student Population: 660,000

GOAL

Reduce district-wide energy intensity 20% by 2024

BARRIER

Lack of facility data tracking systems, staff and end-user training, and conservation awareness

SOLUTION

Comprehensive suite of energy conservation programs including the HEROES for Zero program

OUTCOME

5% reduction of annual energy consumption and 10% reduction of annual water consumption in 2018 from a 2014 baseline.

POLICIES

LAUSD is the second largest public school district in the country with a portfolio of 70 million square feet, including 1,200 schools and educational facilities and serving over 660,000 students. The District spends over \$120 million annually on utility costs across its 13,500 buildings. In 2007,

the Board of Education passed GreenLAUSD, a resolution calling for development of sustainability protocols including quantification of energy and water usage and committing the District to becoming the “most sustainable large urban school district in the nation.” As a result, the Sustainability Initiatives Unit (SIU) was established in 2009 to oversee the District’s implementation of GreenLAUSD.

To help address escalating utility costs, in 2016 LAUSD set an aggressive goal to reduce energy and water consumption by 20 percent by 2024 from a 2014 baseline. In 2015, LAUSD enacted the Energy and Resource Conservation Policy, which delineates energy and water efficiency measures that can be taken by staff at all district locations to maximize energy and water savings and reduce general fund obligations.

A set of six focus areas were developed: Energy Conservation, Water Stewardship, Awareness & Outreach, High Performance Schools Green Building Certification, Campus Ecology, and Emerging Technologies. With these areas at the forefront of the District’s sustainability efforts, LAUSD remains focused on its mission to be the “most sustainable district in the nation by developing and implementing programs that support energy efficiency, water conservation, and educational and awareness programs.”

One of the District’s most recent successes, the HEROES for Zero program – which stands for **H**ealth and wellness, **E**ducation, **R**ecognize partnerships, **O**ptimize performance, **E**fficiency, and **S**haring best practices – serves as the framework for policy implementation.

- **Health and wellness:** Providing a healthy and nurturing environment conducive to learning.
- **Education:** Preparing students to become environmentally literate and equipped for the new green economy.
- **Recognize partnerships:** Highlighting collaborations including federal, state, and local opportunities to share resources.
- **Optimize performance:** Improving building performance through programs such as Proposition 39, Better Buildings Challenge, and Commissioning and Retro-Commissioning.
- **Efficiency:** Making improvement to HVAC, lighting, and controls systems.
- **Sharing best practices:** Leveraging partnerships with experts such as the U.S. Department of Energy (DOE) and New Buildings Institute.

The goal of the HEROES for Zero program is to apply energy efficiency measures to avoid waste, reduce energy consumption through education and awareness, use technology to understand district facilities, and collaborate with organizations on the federal, state, and local levels to increase impact.

HEROES for Zero takes a holistic, interactive approach to sustainability engagement, featuring multiple sustainability elements believed to contribute to an overall reduction in energy consumption, while encouraging behavioral change.

In addition to the HEROES for Zero Program and associated district-wide challenge, the District has also introduced a number of additional initiatives including the Proposition 39 program, Solar Energy Initiative, HVAC systems replacement, energy efficiency partnership agreements with the

Los Angeles Department of Water and Power (LADWP), [LADWP Water Fixture Retrofit Program](#), [LADWP Recycled Water Project](#), [Central Basin Municipal Water District Recycled Water Program](#), [Save the Drop Campaign](#), [Drought Response Outreach Program for Schools \(DROPS\)](#), [Collaborative for High Performance Schools \(CHPS\)](#), [USGBC LEED Certification](#) for schools, and [LAUSD emPowered program](#) with the [Alliance to Save Energy](#). The efforts will be discussed in further detail in the following sections.

PROCESS

The SIU and Energy Management Unit (EMU) are part of the [Maintenance and Operation Branch](#) of the [LAUSD Facilities Services Division \(FSD\)](#). These units developed the [Energy and Resource Conservation Policy](#) which was presented by the Chief Facilities Executive and approved by the Board of Education, District officials, and stakeholders in June 2015, serving as a guideline for district operational procedures. School principals, site administrators, plant managers, and other associated staff oversee the implementation of the energy and water conservation measures. As part of various energy and water conservation programs, including **HEROES for Zero**, the District monitors annual energy and water consumption for all facilities on a monthly basis, analyzing consumption and cost, and comparing performance to the previous fiscal year and baseline year. Energy data is collected and reviewed by the Energy Management Unit within the Maintenance and Operations Branch. LAUSD has a stand-alone utility accounting software application for managing all utility data. The Energy Management Unit uses this software application to calculate energy and water consumption on a site basis. Oversight is provided by the Director of Architectural and Engineering Services with additional support provided by SIU. This tool enables the District to track and manage progress overtime based on the various sustainability measures introduced at each school site.

Phase 1 – Policy Framework

The Maintenance and Operations branch formed SIU to develop the implementation framework of the policy, including guidance to school and site leaders. SIU also developed the program outreach strategy designed to raise awareness of the new policy and educate the District's faculty, students, and staff, in addition to the greater community.

LAUSD learned that a collaborative approach to assessing the benefits and potential costs of new sustainability programs and processes is best for overall program success. Policymaking efforts call for ongoing stakeholder engagement, including coordination of all relevant experts in energy and sustainability, throughout the drafting period to ensure maximum program participation, input, and success.

In the case of district-wide awareness programs like [HEROES for Zero](#), SIU maintains communication and involvement with school principals, administrators, science coordinators and teachers, STEM coordinators, and the Energy Management Unit, to identify resources to support the HEROES strategies and provide guidance to teams for program implementation.

Phase 2 – Program Design

In line with the Energy and Resource Conservation Policy “Awareness and Outreach” focus area, sustainability engagement programs encourage collaboration, promote student participation in sustainable behavior, and increase overall residual impact:

- HEROES for Zero Contest: Uses the HEROES elements (Health & wellness, Education, Recognizing partnerships, Optimizing performance, Efficiency, and Sharing best practices) to encourage students to engage in sustainable behaviors and practices, encourage teachers to connect Zero Net Energy (ZNE) activities with the Science, Technology, Engineering, Arts, and Math (STEAM) curriculum, and inspire surrounding communities while helping the District reach its ZNE-Ready goals.
- Proposition 39 Student Energy Audit Training (SEAT): Prepares students for future energy-related occupations and careers by providing them with improved critical thinking skills, as well as technical and professional knowledge that enhances their understanding and employability within the energy management industry.
- LAUSD emPowered: Partners with the Alliance to Save Energy to pilot an energy education program that is online, team-based, and interactive.

Phase 3 – Program Implementation

Ongoing collaboration is also important for program implementation, which is why LAUSD engages with a network of stakeholders to facilitate the many necessary components of district-wide program operations.

- School Site Administrators and Services (Principal, Assistant Principal, On-Site School Coordinators, and Staff): Supports SIU in the feasibility, evaluation, and implementation of new sustainability engagement programs. Responsible for soliciting participants within respective school sites, running activities, and submitting program applications to SIU for processing and tracking.
- Local District STEAM Coordinators: Helps review and advises SIU on proposed programs that will include curriculum involvement and instruction.
- Energy Management Unit: Provides utility data necessary to evaluate performance and cost savings.
- Sustainability Initiatives Unit: Evaluates, promotes, administers, and tracks progress on energy efficiency and water conservation programs within the district. Supports the Division of Instruction, school site administrators, and local district STEAM coordinators in providing tips and recommendations on program logistics distributed to participating schools.
- Division of Instruction: Reviews program measures and characteristics for compliance with district instructional standards, industry standards, and minimum acceptable instructional requirements.
- Information Technology Division: Enables student achievement and operational efficiency through deployment of appropriate technical solutions for our students, employees, and the community.

The latest policy in development by the SIU is the ZNE-Ready Policy, which is currently undergoing Facility Division review for implementation. To support the District’s environmental stewardship goals, LAUSD will adopt a process for incorporating ZNE-Ready design features into new buildings,

bond modernizations, and facility projects. This policy will establish guidelines and specifications based on the ASHRAE Advanced Energy Design Guide for K-12 Schools and updated LAUSD design standards to ensure architects of new construction and modernization projects are equipped to support the District's ZNE-Ready goals.

OUTREACH

LAUSD communicates all its Education & Awareness programs through the training of its site leaders (principals, site administrators, plant managers), in addition to outreach conducted to faculty, students, and staff. For site implementers, the My Learning Green website shares the District's mission, goals, and actions. The website also features opportunities to get involved, such as greening campuses and offices and participating in audits and reduction challenges.

LAUSD develops and conducts eco-literacy initiatives that are designed to meet the District's sustainability education and awareness goals. These include programs like DROPS Education & Outreach, Save the DROP Water Awareness Contest, HEROES for Zero, LAUSD emPowered, and Prop 39 Student Energy Audit Training (SEAT) Program.

- The outreach efforts raise awareness about:
 - Energy conservation and climate change
 - Water stewardship
 - Sustainability in the built environment
 - Environmental stewardship and urban habitat.
- Partnerships were developed to:
 - Provide experiential and place-based learning opportunities
 - Promote professional and development opportunities linking sustainability and the STEAM standards-based curriculum
 - Link sustainability projects with opportunities for student training and workforce development.
- The outreach efforts encourage and celebrate:
 - Sustainability leadership
 - School-based sustainability efforts
 - Environmental volunteerism and community engagement.

For all district-wide programs, LAUSD used mixed media to launch a printed program guide, web page, social media campaigns, and e-mail notifications to school contacts. LAUSD Office of Communications and Media Relations is responsible for all public affairs activities involving these programs, including program openings and awards ceremonies.

School administration buy-in and participation was determined prior to program implementation via stakeholder engagement meetings during early stages of program research and evaluation.

TOOLS AND RESOURCES

This section collects various resources that LAUSD used to implement the HEROES for Zero

program and associate district-wide initiatives.

- [ASHRAE Advanced Energy Design Guide for K-12 Schools](#)
- [Central Municipal Water District Recycled Water Program](#)
- [Collaborative for High Performance Schools](#)
- [ENERGY STAR Portfolio Manager](#)
- [HEROES for Zero Presentation](#) (from the 2018 Green Schools Conference)
- [HEROES for Zero 2017-2018 Winning Team Videos](#)
- [HEROES for Zero 2017-2018 Award Ceremony Video](#)
- [LADWP Recycled Water Project](#)
- [LADWP Water Fixture Retrofit Program](#)
- [LAUSD Board of Education Resolutions and Energy and Resource Conservation Policy](#)
- [LAUSD DROPS](#)
- [LAUSD Education and Awareness](#) (includes Drought Awareness Video)
- [LAUSD emPowered program](#)
- [LAUSD Sustainability Initiatives Unit \(SIU\) Video](#)
- [My Learning Green](#)
- [Proposition 39](#)
- [Save the Drop Campaign](#)
- [Solar Energy Initiative](#)
- [State of CA Drought Response Outreach Program for Schools](#)
- [USGBC LEED Certification](#)

MEASURING SUCCESS

LAUSD is currently using its internal software platform to benchmark and track its energy and water consumption but plans to upload data to the [U.S. EPA’s ENERGY STAR® Portfolio Manager tool](#) in the future. Use of this tool will enable the District to obtain a rating score for facilities in its portfolio based on a 1-100 scale for efficiency and review reports on a monthly basis, comparing progress to previous years as well as similar facilities.

The District’s goal for the Better Buildings Challenge is a 20 percent reduction in energy use intensity per square foot and water consumption from a 2014 baseline by 2024.

Better Buildings Challenge	Average EUI (kBtu/sq.ft.)	Average Water Use (gal/sq.ft.)
2014 Baseline	31.1	34.2
2024 Target (20% reduction)	24.8	31.2

Energy and water consumption are analyzed twice a year based on the District’s fiscal year and the calendar year. The District is continually monitoring its progress towards achieving the 20 percent reduction goal and will adjust its strategy based on the results. Data is also submitted to the Better Buildings Challenge on an annual basis and posted in an [online data display](#).

OUTCOMES

LAUSD continues to implement a comprehensive suite of energy and water conservation and education programs to track and manage consumption, train and educate staff, and engage the

greater community in its sustainability efforts. As a result, the District has propelled itself toward its goal of becoming the most sustainable large, urban school district in the country. Protocols are in place to collect energy and water consumption data on a monthly basis and to analyze historical trends on semi-annual basis. The program also submits data to DOE as part of its commitment to the Better Buildings Challenge. In 2018, the District achieved a 5 percent reduction in energy use intensity and a 10 percent reduction in water use intensity from a 2014 baseline, well on its way to reaching its goal of a 20 percent reduction by 2024.

To date, the District has made significant improvements by leveraging the comprehensive suite of conservation measures including:

- Implementing energy and water efficiency upgrades at over 200 campuses in the district focusing on lighting, HVAC systems, controls, and plumbing.
- Engaging students from over 50 schools and awarding \$25,000 to the top three schools and \$3,000 to eight additional schools annually participating in the HEROES for Zero contest.
- Developing the SEAT program in collaboration with the California and Los Angeles Conservation Corps and LAUSD's Work Experience Education Office to train over 20 student auditors.
- Engaging students from 40 campuses in the LAUSD emPowered interactive education strategy.
- Installing solar arrays at 59 campuses and five administrative sites totaling 21 MW of solar capacity, enough to power 3,300 homes for a year.
- Piloting several emerging technologies including battery storage, plug load, LED lighting, HVAC controls, electric vehicle charging stations, and leak detection.
- Developing a technical manual for stormwater and implementing design standards to maximize stormwater capture and infiltration throughout the District. LAUSD is implementing projects at more than 10 campuses with funding from state and local partners.
- Adopting and integrating the CHPS criteria into the District's design standards. LAUSD has 128 CHPS-recognized projects and seven LEED-certified projects.
- Installing recycled water at seven school sites.

LAUSD will continue to build upon its commitment to energy efficiency and conservation goals by introducing new initiatives such as the ZNE-ready policy to expand the impact of the District's effort and educate the greater community.

