

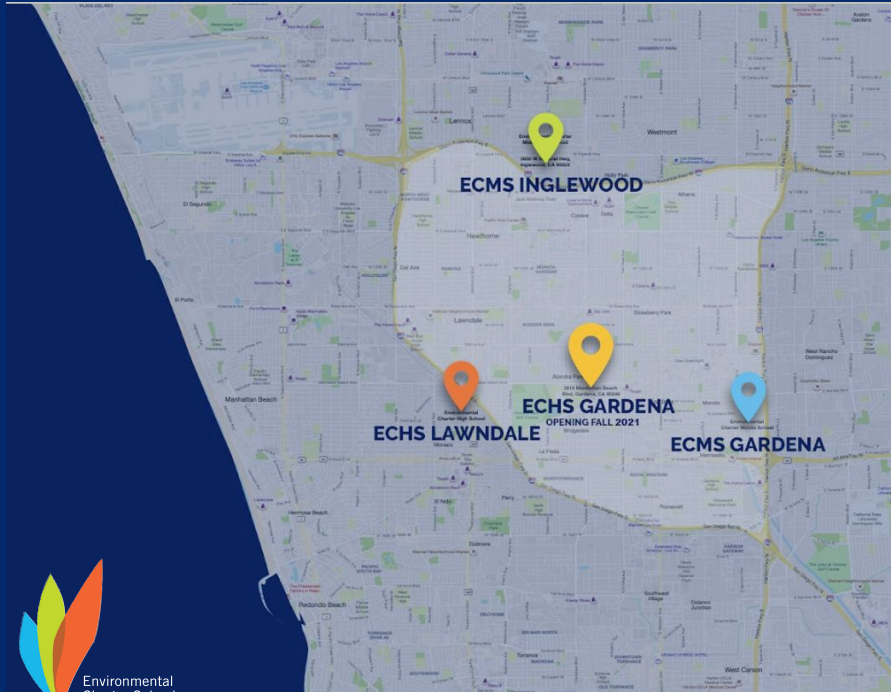


# Environmental Charter Schools (ECS)

**Mission:** To reimagine public education in low-income communities of color to prepare conscious, critical thinkers who are equipped to graduate from college and create a more equitable and sustainable world.



# A snapshot of our free, public charter school district:



**4**  
College prep Schools  
in South Los Angeles

**1,530**  
Middle & High School  
students

**71%** Latino  
**9%** African American  
**3%** Asian  
**2%** Caucasian  
**15%** other/Declined  
to State

**92%**  
**1st generation**  
college students

**91%**  
of our students  
qualify for free or  
reduced lunch

**12.1%**  
English Language  
Learners  
**13%**  
Students with  
Exceptionalities

# ECS Energy CLASS Prize Team

Team members regularly attended **online trainings** and **coaching calls** to learn more about benchmarking, indoor air quality, hazard mitigation, sustainability, and data management in order to address building deficiencies and implement energy efficient improvements throughout the LEA

**Alison Diaz,**  
**Energy Champion**

ECS Founder & Director of Growth  
and Sustainability



**Brendon Jasso,**  
**IAQ & HVAC Expert**

CEO of MBA Mechanical



**Tashanda Giles-Jones,**  
**Environmental Impact Lead**

ECS Environmental Program Lead



**Chris Ing,**  
**Certified Energy Manager**

MBA Mechanical



**Jen Fenton,**  
**Communications Lead**

ECS Director of Strategic Initiatives





# Progress Made During Phase 2 and Associated Impacts

"You can't manage what you don't measure."

- Peter Drucker



**Energy Audit**  
Level 1 Energy Audit Report  
Environmental Charter HS - Gardena

Prepared for:  
Environmental Charter High School - Gardena

16 March 2024  
(v2 updates 4-26-24)

Chris Ing Consulting LLC  
Chris Ing, MA, CFM



ENERGY STAR® Statement of Energy Performance

**100** Environmental Charter HS - Gardena

Primary Property Type: K-12 School  
Gross Floor Area (GFA): 40,831  
Built: 1981

For Year Ending: May 31, 2023  
Date Generated: March 16, 2024

ENERGY STAR® Score\*

1. The ENERGY STAR Score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

<b>Property Address</b> Environmental Charter HS - Gardena 2818 Manhattan Beach Blvd Gardena, California 90248	<b>Property Owner</b> ECHA	<b>Primary Contact</b> Chris Ing 8001 Gateway Drive Oceanside, CA 92056 BOB@ECHA.org chrising@echarhs@gmail.com
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Property ID: 33372276

Energy Consumption and Energy Use Intensity (EUI)

<b>Site EUI</b> 5.4 kBtu/ft <sup>2</sup>	<b>Annual Energy by Fuel</b> Electric, Grid (kBtu) 198,164 (87%) Natural Gas (kBtu) 28,700 (13%)	<b>National Median Comparison</b> National Median Site EUI (kBtu/ft <sup>2</sup> ) 47.3 National Median Source EUI (kBtu/ft <sup>2</sup> ) 121.6 % Diff from National Median Source EUI 89%
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**Source EUI**  
15.8 kBtu/ft<sup>2</sup>

**Annual Emissions**  
Total (Equivalent Based) CO<sub>2</sub> Emissions 15 (Metric Tons CO<sub>2</sub> Equivalent)



Energy Efficiency Measure (EEM)	Demand Savings (kW)	Annual Electric Savings (kWh)	Annual Natural Gas Savings (therms)	Annual Cost Energy Savings (\$)	Measure Cost (\$)	Savings to Investment Ratio (SIR)	Simple Payback Period (Yrs)
Install 39.43 kW Solar PV System	9.70	58,065		\$16,747	\$137,996	1.81	8.2

**EEM #1 – Install solar photovoltaic (PV) system**

- This measure involves installing an approximately 39.43 kW solar photovoltaic system on the roof of the Education building, in order that the school begins generating some of its own electricity.





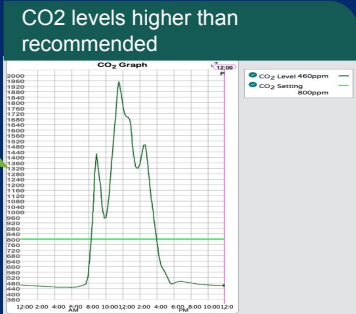
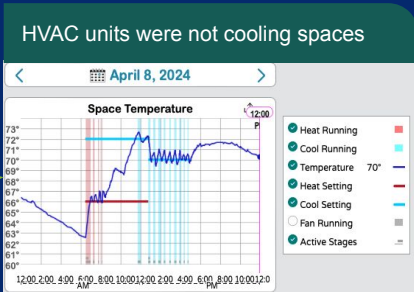
# Progress Made During Phase 2 and Associated Impacts: Digging Deeper

California Energy Commission

California Schools Healthy Air, Plumbing, and Efficiency Program (CalSHAPE)

**\$70,470**

California Schools Healthy Air, Plumbing, and Efficiency Program - CalSHAPE



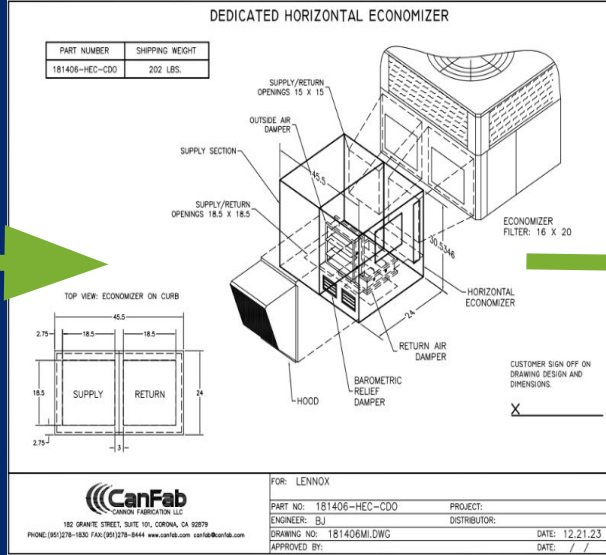
# Progress Made During 2 Progress and Associated Impacts: Piloted Custom Designed Economizer



**Existing Unit:**



**Custom Design:**

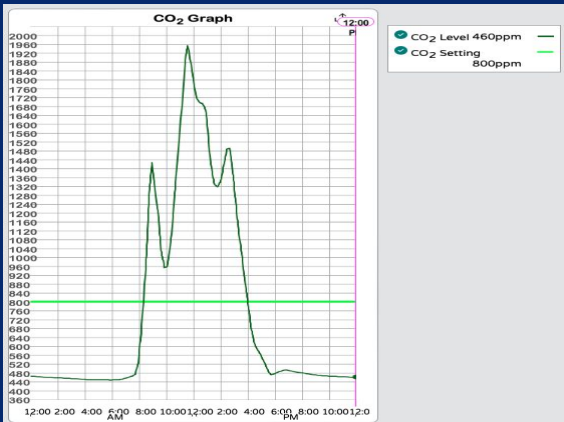
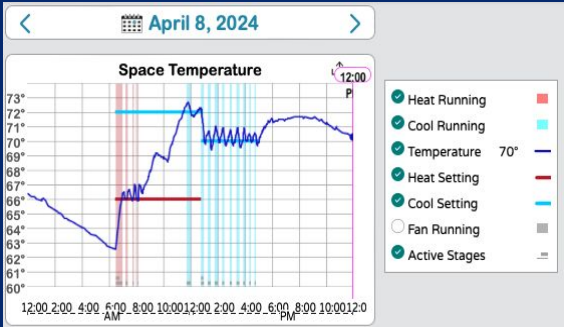


**New Economizer:**

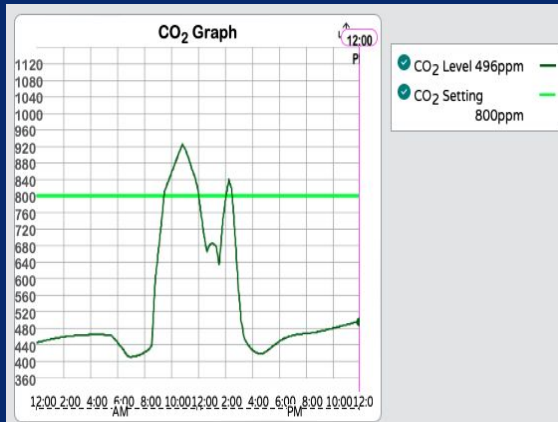
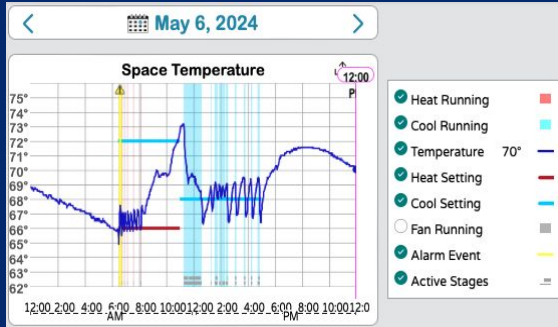


# Progress Made During 2 Progress & Associated Impacts: What We Learned in Room 305

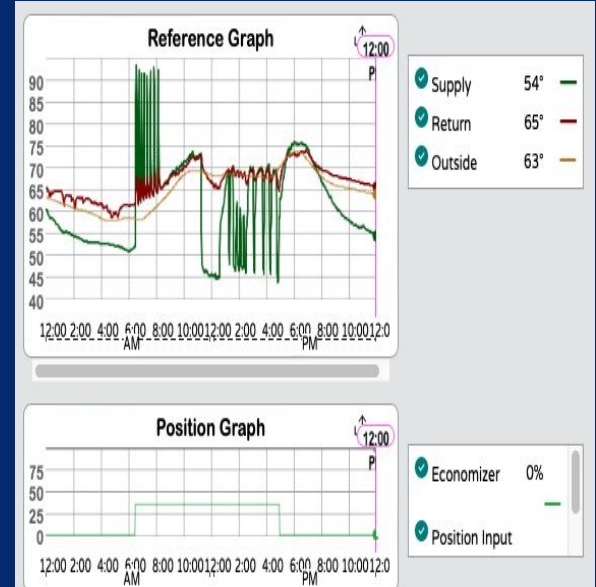
## Pre-Economizer:



## Post-Economizer:



## Reference Chart:



# Summary of Facilities Addressed in Plan: ECHS-Gardena



- Opened in 2021
- 2+ acres of learning space
- Located across the street from El Camino Community College
- Serves approximately 450 students (9-12th)
- **40 year old multi-story buildings**
- **19 classrooms** with temperatures and CO2 measurements higher than recommended





# Summary of Proposed Building Upgrades

ECS proposes the following **critical improvements** for a 40-year old building in order to improve the health of the classrooms, the air quality, and the ventilation systems resulting in an energy positive environment:

Upgrade	Description	Est. Timeline
		1-2 months (concurrent with stakeholder input and feedback)
Mechanical System Design Plans	Collaborate with engineers to design the new HVAC system based on CalSHAPE data.	July 2024 - November 2024
HVAC Systems	Upgrade or replace approximately 30 inadequate HVAC systems (87 tons current usage >>> 123 tons needed).	Summer 2025
HVAC Ductwork & Materials	Install new ductwork for all HVAC systems.	Summer 2025
Electricity	Plan for a 10-15% increase in electricity consumption due to additional HVAC systems. This happens during the design phase. Current system has capacity	July 2024 - November 2024



# Summary of Proposed Building Upgrades (Continued)

Upgrade	Description	Est. Timeline
Custom Economizers	Purchase and install custom CanFab economizers for Lennox HVAC units. This can happen while school is in session.	January 2025 - June 2025
Solar Panel Design Plans	Collaborate with engineers to determine the appropriate solar PV system size to offset 100% of the school's projected energy usage post HVAC retrofit (or as close as possible). Seek Permits.	July 2024 - November 2025
Solar Panels	Install a 43.34 - 45.45 kW solar PV system on the building's roof.	Summer 2026
Reroof site and structurally upgrade as needed.	Determine during design period.	June 2025 - September 2025
Seek Permits as needed	Submit to the city for permits as needed.	November 2024 - April 2025

*Note: Timeline specifically designed to avoid interferences with learning during the school year.*



# Summary of Impacts



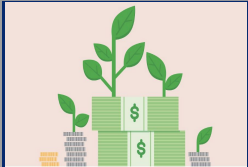
## Improved Classroom Environment

- Lower CO2 levels and increase outside air distribution
- Stabilized temperatures for student/teacher comfort



## Enhanced Student Well-Being & Productivity

- Fewer disruptions from temperature fluctuations lead to improved focus, engagement and academic achievement



## Financial Advantages

- Minimum of \$16,000/month savings in energy costs from solar install
- Reallocate funds for program enrichment & curriculum development



## Sustainable Future

- Upgrade HVAC system is Energy efficient
- Solar system generates renewable energy to power our energy efficient building and reduces our reliance on the grid.

# Summary of Next Steps for Implementation



Apply for **CA Schools Healthy Air, Plumbing, and Efficiency Program** (CalSHAPE) to support \$1.25m in upgrades at ECHS Garena



Utilize **Energy CLASS Prize Phase 2** to support new energy positive building and model green initiatives for other urban school districts



# Summary of Next Steps for Implementation



Apply for **Renew America's Schools** prize with a cohort to support solar panel installation on all ECS facilities

**#1** **Investment  
Tax Credit  
(Sec 48)**

Three icons are arranged vertically on the right side of the box. The top icon shows a sun with rays and a solar panel. The middle icon shows a battery with a lightning bolt and a plus sign. The bottom icon shows a school building with a flag on top.

Apply for **tax credits** to help recover the cost of the solar installation, saving money to duplicate at another school

# Community Engagement

Key elements utilized by ECS to maximize **effective stakeholder feedback**



Actively listen to diverse perspectives, concerns and priority goals in order to foster inclusion while ensuring decisions align with community needs.



Establish shared goals, define terms and identify data sources for reducing energy emission to achieve net positive energy operations.



Develop a communication plan, identify effective messaging channels and regularly share updates on goal progress.



Conduct regular assessments while evaluating strategies and resource allocated to ensure effective net positive energy operations.