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# Energy Master Plan

## *LAGUNA BEACH USD*

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P2S LP

07/25/2024



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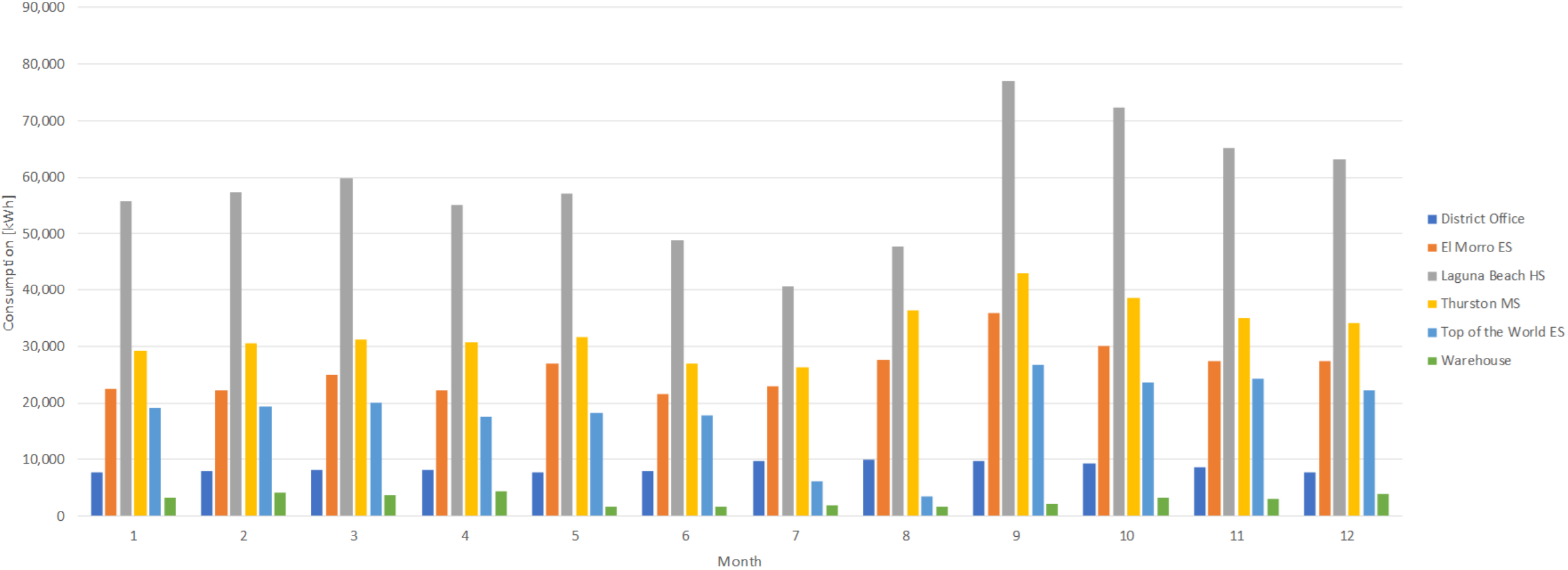
# Agenda

- Existing Consumption Overview
- Carbon Emissions
- EUI Comparison
- Cost Analysis and Recommendations
- Funding and Incentives
- Facilities
  - ✓ District Office
  - ✓ Warehouse
  - ✓ Laguna Beach High School
  - ✓ Thurston Middle School
  - ✓ Top of the World Elementary School
  - ✓ El Morro Elementary School

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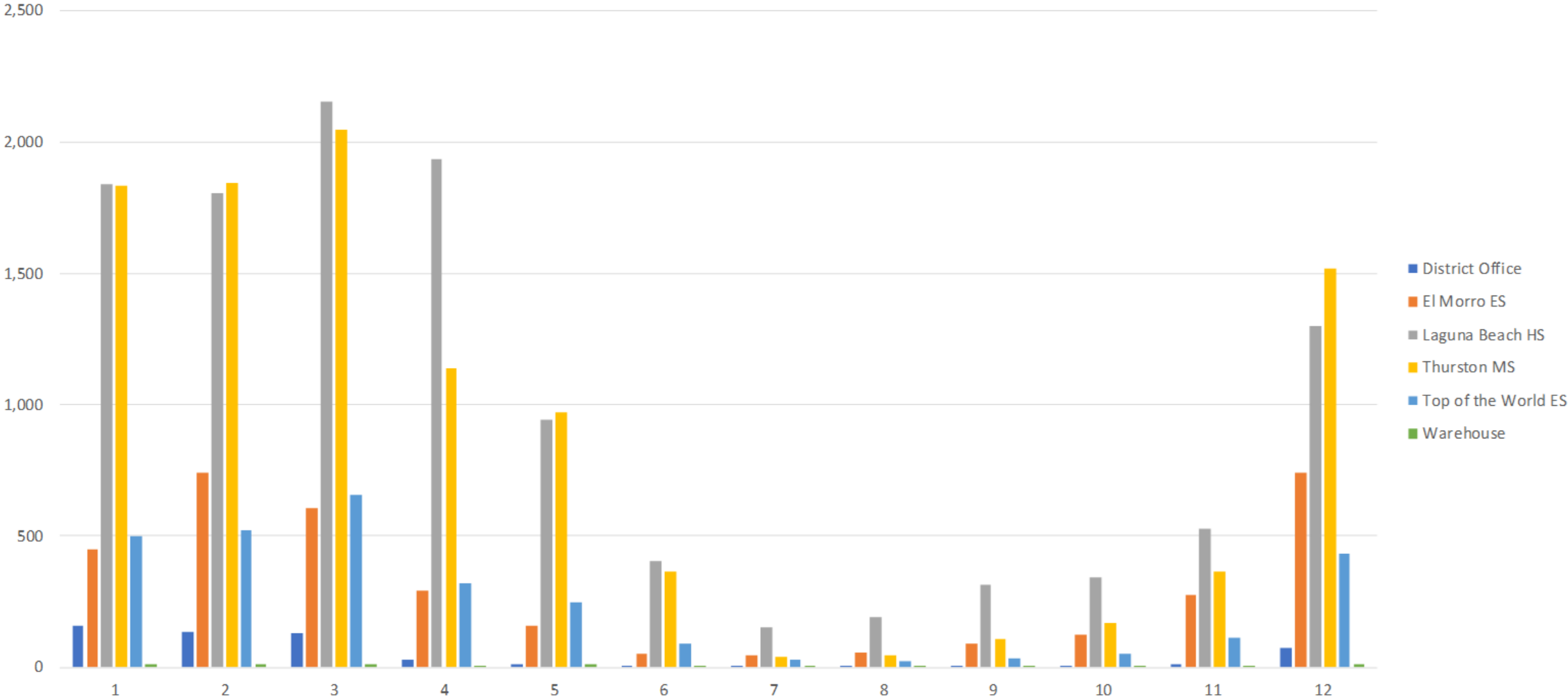
# District Electrical Consumption



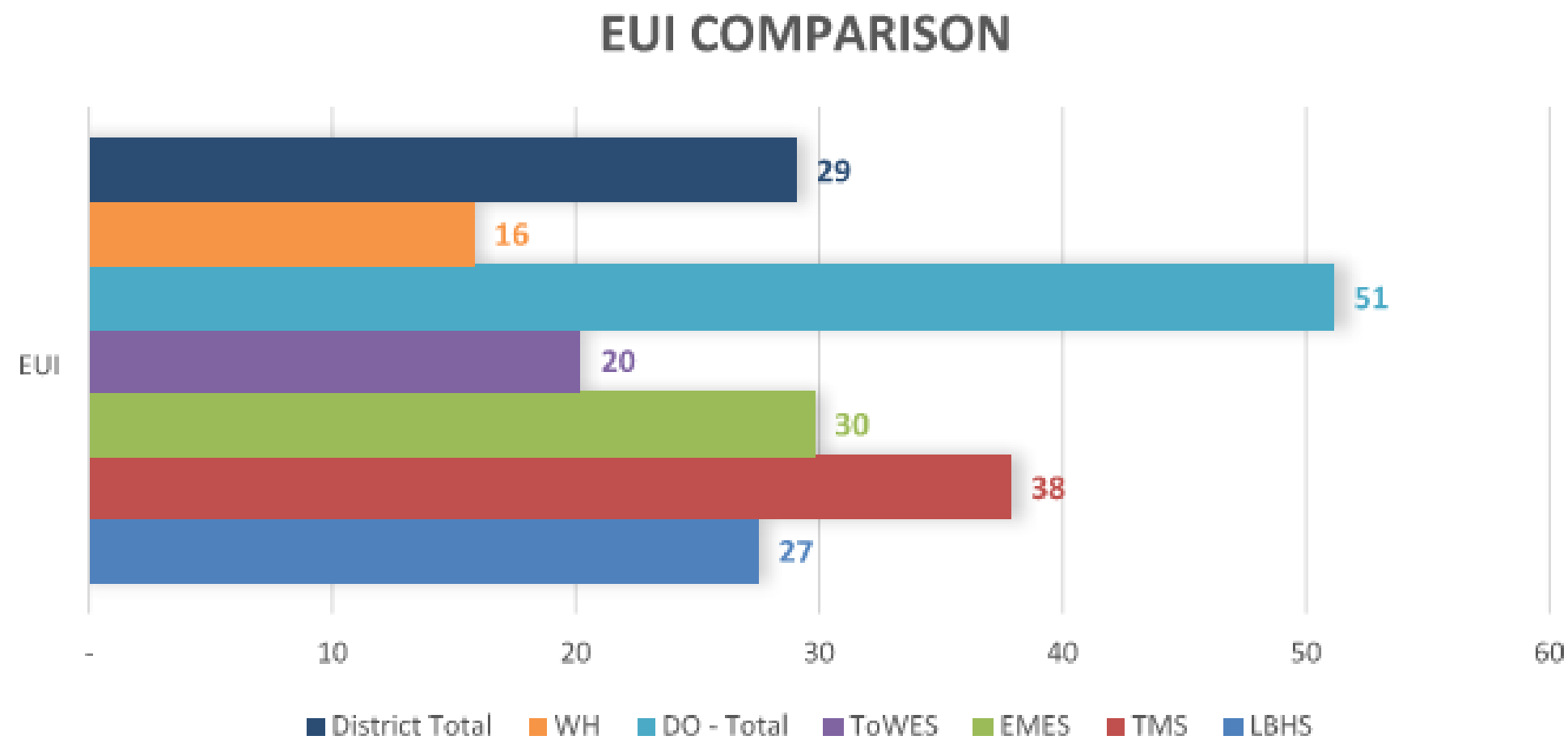
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# District Natural Gas Consumption

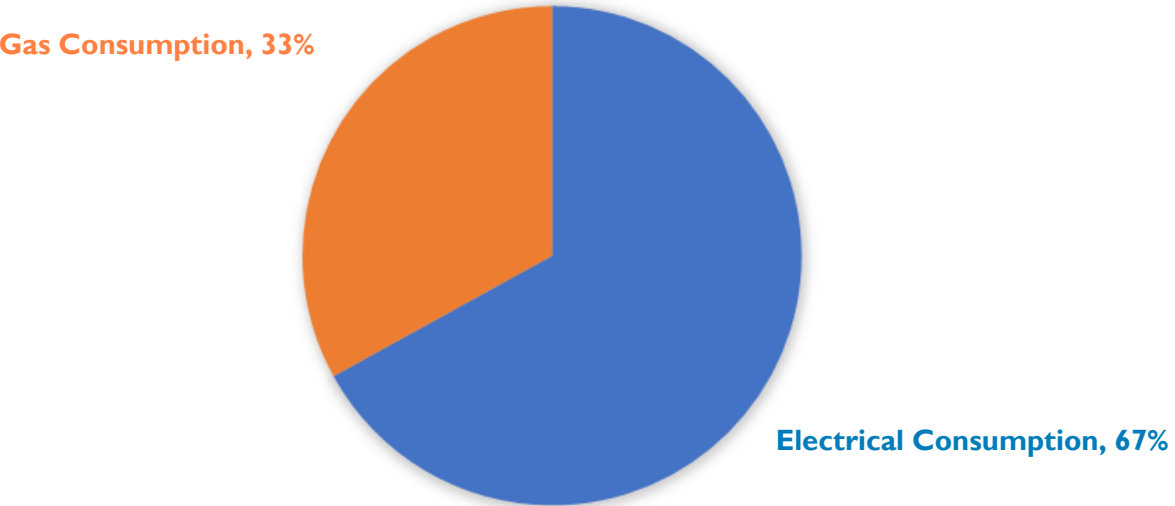


# Energy Use Intensity (EUI)

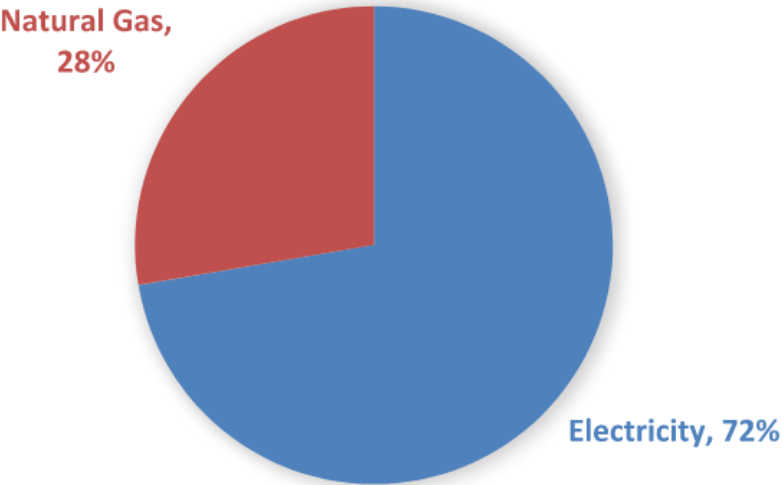


# District Carbon and Energy

DISTRICT TOTAL ENERGY USE



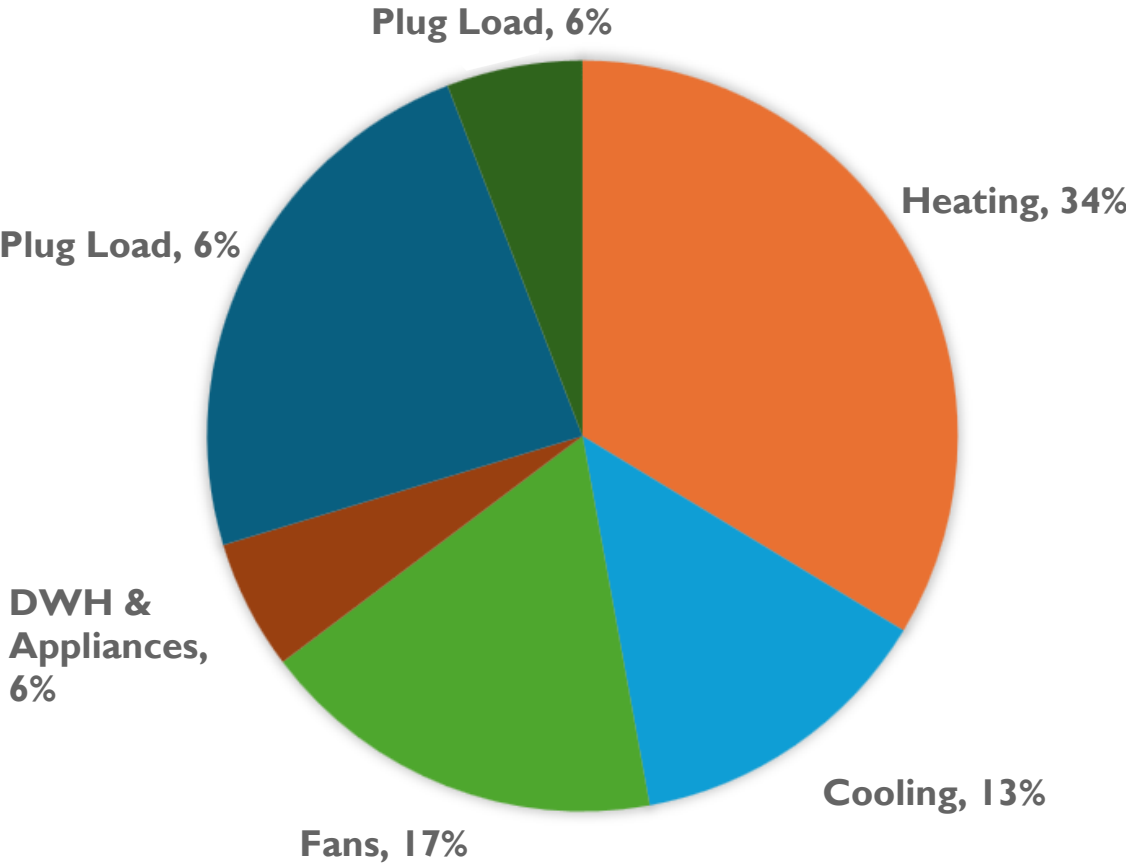
LBUSD CARBON EMISSION



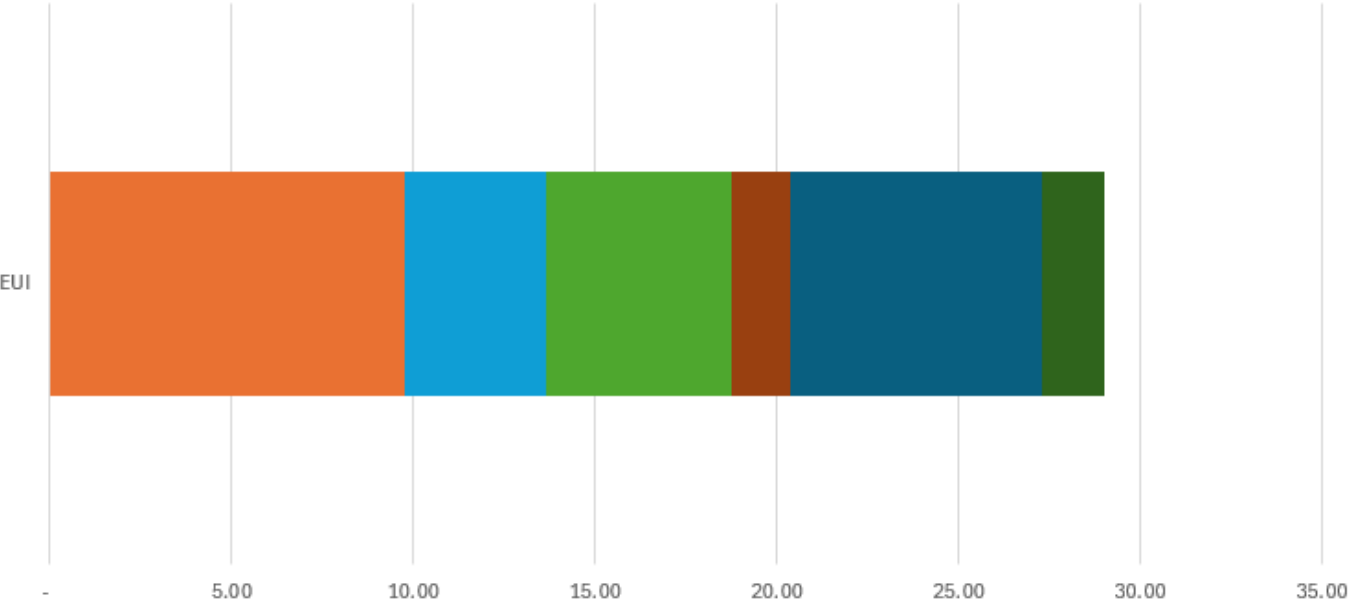
Fuel Source	Consumption [kBtu]	Emission [lbs of CO2]
Electricity	6,016,506	877,613
Natural Gas	2,965,700	346,987
Total	8,982,206	1,224,600

# Total Energy End Use Breakdown

TOTAL PERCENT END USE



TOTAL EUI Breakdown



# Energy Conservation Measures

- iAIRE Solar
- Controls and Scheduling
- HVAC Replacement with Heat Pump
- Domestic Water Heater Replacement
- Lighting Upgrades
- Solar Photovoltaic and Storage
- EV Charging
- Heat pumps w/ Energy Recovery for High OSA
- Windows/Film/Insert
- Exterior Wall and Roof Envelope Upgrades
- Ceiling Fans



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# Summary of Recommended Measures

	Cumulative Annual Electric Usage (kWH)	Cumulative Annual Gas Usage (Therms)	Cumulative Annual Operational Energy (MBH)	Cumulative Annual Operation Carbon (lbs)	Annual Utility Cost	Implementation Cost
Baseline	1,780,221	29,281	9,002,214	1,228,070	\$560,548	-
Scheduling Updates	1,655,017	29,281	8,575,017	1,022,196	\$547,631	N/A
Lighting Upgrades	1,366,321	29,281	7,589,986	1,022,196	\$437,503	\$1,572,758
PV and BESS	-665,317	29,281	658,037	11,659	\$127,604	\$6,709,662
EV Stations	-140,352	29,281	2,449,218	272,776	\$258,845	\$356,500
HVAC Replacement	10,719	4,909	527,427	62,761	\$252,457	\$10,591,554
DWH Replacement	123,089	0	419,978	61,224	\$276,966	\$232,000
Total – By 2030	123,089	0	419,978	61,224	\$276,966	\$19,462,474

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# Summary of Energy and Decarbonization Plan

	Annual Electric Usage (kWH)	Annual Gas Usage (Therms)	Annual Operational Energy (MBH)	Annual Operation Carbon (lbs)	Annual Utility Coast	Implementation Cost
Baseline	1,780,221	29,281	9,002,214	1,228,070	\$560,548.	-
Summer 2025	1,366,321	29,281	7,589,986	1,022,196	\$437,503	\$1,572,758
Summer 2026	941,537	29,281	6,094,923	805,561	\$426,013	\$3,284,273
Summer 2027	-136,963	29,281	2,415,081	269,115	\$257,927	\$3,917,889
Summer 2028	-72,126	17,056	1,459,505	163,680	\$250,688	\$6,055,164
Summer 2029	10,719	4,909	527,427	62,761	\$252,457	\$4,400,391
Summer 2030	123,089	0	419,978	61,224	\$276,966	\$232,000
Total	123,089	0	419,978	61,224	\$276,966	\$19,462,474

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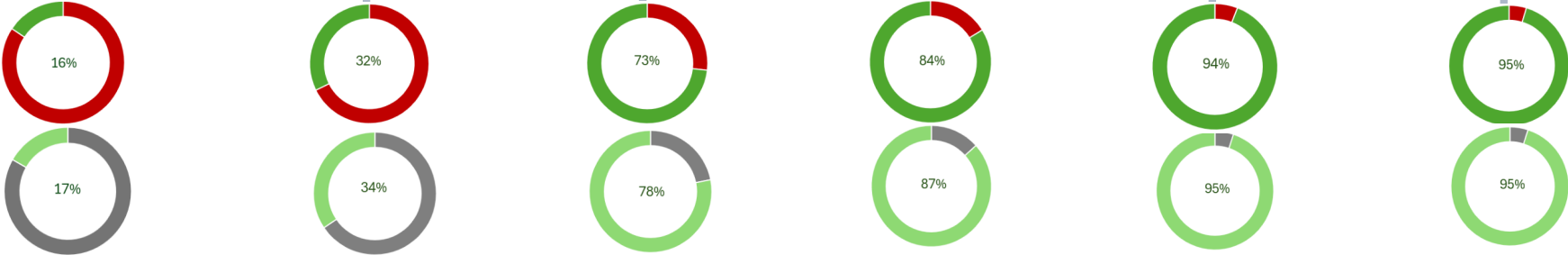
# Energy Conservation Measures

Implementation cost (\$Mil) / Annual Utility Saving (\$K)

	2025		2026		2027		2028		2029		2030	
Measures	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2
Lighting Upgrades												
PV BESS												
EV Charging Station												
HVAC Replacement with Heat Pump												
Domestic Water Heater Replacement												

Energy Goal Progress

Carbon Goal Progress



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# Funding and Incentives

- Photovoltaic Systems
  - Inflation Reduction Act (IRA)
- Energy storage system
  - Inflation Reduction Act (IRA)
- Electric Vehicle System
  - SCE Charge Ready Program
  - CALeVIP Rebate Program
  - California Air Resource Board (CARB) - Low Emission School Bus Program

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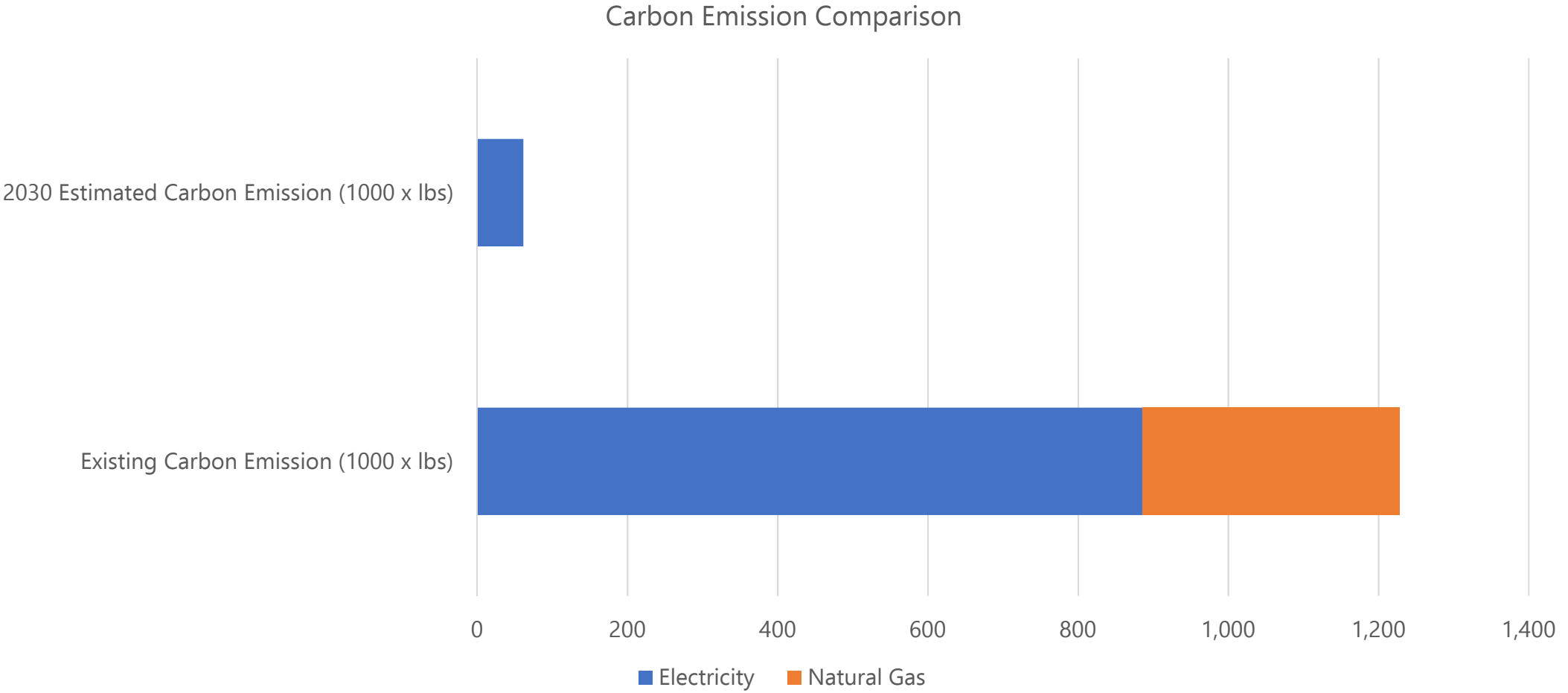


# Funding and Incentives

Proposed Site	EV Chargers (SCE Charge Ready)	EV Chargers (CALeVIP)	PV & BESS System (IRA)
District Office	\$23,800	\$49,000	\$155,527
Laguna Beach High School	\$0	\$0	\$675,138
Thruston Middle School	\$13,600	\$28,000	\$496,929
Top of the world ES	\$17,000	\$35,000	\$129,295
El Morro Elementary School	\$17,000	\$35,000	\$275,707
LBDO Warehouse	\$101,200	\$210,000	\$346,188
Total	\$172,600	\$357,000	\$2,078,784

LBUSD	Total Buses replaced	Total Vans replaced	Total Funding per Bus (CARB)	Low Emission School Bus Program (CARB)
Laguna Beach Unified School District	12	7	\$20,000	\$240,000

# 2030 District Carbon Emission



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# Questions?



**Energy Master Plan**  
*Laguna Beach USD*

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