



CITY OF LOS ANGELES

October 2023

Decarbonizing LA's Existing Municipal Buildings: A Roadmap to Efficient and Healthier Buildings



1st City of Los Angeles LEED certified project.
Sun Valley Branch Library
LEED-Gold 2005



Silver Lake Branch Library
LEED Platinum 2010



Hollenbeck Area Police Station
LEED Gold 2010



LADOT Bus Maintenance Facility
LEED Platinum 2020



MAYORAL GOALS & REPORTING COUNCIL MOTIONS

Council File No.

21-1039

Creation of a building decarbonization plan and sustainable municipal solar and storage program – BOE Lead

21-0683

Retrofitting municipally owned buildings to achieve carbon neutrality without offsets by 2030 – BOE Lead

22-0530

Grid Impact analysis for fully electrified City facilities, and partnership opportunities related to commercial electrification. – BOE/LADWP/LAWA LED

21-1039-S2

To meet and exceed 2022 California Building Energy Efficiency Standards to ensure that all future city owned sites, facilities or park-sites are built to be net-zero projects that maximize solar energy generation and storage on-site – BOE Lead

Other Related Council Motions

21-0432

Generating at least 3 MW of solar energy and 1 MW of battery storage at LA Zoo – LADWP Lead

21-0352

LA100 - LADWP to develop a Strategic Long Term Resource Plan. The goal of this plan is to achieve 100% carbon-free energy by 2035 in a manner that is equitable. – LADWP Lead

21-1042

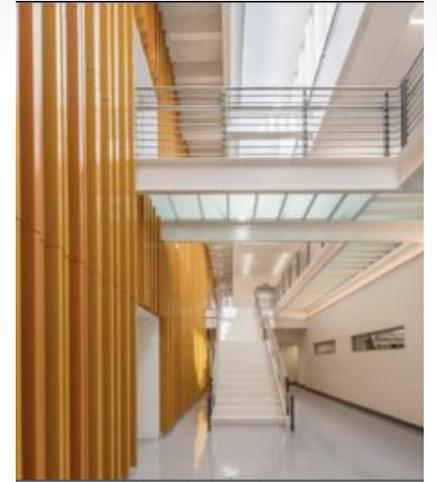
Implement hyper-local climate change mitigation and neighborhood resilience efforts/plans (CEMO, NCs) – CEMO Lead

21-1249

GSD to Expand solar energy, energy storage, and EV charging stations at city facilities and sets a long-term vision for renewable energy-powered grid by 2035 – GSD Lead



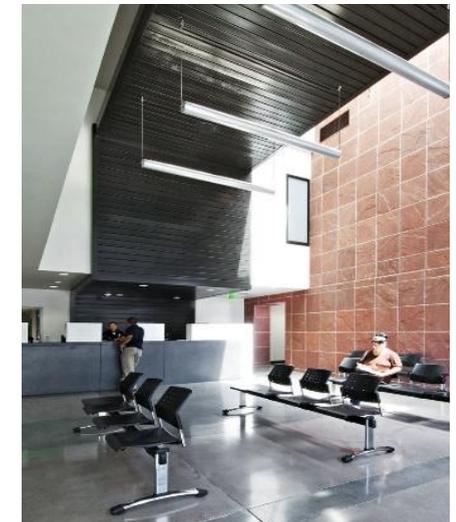
Los Angeles CleanTech Incubator- LEED Platinum 2019



LAPD Metropolitan Division Facility LEED Platinum 2016



World's 1st LEED Platinum Library 2005
Lake View Terrace Branch Library



LAPD Westlake Area Police Station LEED Gold 2008

L.A.'s 5 ZEROS

Emissions must decline everywhere, as soon as possible. L.A.'s Green New Deal (GND) puts the city on the road to a zero carbon future across the board.



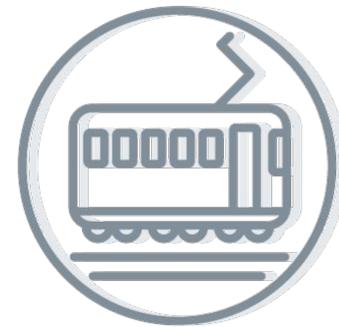
Zero Carbon Buildings

*100% net-zero
carbon new buildings
by 2030 & all
buildings by 2050*



Zero Carbon Grid

*100% renewable
energy by 2035*



Zero Carbon Transportation

*80% zero emission
vehicles in the city
by 2035 & 100% by
2050*



Zero Waste

*95% landfill
diversion rate
by 2035 &
100% by 2050*



Zero Wasted Water

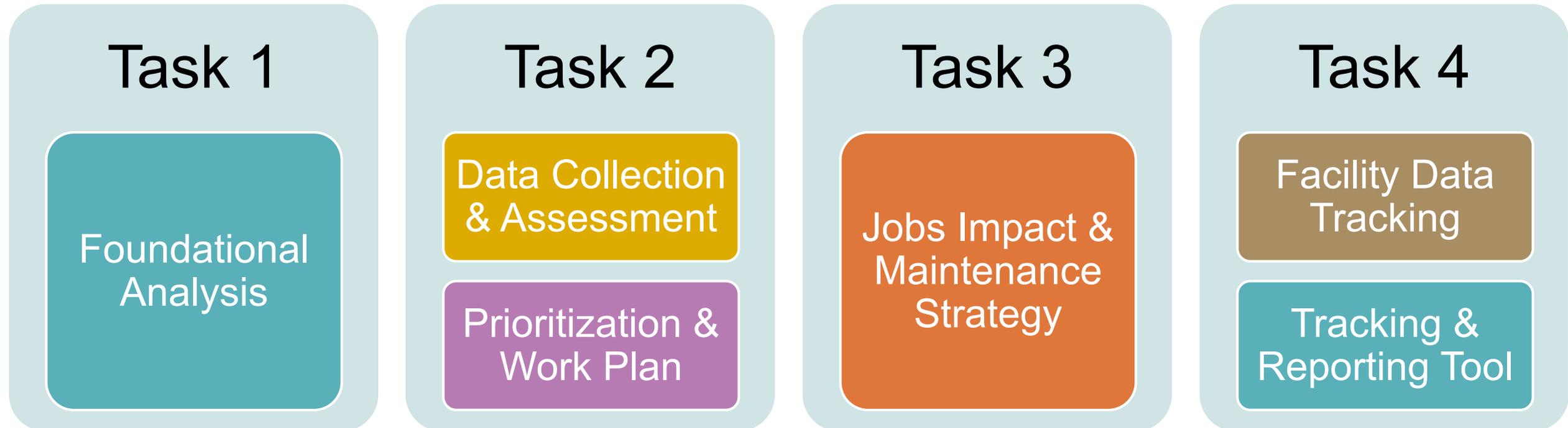
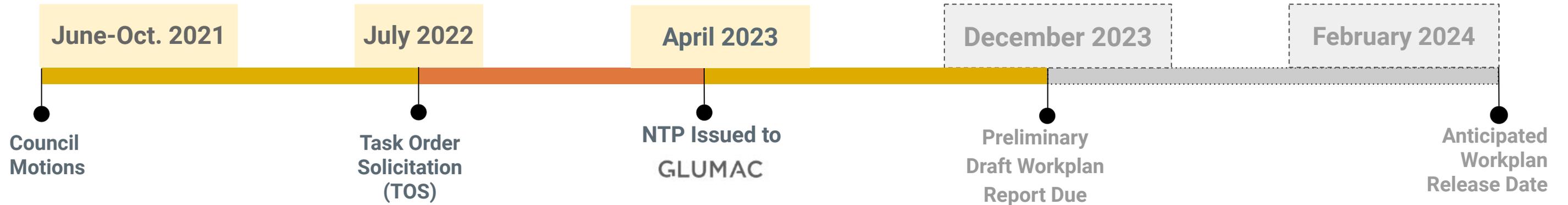
*100% of our
wastewater
recycled by 2035*

EXISTING MUNICIPAL BUILDING DECARBONIZATION



EXISTING BUILDING DECARBONIZATION WORKPLAN

SUMMARY SCOPE OF WORK

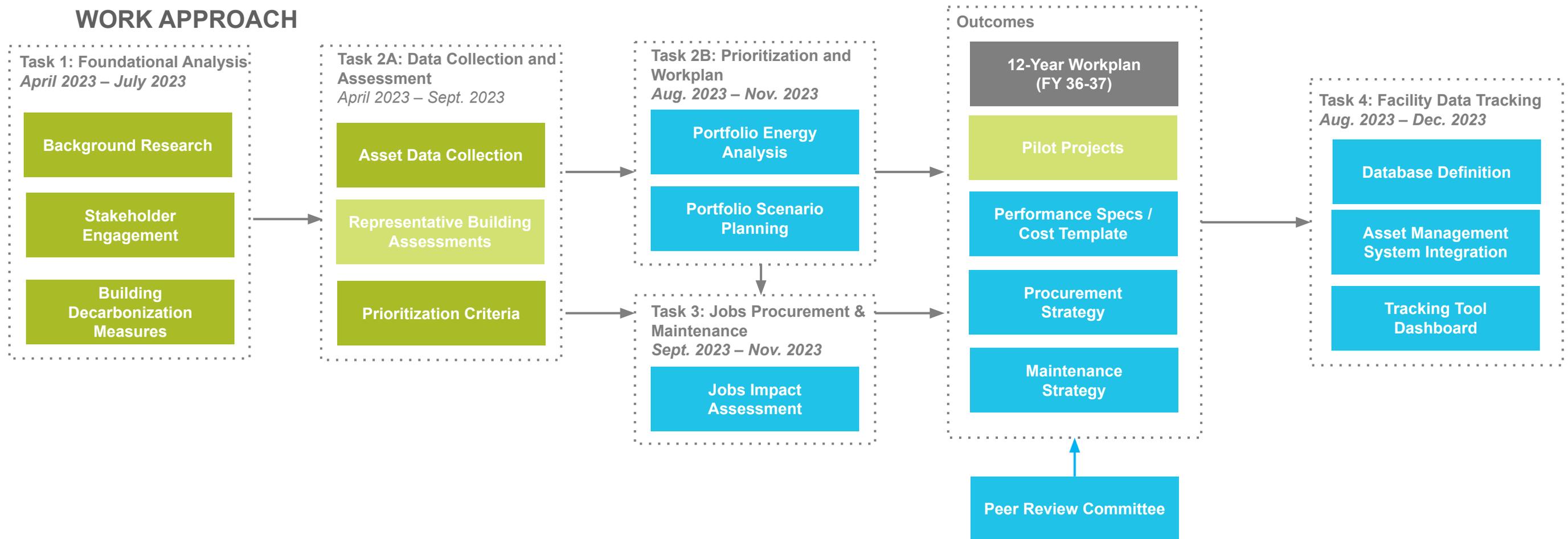


PROJECT MANAGEMENT

PROJECT WORKFLOW STATUS UPDATE



WORK APPROACH



EXISTING BUILDING DECARBONIZATION WORKPLAN

DEFINITION OF BUILDING DECARBONIZATION FOR CITY FACILITIES

EXISTING BUILDING DECARBONIZATION

Building System Electrification

- No use of fossil fuel burning equipments at City Facilities
- Replace all gas powered HVAC, water-heaters, cooking range with heat-pump and all electric systems.

+

Strategic Energy Efficiency Upgrades

- LED Lighting replacement
- Strategic building envelope upgrades

+

Solar Energy where feasible

- On-site NEM (Net Energy Metered) Solar
- Minimum roof upgrades required for

+

Battery Energy Storage (BESS)

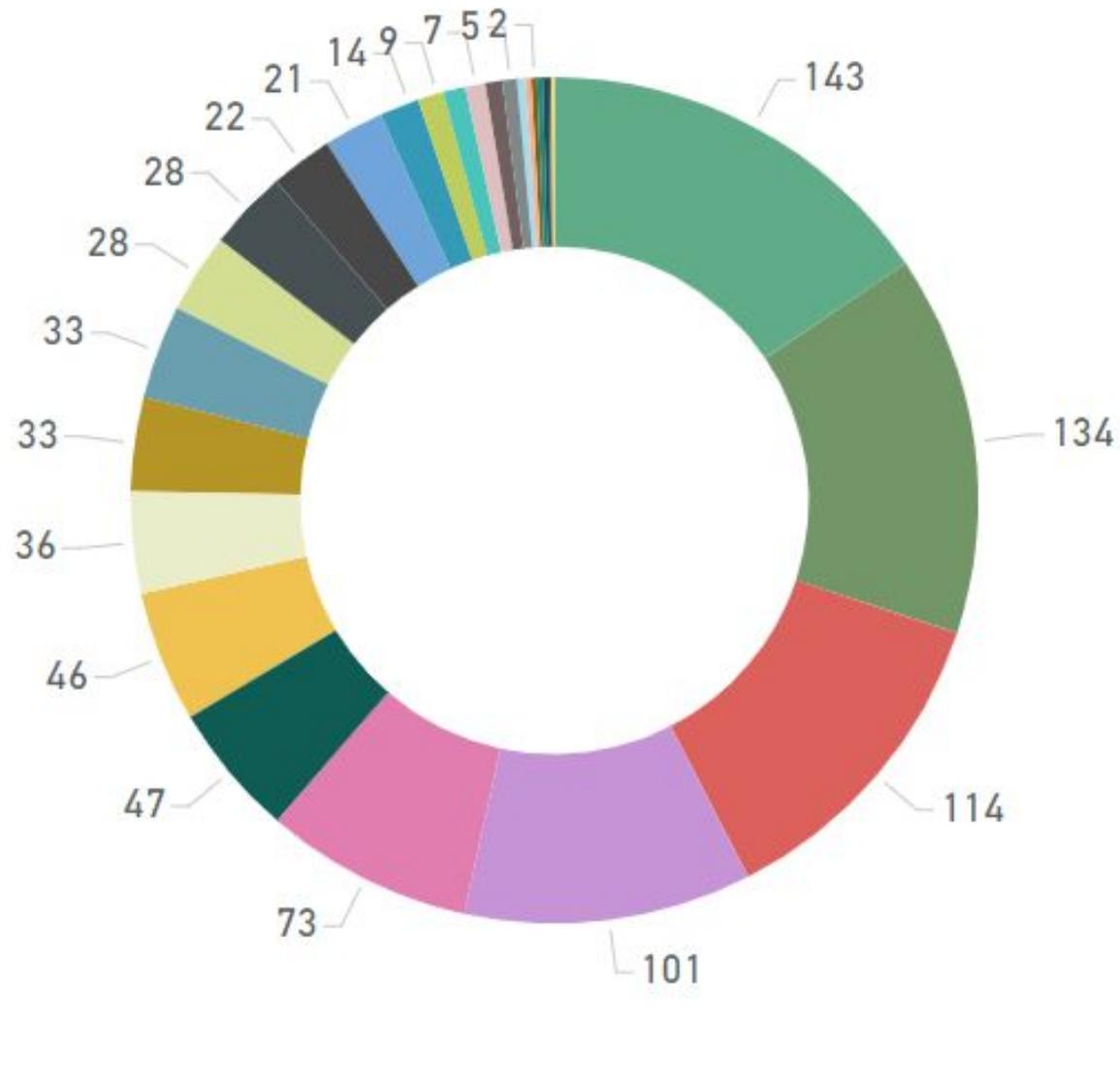
- Prioritize Cooling Centers, Public facing facilities and Emergency Facilities
- Back-up power for Critical load only for a 4-hr duration

EXISTING BUILDING DECARBONIZATION WORKPLAN

BUILDING PORTFOLIO BREAKDOWN

Buildings by Usage Type

TOTAL MUNICIPAL BUILDINGS TO DATE: 1,000+



Usage Type

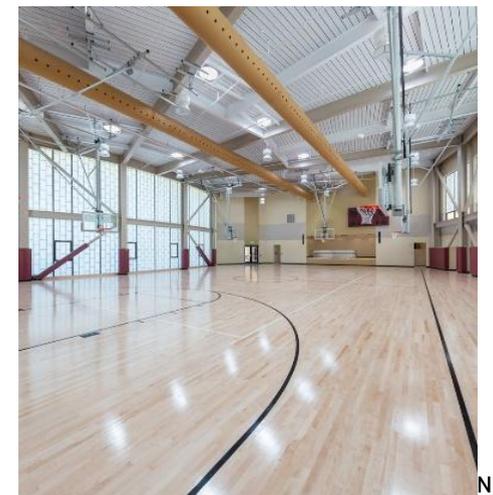
- RECREATION CENTER
- MAINTENANCE
- FIRE STATION
- OFFICE
- LIBRARY
- RESIDENTIAL
- COMMUNITY CENTER
- PARKING
- CHILD CARE CENTER
- SENIOR CENTER
- MUSEUM
- WAREHOUSE/STORAGE
- POLICE STATION
- AQUATIC CENTER
- THEATER
- ANIMAL SHELTER
- POLICE OPERATIONS
- COMMUNICATION
- POLICE TRAINING
- LAB
- ASSEMBLY
- DETENTION
- PLANT
- RESTROOM
- SHOPPING CENTER
- CHURCH
- RESTAURANT



North Valley Animal Shelter
LEED Gold 2008



East Valley Multipurpose Center
LEED Silver 2010



Woodland Hills Recreation Center
LEED Gold 2018

EXISTING BUILDING DECARBONIZATION WORKPLAN

BUILDING PORTFOLIO HIGHEST NATURAL GAS USERS

Facility	2022 Usage (Therms) ▼	Percent of Total
STREET SERVICES ASPHALT PLANT#1	776,083	18%
CIVIC CENTER STEAM PLANT	491,130	11%
POLICE ADMINISTRATION BUILDING (PAB)	181,748	4%
EXPO CENTER	140,700	3%
WESTCHESTER DISTRICT STREET MAINTENANCE YARD	86,773	2%
VAN NUYS SHERMAN OAKS PARK	81,377	2%
CENTRAL LIBRARY	81,336	2%
NORTH HOLLYWOOD FLEET SERVICE REPAIR FACILITY	78,261	2%
C ERWIN PIPER TECHNICAL CENTER (PIPER TECH)	72,256	2%
EAST VALLEY SOLID WASTE RESOURCES FACILITY	71,880	2%

EXISTING BUILDING DECARBONIZATION WORKPLAN

PRIORITIZATION CRITERIA

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The decarbonization workplan will establish a decision making framework that will guide future investments in City owned facilities. The workplan will prioritize reducing GHG emissions while ensuring the City is equitably investing across its disadvantaged communities.

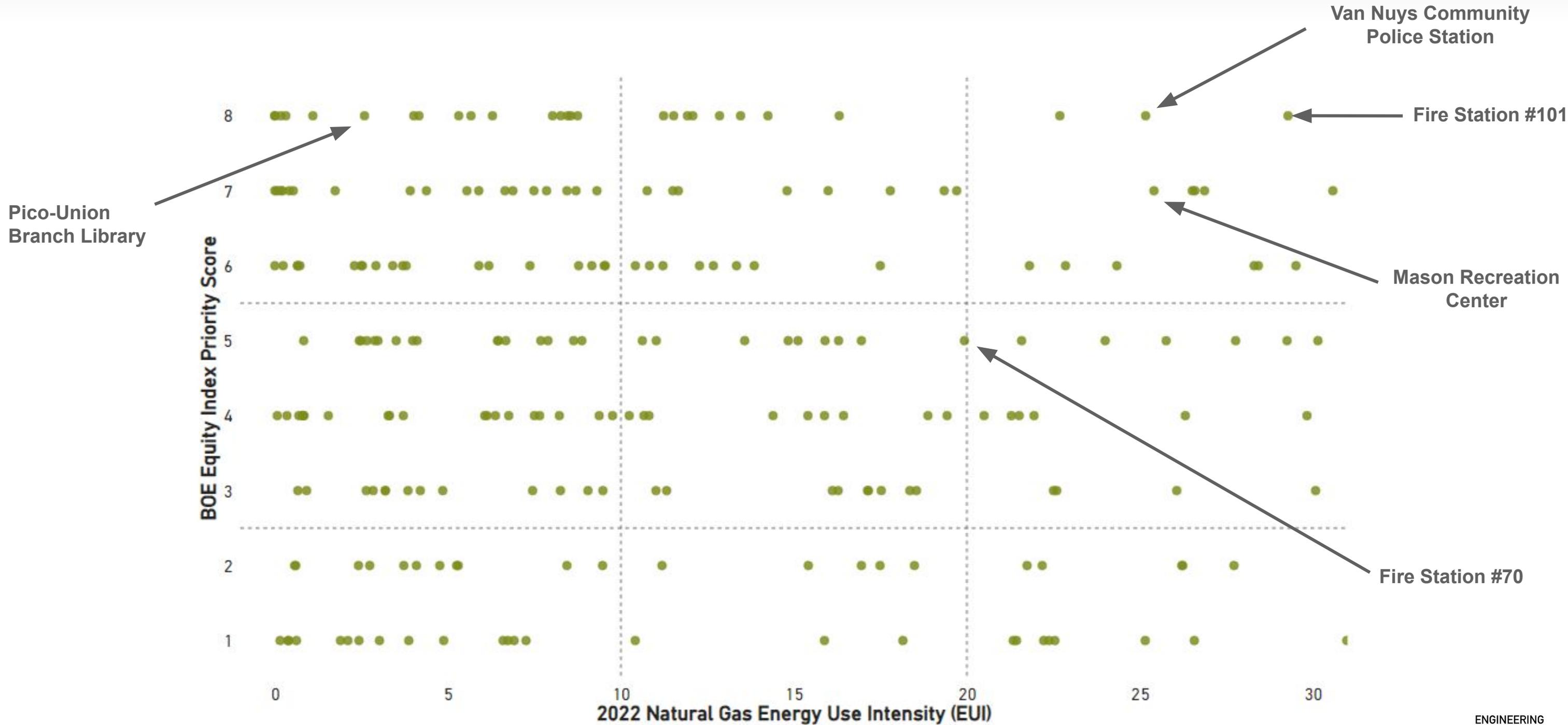
Considerations

- GHG Emissions Reduction
- Existing Conditions & Maintenance Needs
- Departmental Priorities
- Equitable Investment
- Capital Costs and Cost Effectiveness
- Resilience Needs

		Low	Medium	High		
Equity	High			Higher Priority	High	
	Medium				Medium	
	Low	Lower Priority			Low	
		Emissions & Cost				

EXISTING BUILDING DECARBONIZATION WORKPLAN

PRIORITIZATION CRITERIA



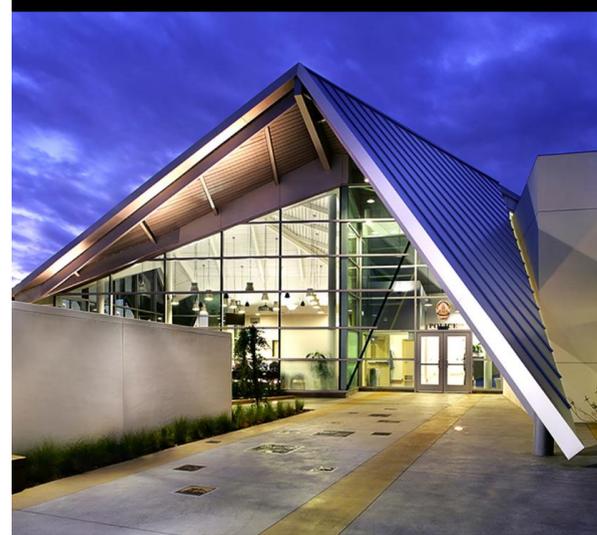
DECARBONIZATION WORKPLAN

REPRESENTATIVE BUILDING ASSESSMENTS

PROCESS

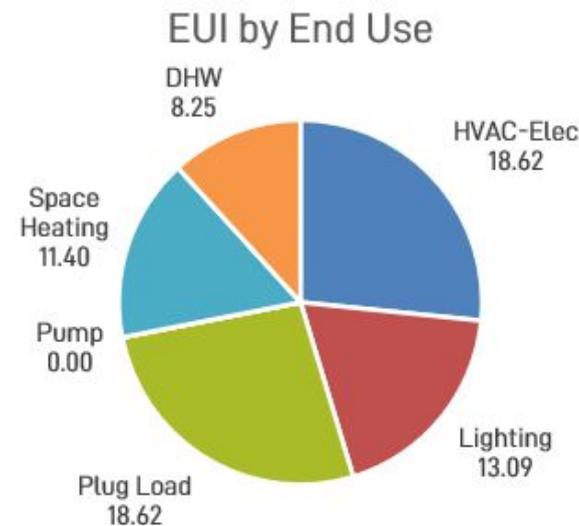
1. 25 representative facilities
2. Evaluate building energy by end use and associated emissions
3. Identify electrification and emissions reductions projects
4. Apply energy use breakdown and associated measures across building types

Topanga Canyon Police Station



LEED Gold 2009
Carde Ten Architects

Facility Name	Topanga Police Department
City Department	Police
Building Type	Police Department
Year	2009
GSF	62,800
Levels	2
Hours of Operation	24/7/365
End Use	Building EUI [kBtu/SF/yr]
HVAC	18.6
Lighting	13.1
Plug Load	18.6
Pump	0.0
Space Heating	11.4
DHW	8.3
Total	70.0



BUILDING AUDIT SUMMARY

Representative Police Station | Topanga Police Department

The following document provides summary information about key building systems and building energy information for a representative Police Station in the City of Los Angeles.

BUILDING INFORMATION

Facility Name	Topanga Police Department
Building Address	21501 Schoenborn Street, Canoga Park, CA 91304
City Department	Police (LAPD)
Building Type	Police Station
Year	2009
Gross Square Feet	62,800
Levels	2
Hours of Operation	24/7, 365 days

Topanga Police Department consists of multi-level main office building and a separate maintenance shop. The main building houses offices, a gym, restrooms, and locker rooms. The maintenance shop houses service bays, a small break room and locker rooms. While this is a police department, no significant plug loads were observed (such as a dispatch center). There is a vehicle washing station, though it does not use natural gas.

BUILDING DECARBONIZATION MEASURES

The following building decarbonization measures were identified at the Topanga Police Department station.

Table 1: Identified Building Decarbonization Measures

Measure	Electricity Savings (kWh)	Natural Gas Savings (therms)	Annual Cost Savings (\$)	Estimated Project Cost (\$)	Estimated Utility Incentive (\$)	Simple Payback (yrs)	GHG Emission Reduction (MTE)
High Performance RTU	69,802	0	\$14,371	TBD	\$0	TBD	TBD
Air to Water Heat Pump	-34,720	5,183	\$1,252	TBD	\$0	TBD	TBD
Heat Pump Water Heater	-51,635	7,157	\$970	TBD	\$0	TBD	TBD
LED Lighting - Interior	40,430	0	\$8,490	TBD	\$3,234	TBD	TBD
LED Lighting - Exterior	26,078	0	\$5,476	TBD	\$2,086	TBD	TBD

It is recommended that mechanical and domestic hot water projects are completed in roughly 10-12 years as equipment reaches the end of its expected useful life. The Air-to-Water Heat Pump (AWHP) requires ventilation air and is recommended to be installed outside of the building either on the roof or in a surface mechanical yard.

The Heat Pump Water Heater project should be validated during a follow-on engineering study. If hot water loads are determined to be minimum one or two 100-gallon heat pump water heaters can be installed inside the building. Alternatively, a rooftop condensing unit should be installed to provide great heating capacity, existing hot water tank can be reused.

The building has partially completed and LED retrofit of interior lighting fixtures. It is recommended the City replace all remaining non-LED interior fixtures and all exterior lighting fixtures which are current HID.

DECARBONIZATION WORKPLAN

FUNDING & FINANCING

The consultant team is evaluating various implementation strategies that the City of LA can leverage including delivery methods and funding & financing. A combination of multiple strategies will be required to meet the City's 2035 climate goals.

	Deferred Maintenance End of Life Replacement	Capital Improvement Projects Internal Financing	Capital Improvement Projects External Financing
Summary	Integrate decarbonization measures into general ongoing facility maintenance. Electrify equipment at end of life.	Leverage existing and new funding sources	Leverage external funding & financing sources
Applications	Simple building upgrade projects including LED bulb replacements, heat pump water heaters	Any project including whole building retrofits, major HVAC upgrades	Solar PV + Battery Storage, HVAC Upgrades, LED Retrofits, Building Electrification
Potential Funding	<ul style="list-style-type: none"> • General Funds • Other City Funding 	<ul style="list-style-type: none"> • General Funds • Other City Funding • Debt Financing • Bond Measures 	<ul style="list-style-type: none"> • Public Private Partnership (P3) • Performance Contracting (ESPC) • Grants
Delivery	Minimal or no design required	Design-Bid-Build, Design-Build	Design-Build
Benefits	Aligns with existing capex plans. Marginal costs for electrified alternatives	Low cost of capital. Allows for packaging of other building upgrades	Turn key project delivery will allow the City to implement more projects in a shorter period of time
Risks	Emergency equipment failures require natural gas equipment to be installed	Ability to secure enough funding. Availability of internal project management engineering staff	Higher cost of capital for external financing. Less control over projects (can be mitigated with performance criteria)
Next Steps	Review asset management budgets. Evaluate no new natural gas policy	Review existing budgets and opportunities for additional funding	Further evaluation of external financing and delivery methods

EXISTING BUILDING DECARBONIZATION PILOT PROJECTS

Phase I Pilot Project Status

	Facility/Project Name	Scope of Work	Lead Agency	Current Status
CD 6	Balboa Sports Complex <i>17015 Burbank Blvd</i>	Electrification + Solar + Energy Storage	BOE	60% Design Complete
CD 14	Benjamin Franklin Branch Library <i>2200 1st St</i>	Partial Electrification + Solar + Energy Storage	BOE	10% Design Complete
CD 1	Cypress Park Branch Library <i>1150 Cypress Ave</i>	Electrification + Solar + Energy Storage + Energy Upgrade	BOE	90% Design Complete
CD 6	Old Fire Station No. 39 <i>14415 Sylvan St</i>	Electrification + Solar + Energy Storage + Energy Upgrade	BOE	90% Design Complete
CD 9	Green Meadows Recreation Center <i>2201 E Washington Blvd</i>	Electrification + Solar + Energy Storage	BOE	This project will be replaced with a new project due to recently installed HVAC systems.

	Facility/Project Name	Scope of Work	Lead Agency	Current Status
CD 13	Las Palmas Senior Citizen Center <i>1820 N Las Palmas Ave</i>	Electrification + Solar + Energy Storage	BOE	70% Design Complete
CD 13	Silverlake Branch Library <i>2411 Glendale Blvd</i>	Electrification	BOE	70% Design Complete
CD 2	Valley Plaza Recreation Center <i>12240 Archwood St</i>	Electrification + Solar + Energy Storage	BOE/ LADWP	40% Design Complete
CD 4	LA Zoo Solar PV System <i>5333 Zoo Drive</i>	Solar + Energy Storage	BOE/ LADWP	Design-Build project. 50% Pre-design complete

EXISTING BUILDING DECARBONIZATION

PILOT PROJECTS

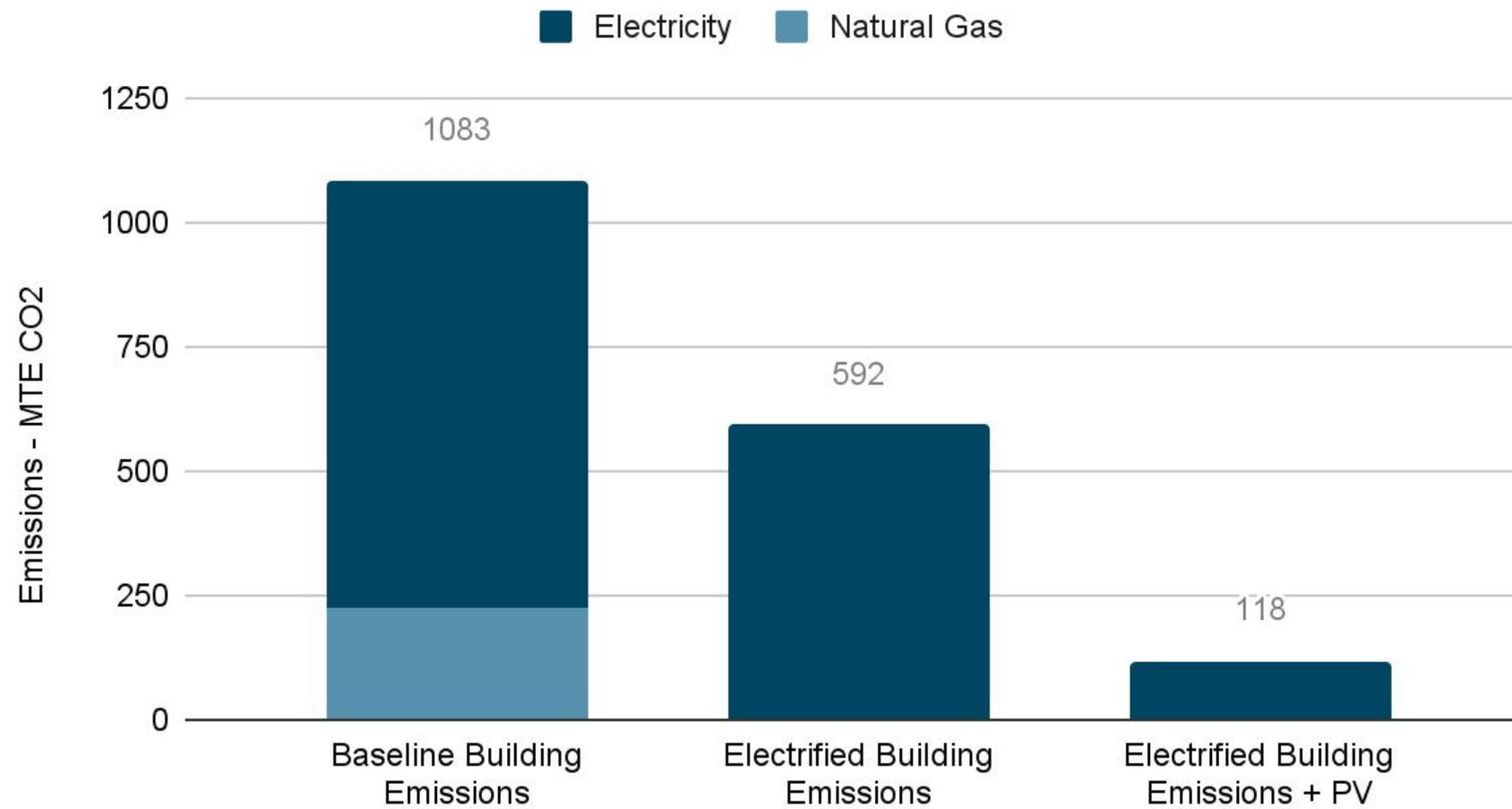
Phase II Proposed Pilot Projects

Facility/ Project Name	City Scope of Work	Project Budget Not to Exceed	LADWP Investment
CD 3 West Valley Municipal Building	Bldg Electri.+NEM Solar+ Enrgy Eff. Upgrades	\$ 2,400,000	\$ 1,600,000
CD 12 Northridge Branch Library	Bldg Electri.+NEM Solar+ Enrgy Eff. Upgrades+ battery Energy Storage	\$3,100,000	
CD 3 West Valley Police Station, Parking & Repair Garage	Bldg Electri.+NEM Solar +Enrgy Eff. Upgrades	\$ 8,000,000	\$ 19,700,000
CD 7 Ritchie Valens Recreation Center	Bldg Electri.+ NEM Solar + Enrgy Eff. Upgrades	\$ 2,200,000	\$ 7,200,000
CD 14 Evergreen Recreation Center Solar PV System	Bldg Electri.+ NEM Solar + Enrgy Eff. Upgrades	\$ 5,800,000	\$ 3,400,000
1% Art (Cultural Affairs)		\$215,000	
Program Contingency		\$894,938	\$1,044,788
GRAND TOTAL		\$22,609,938	\$22,759,788 \$31,900,000

EXISTING BUILDING DECARBONIZATION

PILOT PROJECT EMISSION REDUCTION

Phase I and Phase II Pilot Project Emission Reduction



Outcomes

45%

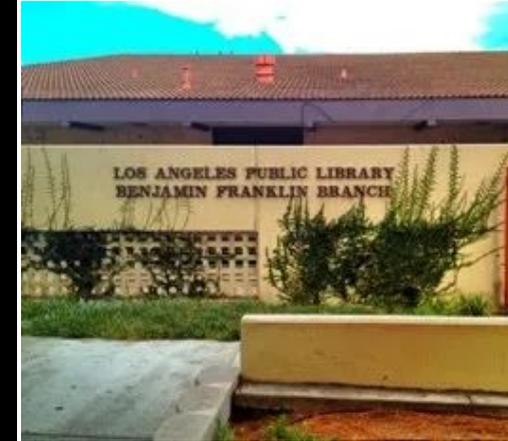
Emissions reduction due to electrification and energy efficiency projects

89%

Emissions reduction with added solar PV

Reported emissions exclude LA Zoo as total onsite electricity and natural gas information was not available.

EXISTING BUILDING DECARBONIZATION PILOT PROJECTS



EXISTING BUILDING DECARBONIZATION PILOT PROJECTS

WHAT'S NEXT

