Municipal Energy Strategy & Proposed Clean Energy Projects

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September 2020


Electrification
#electrifyeverything
Decarbonization

SD sustainability

City of San Diego

Municipal Energy Strategy

A strategic energy plan that puts the City's municipal buildings on the path to zero emissions.

DRAFT

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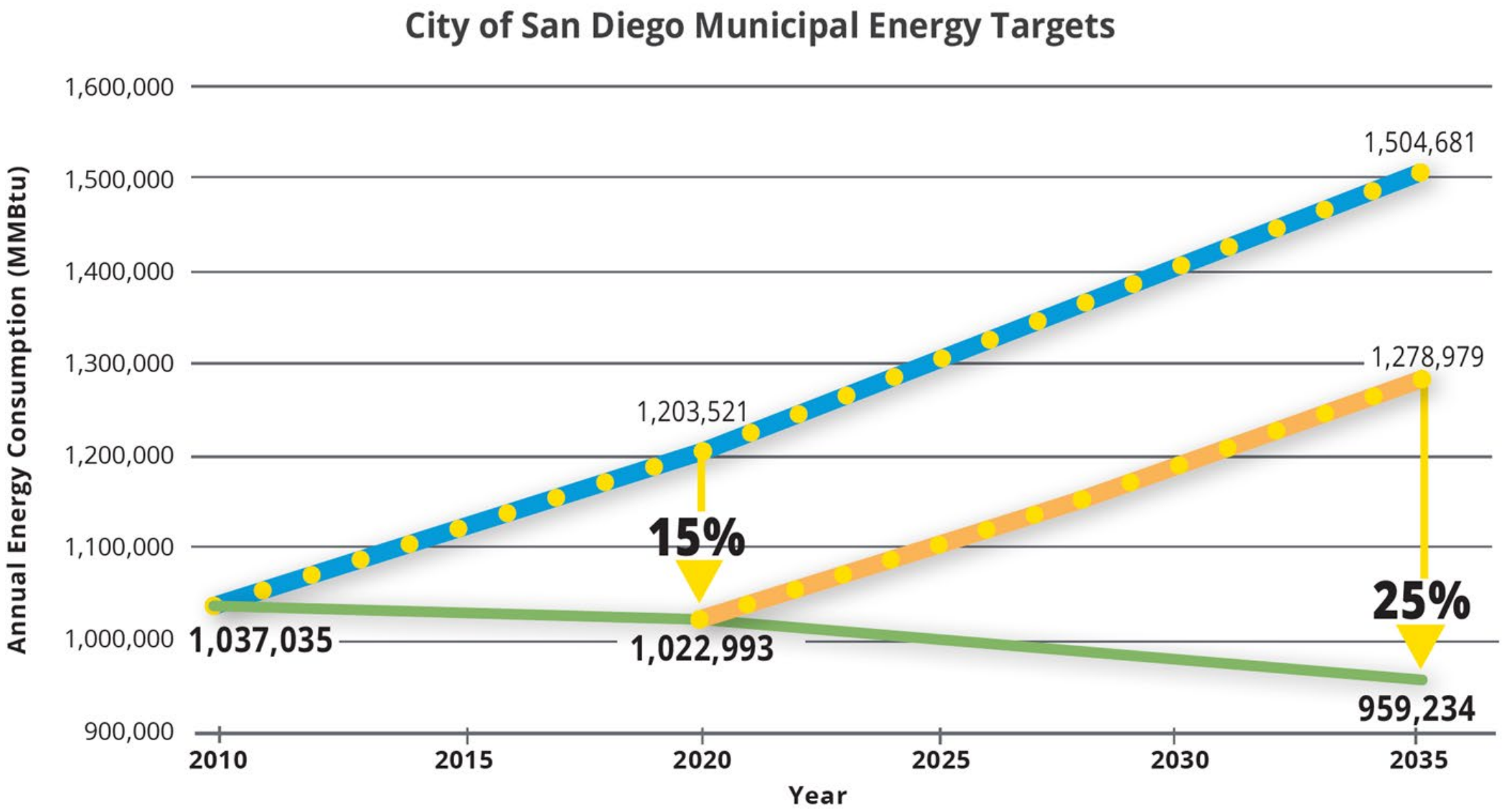
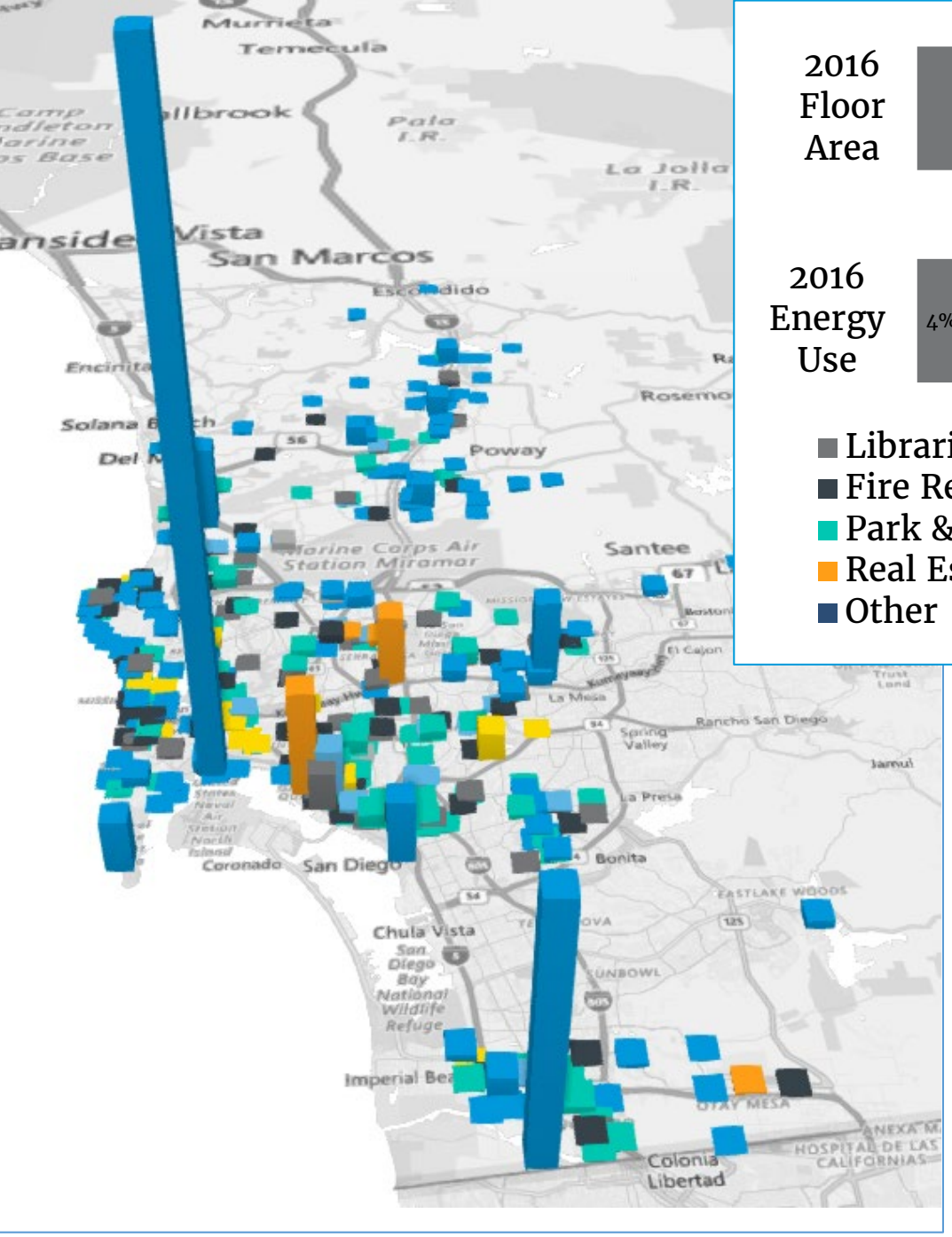
Zero Emissions

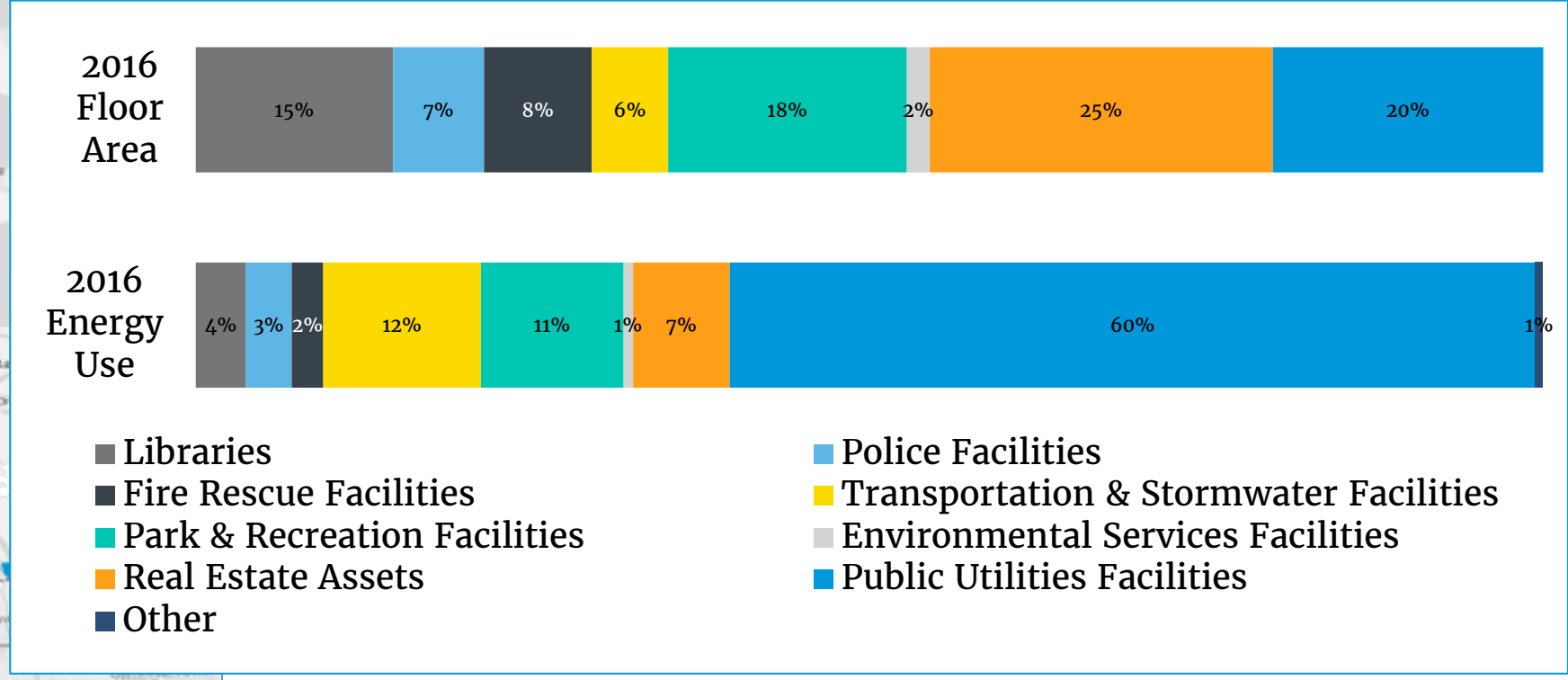
All energy consumed by City facilities is electric, and all electricity is renewable.

- No natural gas space or water heating
- Onsite solar paired with battery storage
- Battery powered backup generators
- Electric vehicle fleet
- 100% renewable energy mix from SDCP


City of San Diego Municipal Energy Targets
Annual Energy Consumption (MMBtu)
1,600,000
1,500,000
1,400,000
1,300,000
1,200,000
1,100,000
1,000,000
900,000
1,504,681
1,278,979
1,203,521
15%
25%
1,037,035
1,022,993
959,234
2010
2015
2020
2025
2030
2035
Year

Strategies	Actions	
STRATEGY 1: Reduce Energy Consumption	ACTION 1: Identify and implement energy efficiency projects	✓
	ACTION 2: Measure and manage energy performance	✓
STRATEGY 2: Increase Onsite Renewable Energy Generation	ACTION 1: Implement renewable energy projects	✓
	ACTION 2: Assess the impacts of a changing market	✓
STRATEGY 3: Strive for Zero Emissions Buildings	ACTION 1: Adopt and enforce zero emissions standards and policies	✓
	ACTION 2: Reduce embodied carbon	✓
STRATEGY4: Support Resiliency and Grid Stability	ACTION 1: Deploy smart, connected distributed energy resources	✓
	ACTION 2: Secure funding for grid-interactive efficient building pilot projects	✓
STRATEGY 5: Engage and Educate	ACTION 1: Engage and educate building occupants and patrons	✓
	ACTION 2: Train the local workforce	✓

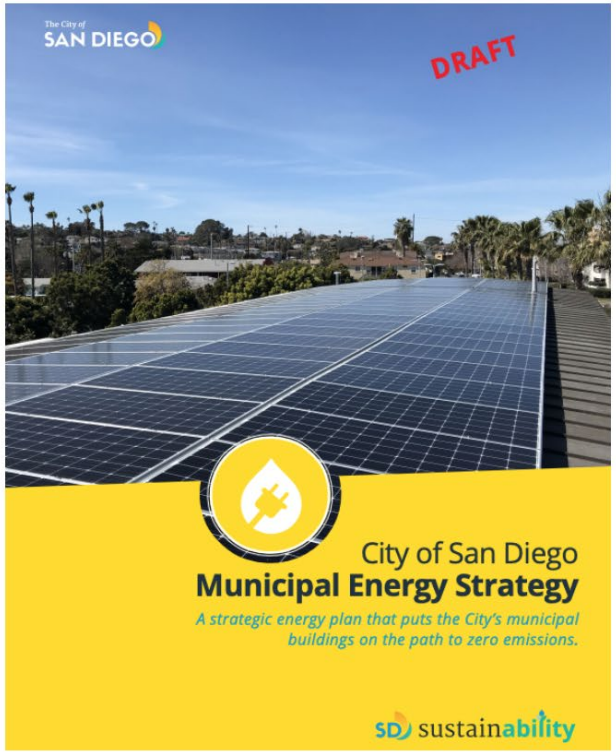




- Many projects already completed and/or underway
  - Reductions being tracked, quantified
- Staff currently performing analysis to assess progress from baseline in 2020
  - Did we hit the 15% reduction milestone?
- **2 new proposed initiatives being presented today**

Municipal Energy Strategy

The City of San Diego's landmark Climate Action Plan, adopted in 2015, includes a goal of creating a more sustainable San Diego by eliminating half of all greenhouse gas emissions (GHGs) in the City by 2035. To meet this goal, action must be taken to reduce municipal building emissions, alongside our residents and businesses. The City of San Diego's municipal building portfolio presents significant opportunities to reduce carbon pollution and minimize the City's contribution to the climate crisis.



The Municipal Energy Strategy demonstrates the commitment of the City of San Diego to lead locally, nationally and globally by advancing projects and policies for City buildings that help mitigate the causes of climate change.

Strategies and Actions

Municipal building improvements will reduce energy use and GHG emissions while improving infrastructure, security, workplace environments, indoor air quality and more.

Strategies and actions in this document include:

Energy and Water Efficiency

Stay Tuned!

The Municipal Energy Strategy will be presented to the San Diego City Council in **Fall 2020**.

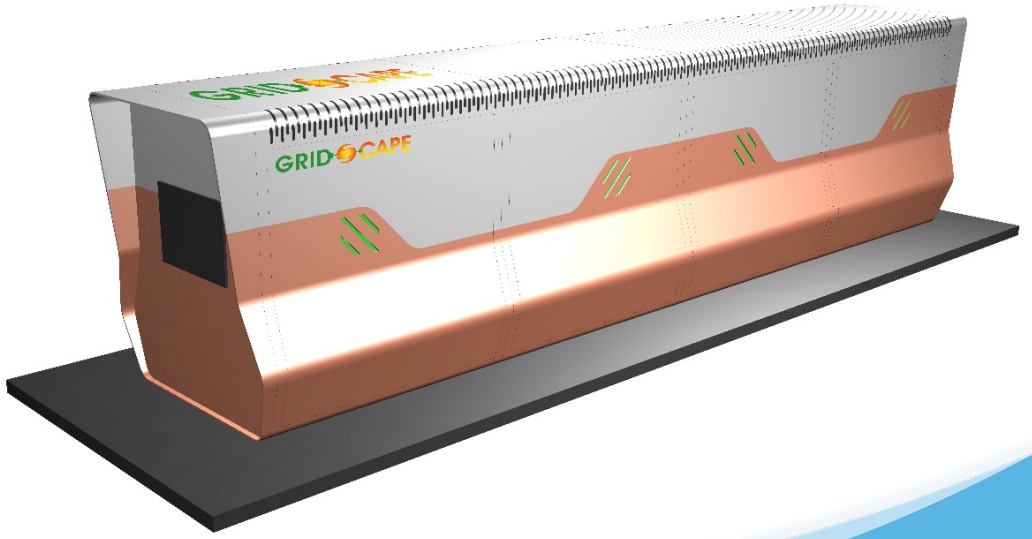
SHARE YOUR FEEDBACK

Feedback

STRATEGY 4:
Support Resiliency and Grid Stability

ACTION 1: Deploy smart, connected distributed energy resources

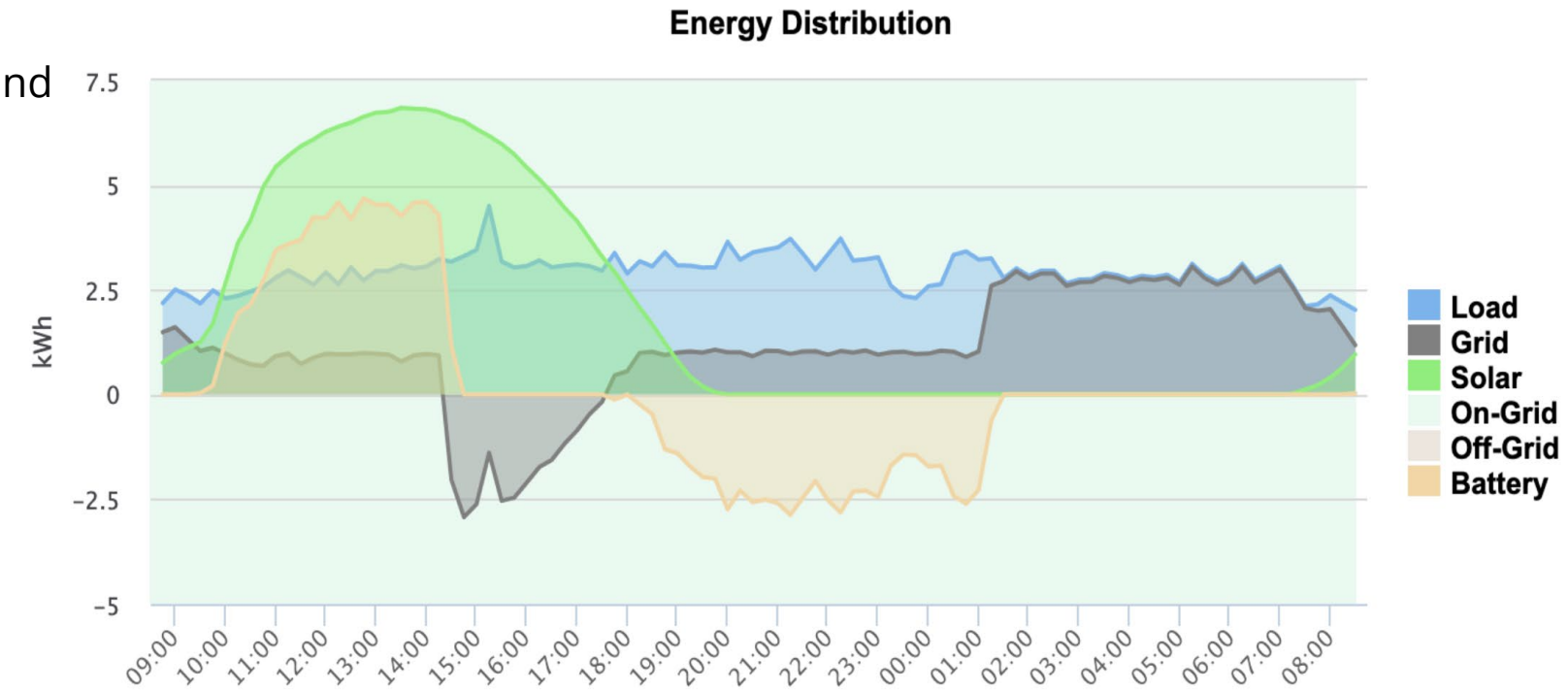
ACTION 2: Secure funding for grid-interactive efficient building pilot projects

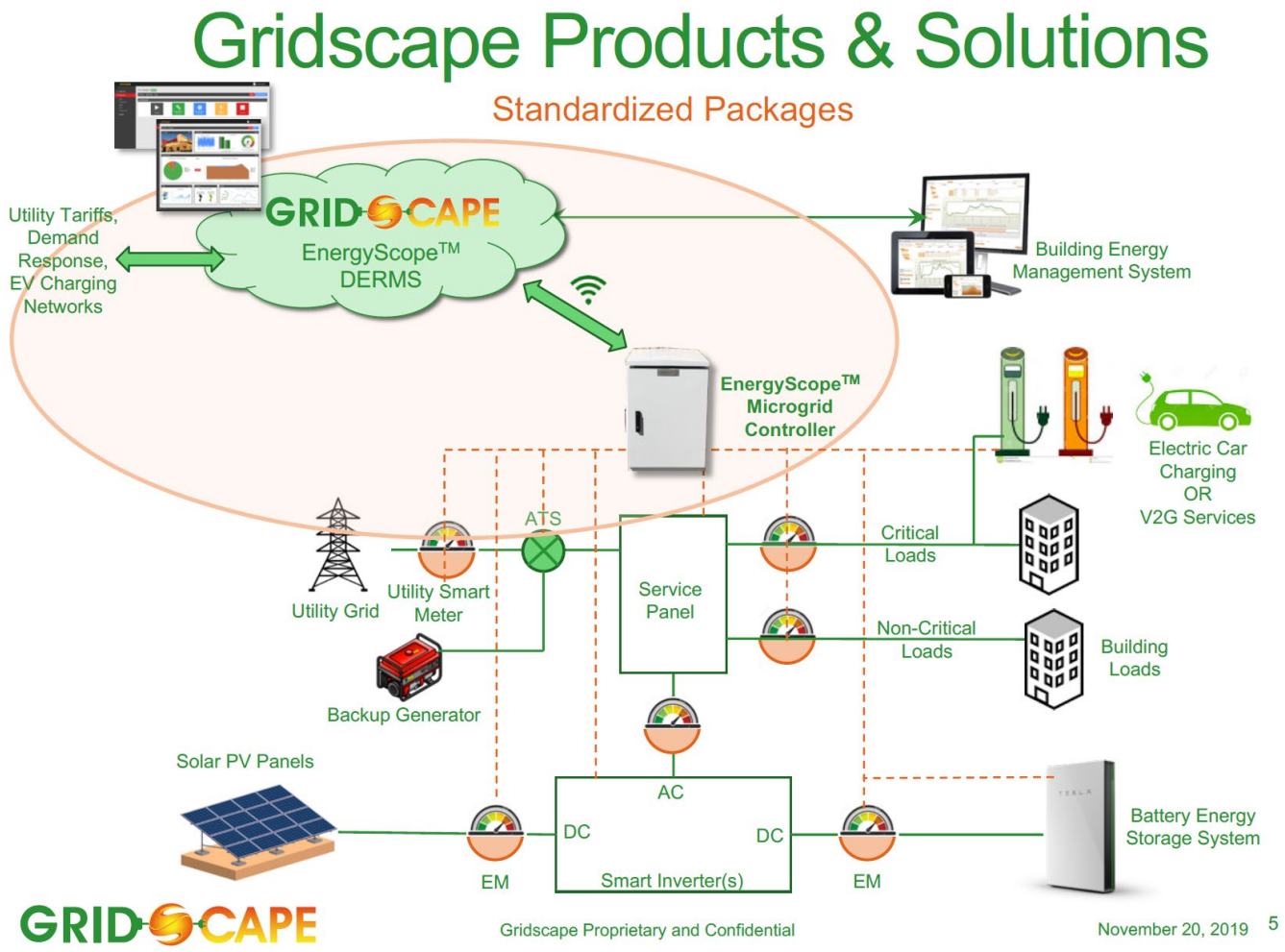


Renewable Microgrids for City Facilities

sustainability

- ***Microgrids*** are standalone power grids that allow a facility or set of connected facilities to “island” or isolate from the grid and continue to operate during grid outages, relying on power stored onsite.
- ***Renewable microgrids*** rely solely on renewable energy generated and stored onsite to remain energized during outages.
- Microgrids increase ***resilience***, meaning the ability to prepare for and adapt to changing conditions, and withstand and recover rapidly from disruptions.
- When the grid is functioning, renewable microgrids provide significant energy, GHG, and cost reductions
- ***Smart*** **microgrids** enable dynamic shifting of a facility’s energy load, allowing electricity consumption and demand to be optimized in response to grid signals and energy pricing

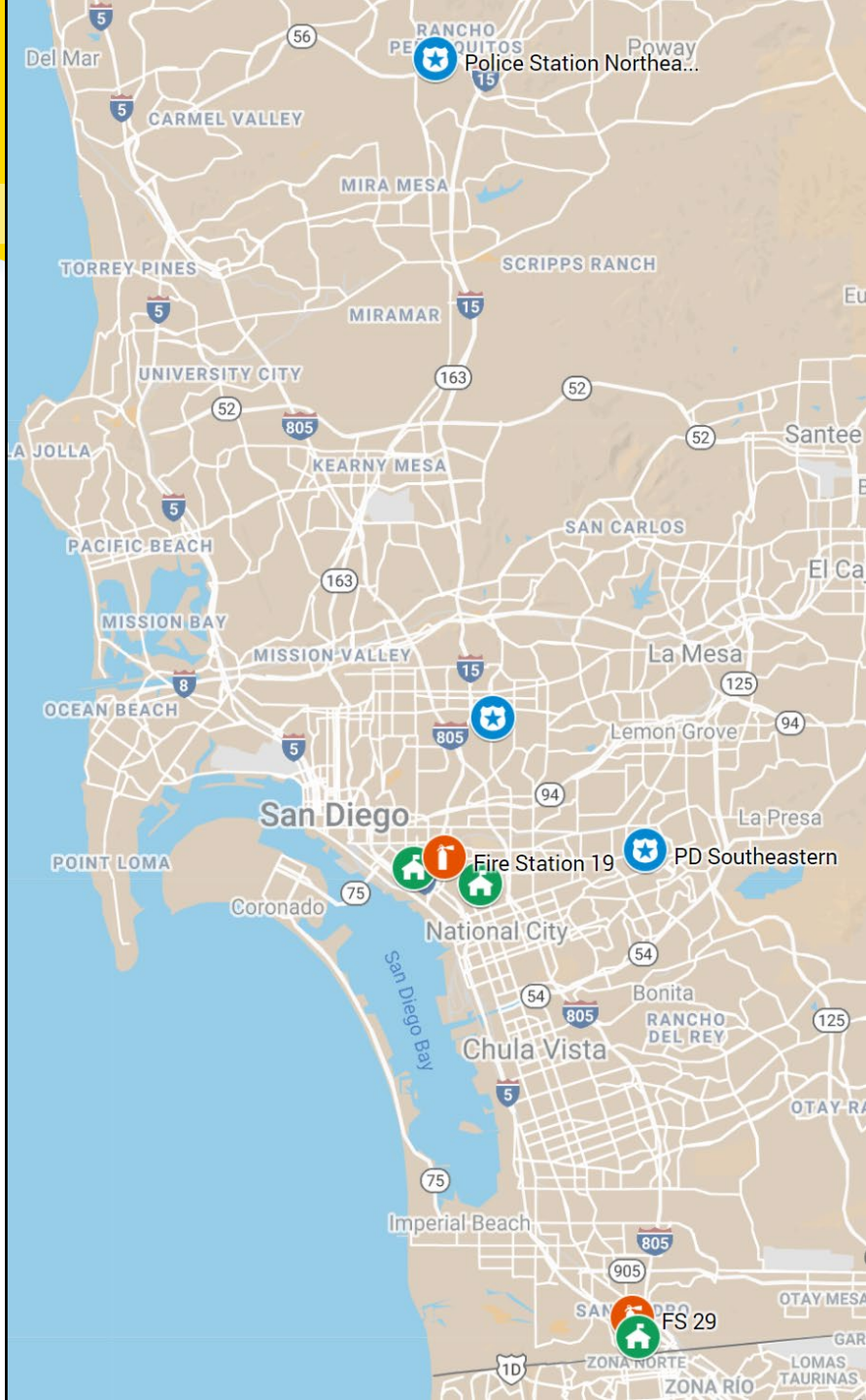




- In November 2019, the City of San Diego was invited by Gridscape Solutions, Inc. to participate in an Advanced Emergency Microgrids grant awarded by the California Energy Commission (CEC) designed to
  - Optimize energy performance via deployment of smart, connected, distributed energy systems at critical facilities in DACs

- Shell New Energies: financier and system owner
- Gridscape Solutions: project developer and O&M provider, CEC grant recipient
- Green Realities: installer/contractor
- City of San Diego: system host and end beneficiary
- California Energy Commission: providing partial funding for sites in disadvantaged communities

	Delores Magdaleno Memorial Recreation Center	Cesar Chavez Recreation Center/ Larsen Field	Southcrest Recreation Center	Fire Station 19	Fire Station 29	Police Station Mid-City	Police Station South-eastern	Police Station North-eastern
Disadvantaged Community (per CEC)	Yes	Yes	Yes	Yes	No	No	No	No
SD Equity Index Score	Very Low Access	Low Access	Low Access	Low Access	Low Access	Low Access	Moderate Access	Very High Access
Council District	8	8	9	9	8	9	4	5
PV + BESS + MG	✓	✓	✓	✓	✓	✓	✓	✓
EV Charging				✓	✓		✓	✓
Site Improvements	New roof, panel upgrade	Solar carport	Panel upgrade	Outdoor lighting, solar carport	Solar carport	Solar carport	Solar carport	Solar carport

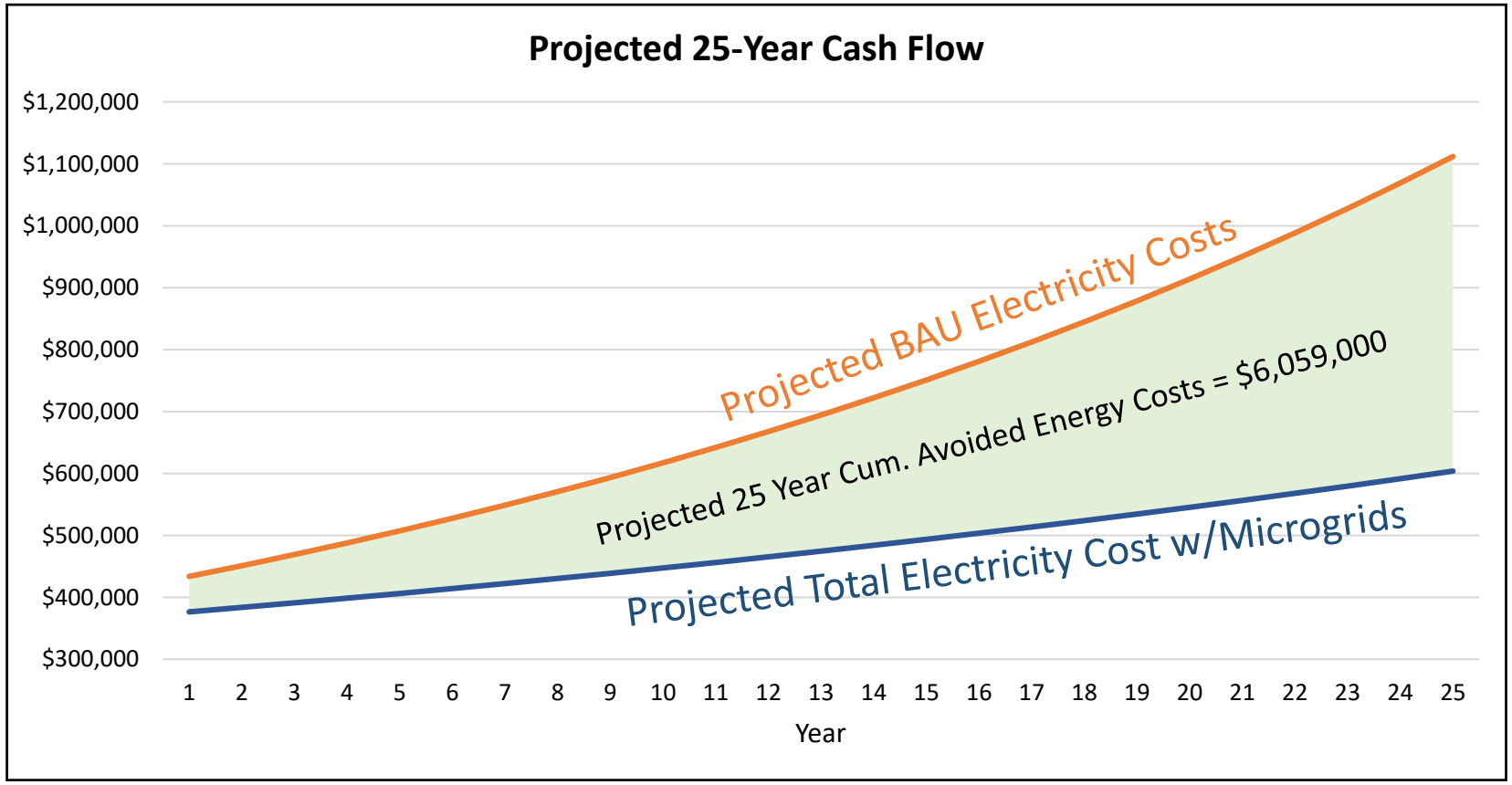


- Contract includes performance guarantees to ensure the project will result in annual net savings to the City after accounting for all energy purchases
  - Guaranteed minimum electricity generation from solar PV
  - Guaranteed minimum electric demand reduction from battery energy storage systems

- Contract includes provisions for annual Measurement and Verification (M&V) to assess system performance and ensure the City is compensated in case the systems do not perform

- Several sites are receiving significant improvements to facilitate the microgrid installations (e.g. new roof)

- No upfront costs to City



Clean Energy Retrofits via Energy Savings Performance Contracting

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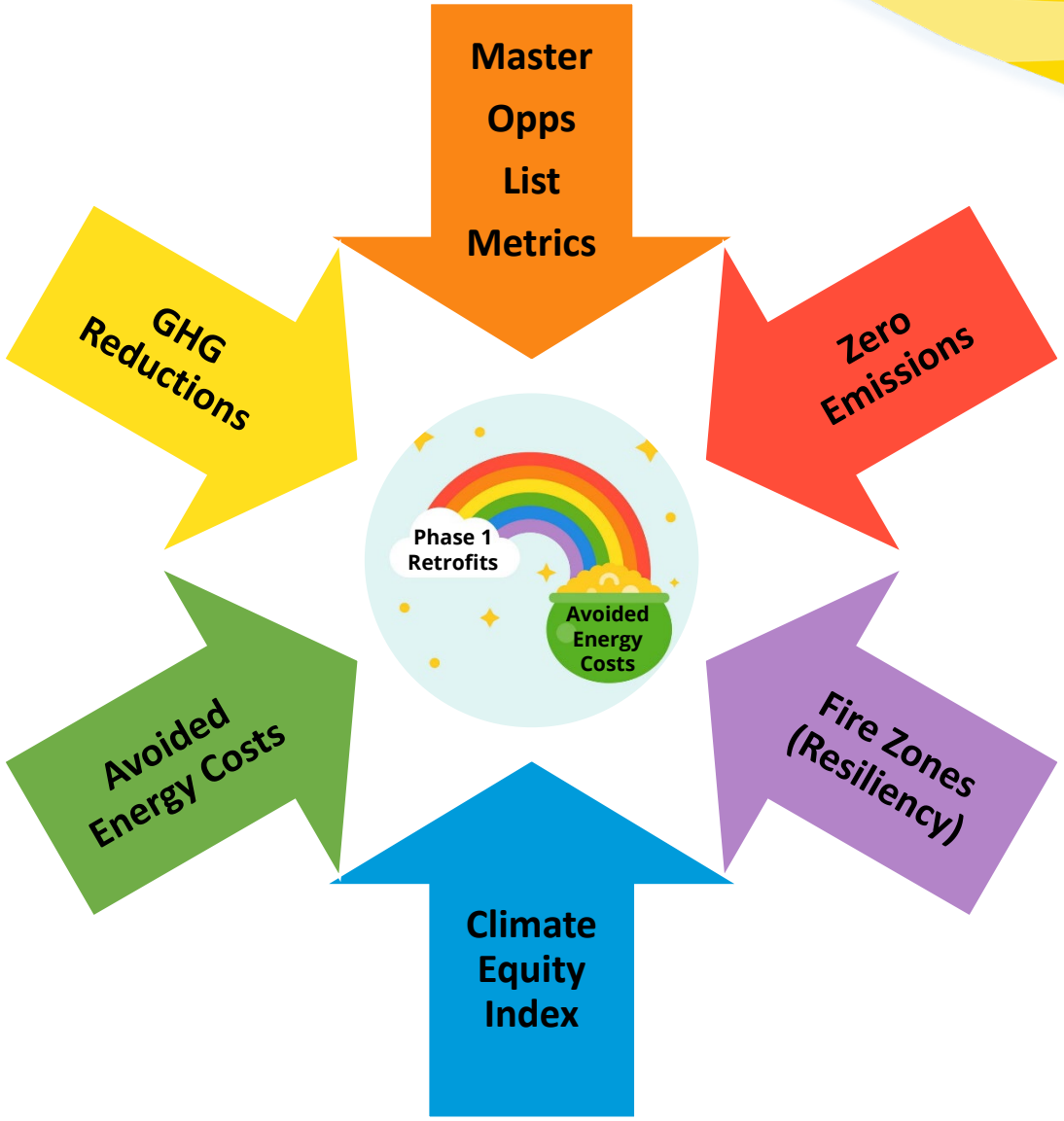
- Goal: portfolio of Clean Energy Retrofits – Phase 1
- As-need energy engineering consulting services

  5-year contract
  - Performed 40+ Level 1 ASHRAE audits
  - Interviewed asset managers and owners
  - Reviewed audit reports from last 5 years
  - Reviewed deferred maintenance logs, CIP requests, EUI, FCI, etc.
- Identified 880 energy measures across 220 facilities
- $27M investment required to achieve 12% annual savings, with a combined 6.5 year payback

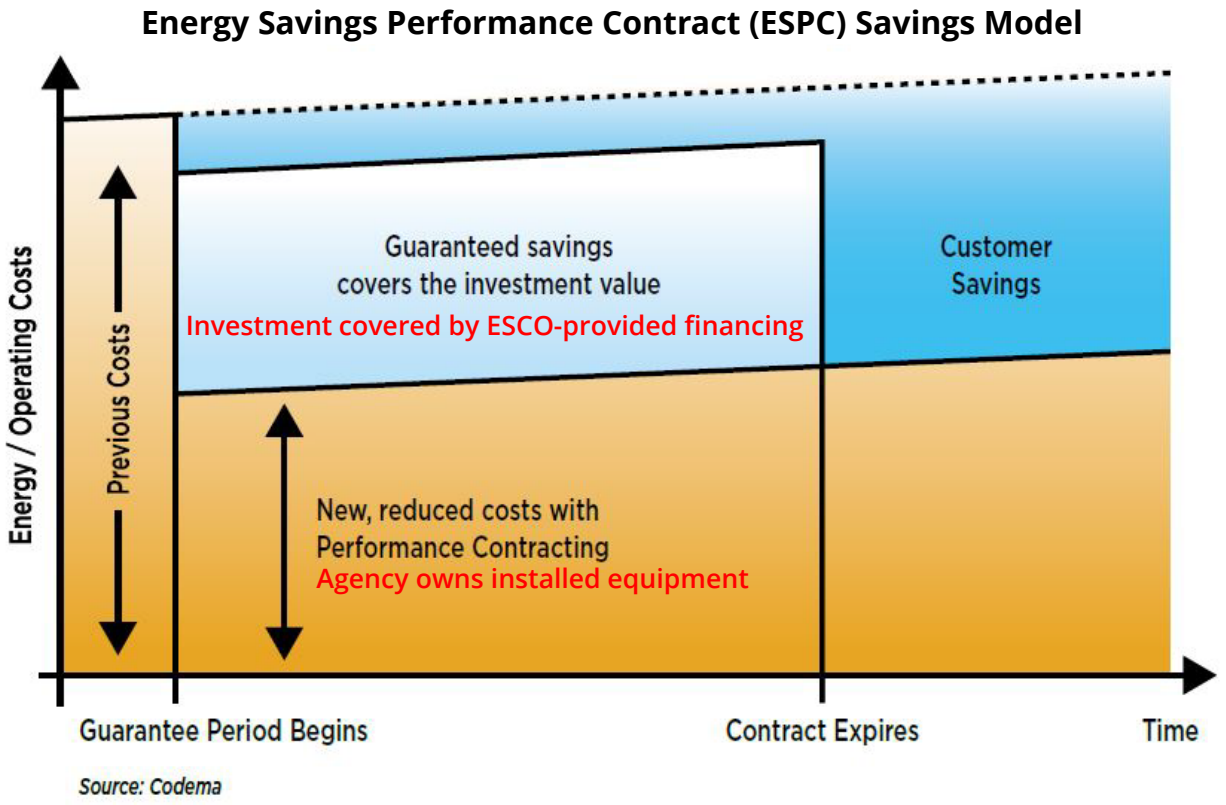

Master Opps List Metrics
GHG Reductions
Zero Emissions
Phase 1 Retrofits
Avoided Energy Costs
Avoided Energy Costs
Fire Zones (Resiliency)
Climate Equity Index

Proposed Phase 1 Clean Energy Retrofit Portfolio

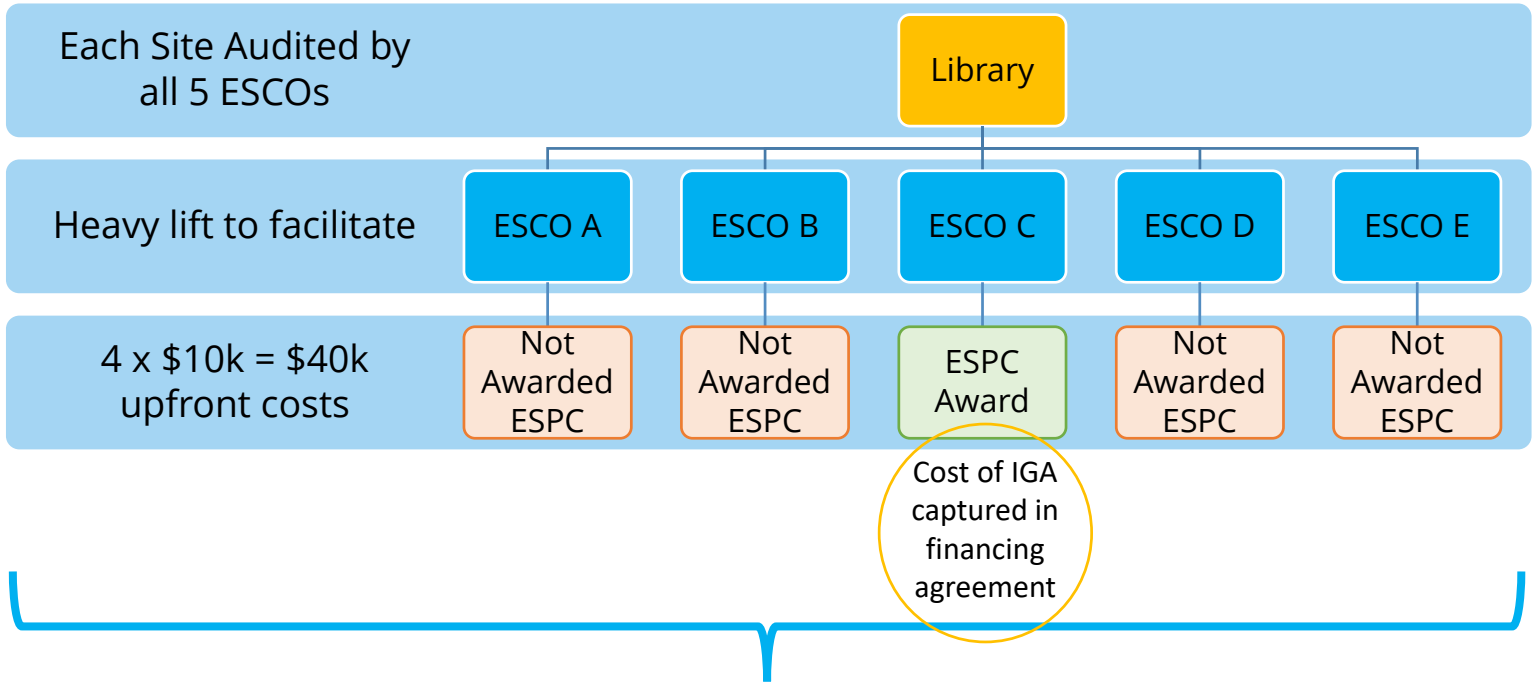
Department	# of Facilities	Avg # of Measures/ Site	Average Payback (yrs)	Est. Energy Reductions (kBtu/yr)
Library	10	4	6	14,059,000
Fire-Rescue	11	5	4	5,477,000
Parks & Recreation	13	4	6	4,369,000
Environmental Services	2	4	8	2,154,000
Police	8	3	6	3,444,000
Transportation & Storm Water	1	8	4	4,598,000
READ	2	4	6	2,092,000
TOTAL	**47**	**5**	**6**	**36,200,000**

Energy Savings Performance Contracts (ESPCs)

- ESPCs are developed in partnership by the Energy Service Company (ESCO) and the agency
- Well tested approach used by federal gov and many local governments

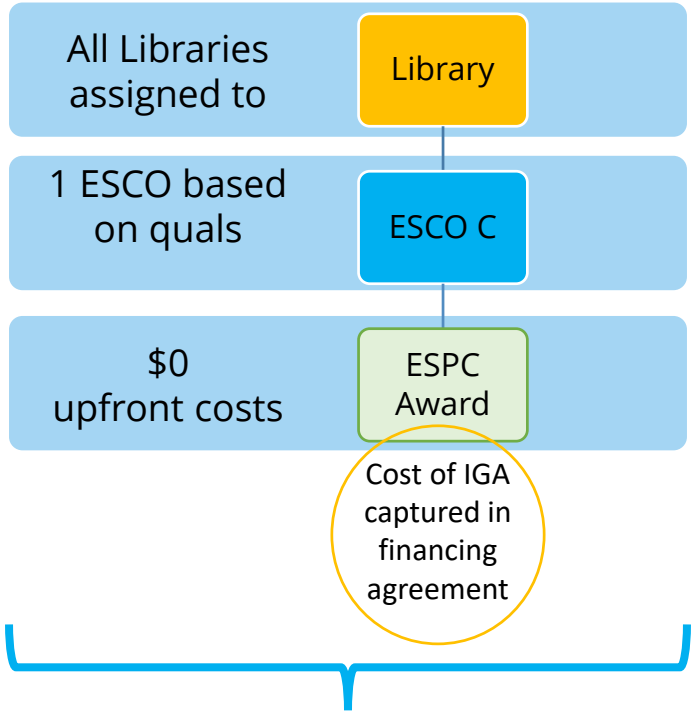


Design–Bid–Build Approach



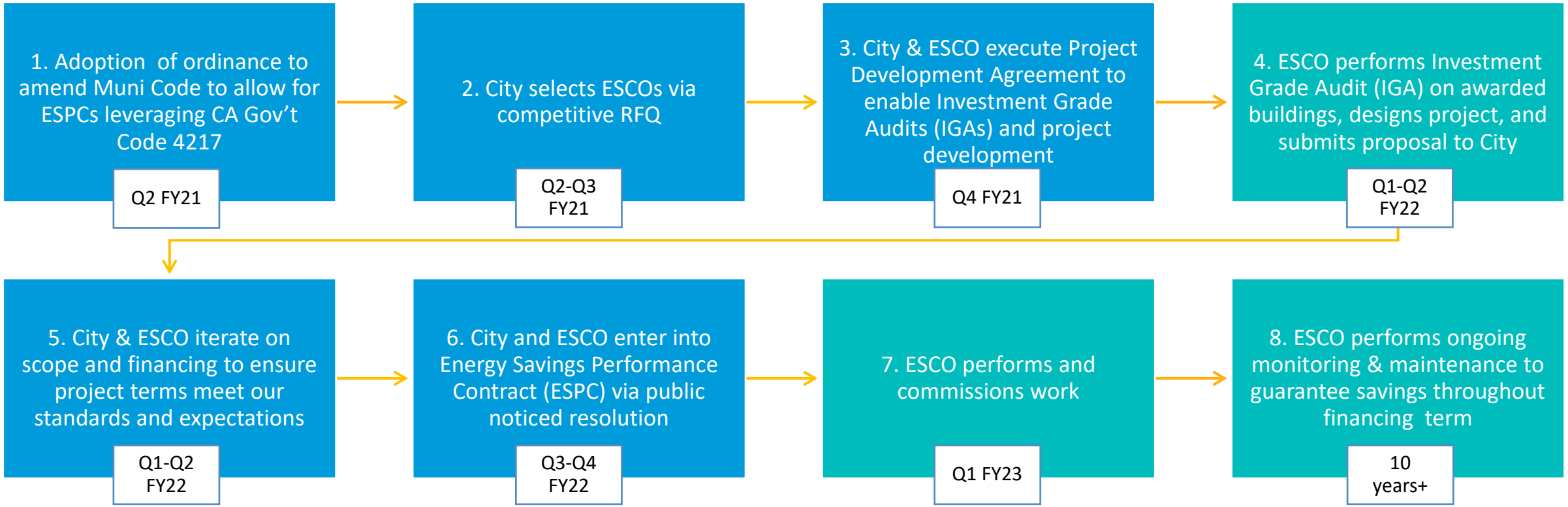
Multiply process and costs **X** 50 sites = 250 IGAs & **$2M** upfront IGA costs

Partnership Approach



One IGA per site & **$0** upfront IGA costs

- CA Government Code 4217
- Permits a public agency to procure an energy services contract instead of typical DBB approach provided that
  - The project is in the best interest of the public agency
  - Project costs are offset by energy savings
- 4217 conflicts with San Diego Muni Code provisions aimed at getting the best or lowest deal (aka DBB)
- Will enable the public-private partnerships with ESCOs necessary to execute energy projects at scale


1. Adoption of ordinance to amend Muni Code to allow for ESPCs leveraging CA Gov't Code 4217
Q2 FY21
2. City selects ESCOs via competitive RFQ
Q2-Q3 FY21
3. City & ESCO execute Project Development Agreement to enable Investment Grade Audits (IGAs) and project development
Q4 FY21
4. ESCO performs Investment Grade Audit (IGA) on awarded buildings, designs project, and submits proposal to City
Q1-Q2 FY22
5. City & ESCO iterate on scope and financing to ensure project terms meet our standards and expectations
Q1-Q2 FY22
6. City and ESCO enter into Energy Savings Performance Contract (ESPC) via public noticed resolution
Q3-Q4 FY22
7. ESCO performs and commissions work
Q1 FY23
8. ESCO performs ongoing monitoring & maintenance to guarantee savings throughout financing term
10 years+

The City of SAN DIEGO

City of San Diego
Municipal Energy Strategy

A strategic energy plan that puts the City's municipal buildings on the path to zero emissions.

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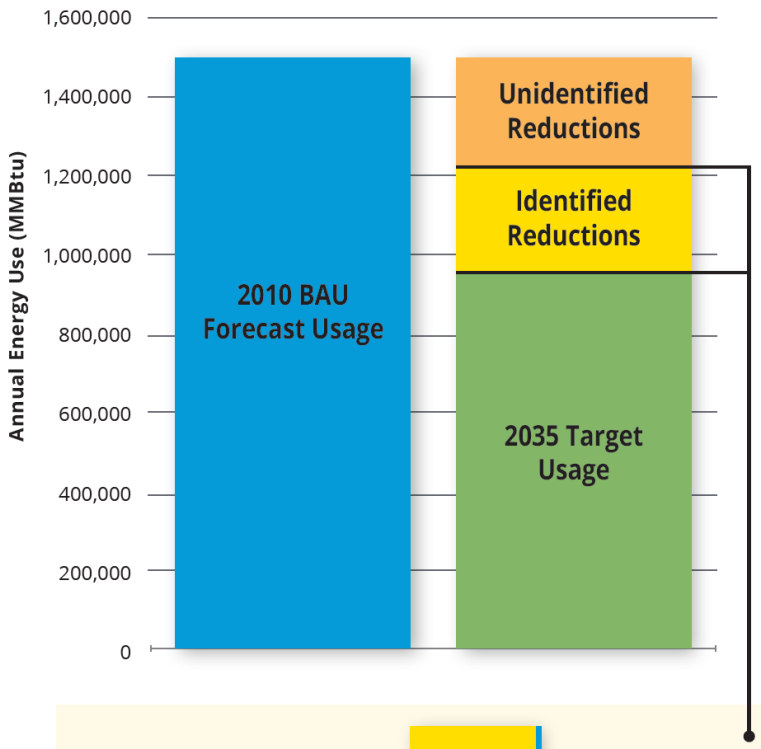
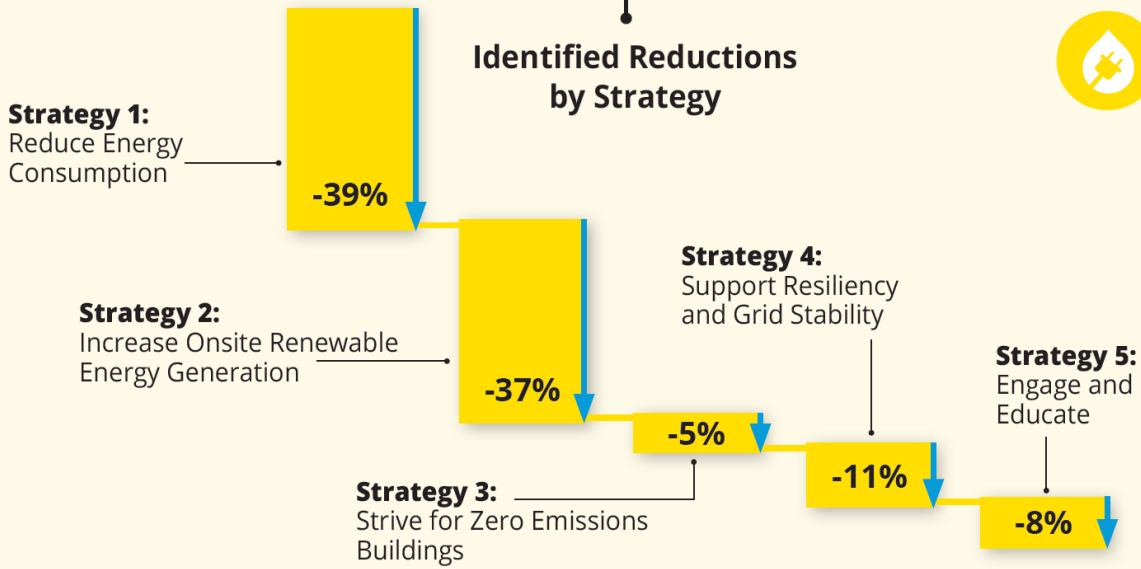
Municipal Energy Strategy Targets & Impacts



By reducing energy consumption, increasing onsite renewable energy generation, electrifying end uses, deploying smart and connected distributed energy resources, and engaging all San Diegans along the way, we increase community resiliency and cut energy costs with minimal impact on the General Fund. With every improvement to our facilities, San Diego will continue to lead in the fight against climate change and pave the path to a cleaner energy future.

Identified Reductions by Strategy



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