



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

Our vision is to be a sustainable and resilient city with opportunity in every community.

City of San Diego Sustainability Department Vision Statement

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Introduction

In 2015, the City of San Diego adopted a landmark Climate Action Plan with the 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, the City must take action to reduce its own 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.

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: optimizing energy use through the deployment of smart, efficient and clean energy technologies; policies to ensure new municipal construction and major renovation projects lead by example; education and engagement of City staff and community members; and decarbonizing the City's municipal building portfolio and fleet. Implementation of these strategies will increase the City's resiliency in the face of climate-driven disruptions, advance climate equity through environmental stewardship and push the City's building portfolio toward the goal of zero emissions by 2035.



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
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
STRATEGY 5: Engage and Educate	ACTION 1: Engage and educate building occupants and patrons ACTION 2: Train the local workforce

Under the City of San Diego's Climate Action Plan (CAP), targets have been established to reduce electricity and natural gas consumption, collectively referred to in this document as "energy," at municipal facilities by 15% by 2020 and an additional 25% by 2035 from a 2010 business-as-usual (BAU) baseline. This document establishes a framework for achieving those goals, focusing on five strategies, and lays out a series of actionable steps to guide City staff and stakeholders.

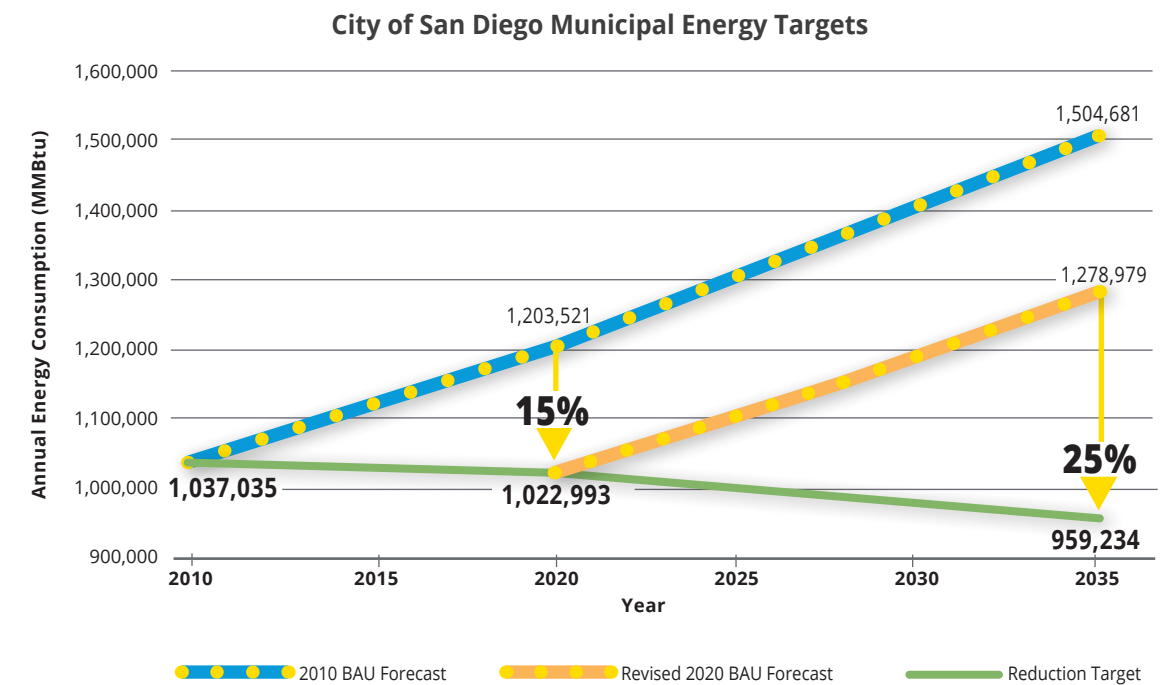


Figure 1. City of San Diego Municipal Energy Reduction Targets. The blue line represents a 1.5% assumed increase in annual energy consumption, starting with the 2010 baseline year. The first CAP target is a 15% reduction in 2020, resulting in a revised BAU projection through 2035 – the orange line, also representing a 1.5% increase year over year. The second cap target is a 25% reduction in 2035, establishing the green trend line for desired consumption levels over the 25-year timeline.

In California, building GHG emissions are second only to transportation when accounting for electricity use, water use and wastewater treatment. The focus over the past decade has been on advancing zero-net-energy buildings, but this must now pivot to **zero-emission buildings** as the state mobilizes to meet its 2030 and 2050 climate goals. This change from zero-net energy to zero-emission buildings focuses squarely on reducing GHG emissions from the entire building, including from the use of electricity, natural gas, other fuels, as well as cooling systems that typically use highly potent GHGs.¹

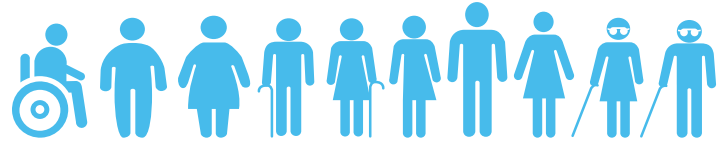


¹ California Energy Commission staff. 2018. 2018 Integrated Energy Policy Report Update, Volume II. California Energy Commission. Publication Number: 100-2018-001-V2-CME.



The strategies include a focus on decreasing energy use while increasing resiliency in the face of energy disruptions, such as wildfires, floods and severe weather events which could threaten city infrastructure. The framework is also rooted in the goal of climate equity so that the benefits of these improvements increase access to opportunity for our residents where it is needed most.

Climate equity: addressing historical inequities suffered by people of color, allowing everyone to fairly share the same benefits and burdens from climate solutions and attain full and equal access to opportunities regardless of one's background and identity.



As stated in the CAP, the Municipal Energy Strategy will be followed by an Implementation Plan that will provide more detail on current energy performance of City facilities, along with planned energy projects and their associated costs, savings, and GHG reductions estimates. While the Municipal Energy Strategy serves as the map of potential paths to a 100% renewable future for City facilities, the Implementation Plan will identify specific projects, policies, and programs to be pursued by City staff and stakeholders. Both documents will be updated periodically to reflect changing variables in the rapidly-evolving clean energy landscape.

SAN DIEGO COMMUNITY POWER

The City of San Diego is moving forward with Community Choice Aggregation to achieve 100% renewable energy citywide by 2035. This path allows the City to partner with nearby local agencies to form a regional entity - San Diego Community Power - that can purchase clean energy on the open market at more competitive rates for customers. While this step takes the region significantly closer to the goals established in the CAP, the City will still be required to pay for energy it consumes, no matter the source and provider of that energy. Implementation of the Municipal Energy Strategy will provide added benefits above and beyond formation of the CCA through reductions in energy consumption and energy costs, increased operational efficiency, and increased resiliency in the face of climate-driven energy disruptions.



The City of San Diego's Existing Energy Management Efforts

The City of San Diego owns and maintains a diverse set of buildings and infrastructure including libraries, museums, recreation centers, parks, pools, offices, police stations, fire and lifeguard stations, pump stations, water and wastewater treatment plants, traffic signals and streetlights. The City purchases energy to heat, cool and power approximately **7.6 million square feet of floor area**. Most existing municipal buildings are expected to last well beyond 2035. With plenty of high-yield energy savings opportunities, these buildings will play an important role in San Diego's progress toward meeting its climate action goals.

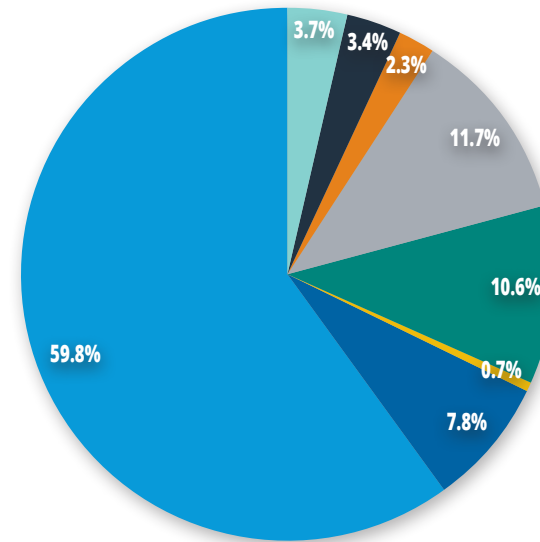
In 2018, the City spent approximately **\$50 million on energy to heat and power buildings, street lights and public utility facilities**, resulting in approximately **72,500 metric tons of carbon-dioxide equivalent** (CO₂e is a measurement of carbon dioxide, methane and nitrous oxide the primary gases contributing to global climate change.) Energy consumed by City facilities comprises about 2% of total energy consumed in the City of San Diego, and 2% of the citywide GHG emissions associated with building energy use.

The City's facility portfolio varies greatly in purpose and energy use. For example, recreation centers and wastewater pump stations function very differently, and each City department has a unique approach to facility operations and design.

While the Public Utilities Department (PUD) is the largest energy user of all City departments when accounting for water supply and treatment operations, PUD has a dynamic renewable energy and efficiency program that **generates more clean energy than any other SDG&E customer**. Still, additional energy and cost-saving opportunities exist both in the buildings PUD occupies and the complex water supply and treatment processes carried out each day.



Energy Use by Department (2016)



Floor Area by Department (2016)

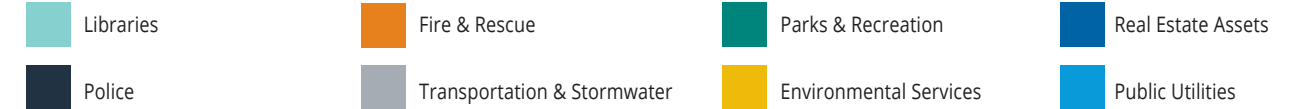
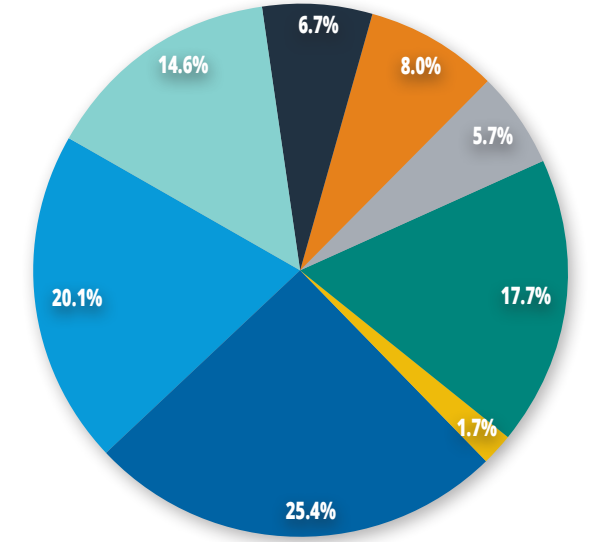


Figure 2. Floor Area and Energy Use by Department

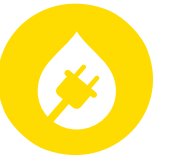
Across the City's building portfolio, the physical condition and energy performance of City assets present significant GHG reduction opportunities that the City has only begun to leverage. To increase energy savings in all City building types, the Sustainability Department partners with Asset Managing Departments (AMDs) and the Real Estate Assets Department's Facilities Division. These existing relationships will be critical to completing strategic investments in large facilities which can meet infrastructure needs and address deferred maintenance while also saving energy and reducing the City's carbon footprint.

The City uses a centralized approach to purchasing energy and managing energy bills. While this system is efficient for payment processing, it reduces the need for facility personnel to review utility bills, and to understand and manage energy use. The Municipal Energy Strategy includes actions to better educate and incentivize City employees to better manage energy in buildings they occupy.

The existing municipal building stock is expected to last long into the future and new construction will be limited. To achieve the municipal GHG reductions stated in the CAP, the City must leverage the existing building portfolio. The City commits to exploring all possible improvements both operational and physical while deploying clean energy projects.

For example, by addressing deferred maintenance, the City can take advantage of the opportunity to increase occupant comfort and productivity, in addition to reducing operating costs. The implementation of a building energy management and automation system can be leveraged to develop a broader citywide data platform that informs space management, security, mobility, and more. This work can be completed with funding and financing strategies already well-established in the market that have little to no impact on the General Fund.

Strategy 1: Reduce Energy Consumption



Reducing energy consumed by City facilities through energy efficiency measures and conservation reduces GHG emissions, saves money, and presents opportunities to increase operational efficiency and address deferred maintenance.

Action 1: IDENTIFY AND IMPLEMENT ENERGY EFFICIENCY PROJECTS

- Perform energy audits at City facilities to identify energy efficiency opportunities. Benchmark energy performance and prioritize audits at buildings with high energy use intensities (EUI) buildings that use more energy per square foot than other buildings of the same type and buildings with high energy costs.
- Coordinate with departments that regularly identify and address building needs including Real Estate Assets and Public Works. Specifically, review documentation regarding facility conditions, deferred maintenance and planned capital improvements, and explore ways to incorporate efficiency measures into planned work and vice versa. Engage building occupants to gather experiential feedback on comfort levels and operational issues that may be addressed alongside energy efficiency upgrades.
- Partner with the Public Utilities Department to implement water and wastewater treatment facility and pumping system upgrades that increase system performance while also decreasing energy consumption and GHG emissions.
- Prioritize energy efficiency measures and projects based on multiple factors including GHG reductions, life cycle costs and savings, maintenance savings, payback, etc. Ensure that priority is given to municipal facilities that support Communities of Concern and projects that increase the City's resiliency in the face of energy disruptions and natural disasters.
- Pursue comprehensive energy retrofit projects that address the building as a system, including the building envelope, heating and cooling systems and controls, lighting systems and controls, and other energy efficiency measures as identified. Consider opportunities to incorporate renewable energy, battery energy storage, and other alternative clean energy solutions into one project scope to maximize GHG reductions and minimize repeat disruptions to building operations.
- Explore and pursue a diversified portfolio of funding and financing options that enable deep energy retrofits while avoiding significant upfront capital costs.
- Continue to increase the efficiency of the City's streetlights through retrofits with LED fixtures or other technologies as they become available. Reduce energy consumed by City streetlights through implementing dimming policies that take advantage of ambient light during dawn and dusk. Maximize the use of technologies that allow for remote monitoring and management of streetlight performance.
- Document lessons learned as projects are implemented; gather feedback from all parties involved in and impacted by the projects. Incorporate lessons learned from pilot projects currently underway. Use lessons learned to repeat successful processes and improve project delivery over time.

Communities of Concern

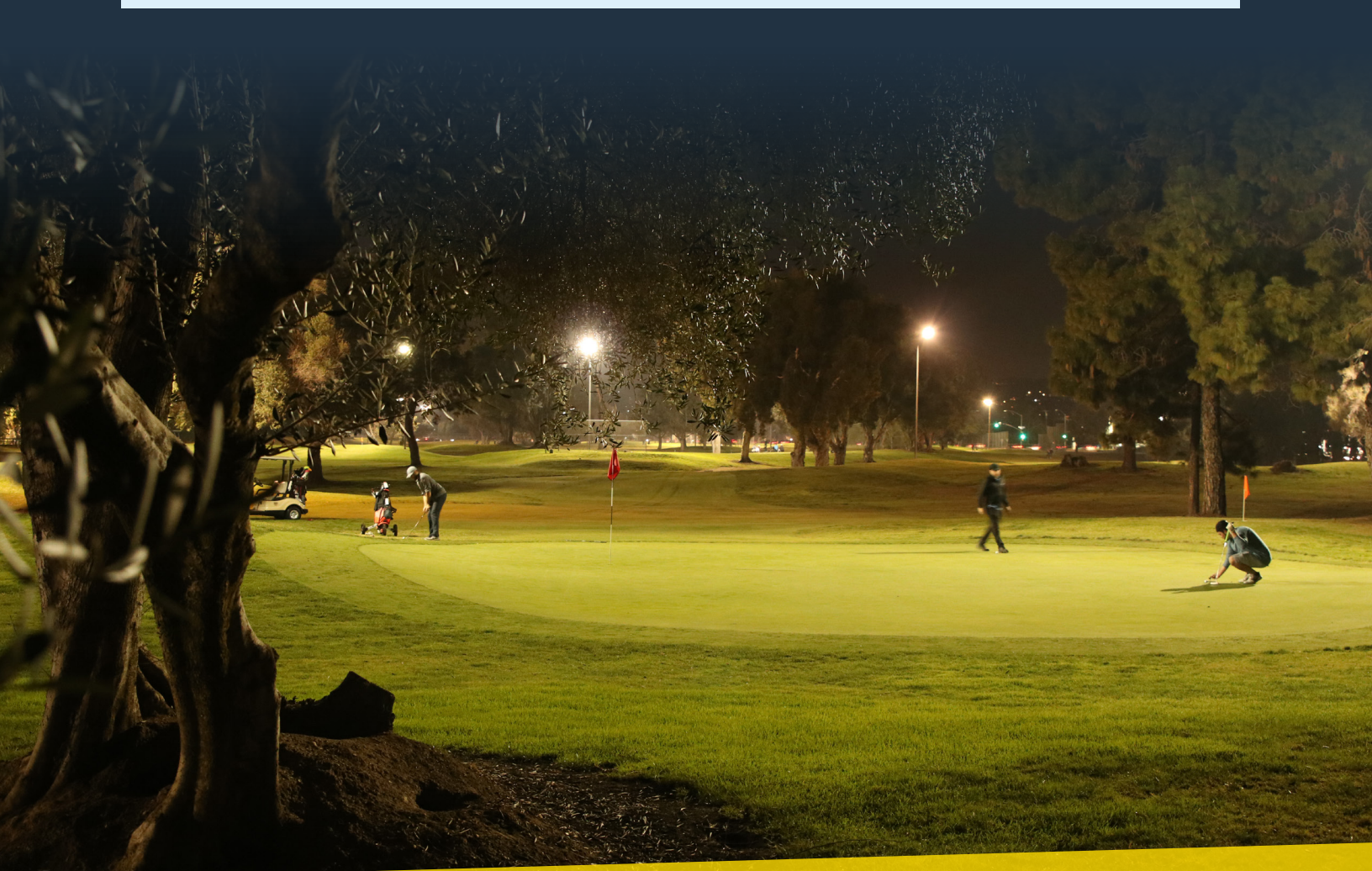
are census tracts identified within the City's [Climate Equity Index \(CEI\)](#) as having very low to low access to opportunity based on 35 indicators in five categories (environmental, socioeconomic, housing, mobility and health). As a result of lower access to opportunity, these communities are also more vulnerable to the impacts of climate change and must be prioritized.

The 2015 CAP establishes the following municipal CO2e reductions:

Year	Overall Energy Reductions ⁴³	Electricity Reductions	Natural Gas Reductions	GHG Reductions
		(GWh)	(MM Therms)	(MT CO ₂ e)
2020	15%	36	0.6	11,580
2035	25%	75	1.2	9,011

The targets established in this document vary slightly from the original targets in two ways:

- 1. The original reductions represent a 25% reduction from the 2010 BAU projection at 2035.** The new targets reflect cumulative reductions at 2020 and 2035, resulting in a 36% reduction from the 2010 BAU projection at 2035.
- 2. Instead of measuring reductions in CO₂e, the new targets are translated to Million BTUs, a measure of energy common to electricity and natural gas, the two primary fuels consumed by building operations.** This new metric will result in a more straightforward effort to measure and verify reductions that result from implementation of the strategies below. Each year, reductions will be translated to CO₂ equivalents based on that year's electricity mix or renewable energy content.



Action 2: MEASURE AND MANAGE ENERGY PERFORMANCE

- Identify and implement a building automation system (BAS) that facilitates ongoing measurement and verification of energy performance and streamlined energy management of all City facilities.
- Perform a citywide BAS inventory that identifies current energy management systems in place at City facilities and documents the extent of system upgrades necessary to proliferate a citywide BAS. Test and demonstrate the feasibility of BAS functionality in older City facilities that have antiquated energy systems.
- Regularly employ continuous building retro-commissioning (RCx), essentially a tune-up of building control systems, and install fault detection software to identify poor equipment performance, ensure buildings operate as designed and maintain peak efficiency.
- Partner with the Department of Information Technology (DoIT) to explore ways the City can leverage a citywide BAS to implement a broader Internet of things (IoT) platform.

Project examples

SCOUP

Smart City Open Urban Platform (SCOUP) is a pilot project funded by a \$1.9 million grant from the California Energy Commission. SCOUP involves the installation of building energy management systems, controls and dashboards that track real-time energy performance at five City facilities and provide feedback on building energy usage. Energy dashboards will be installed in the lobbies of the five facilities and the Facilities Division will have back-end access to the energy management systems, allowing for real-time management of building energy performance. The project involves the replacement of antiquated thermostatic HVAC controls with Direct Digital Controls (DDC) at the Civic Center Complex facility.

Zero Net Energy Libraries

The Zero Net Energy (ZNE) Library project is funded by a \$3.5 million grant from the California Energy Commission. The project involves deep energy retrofits at three City facilities: Serra Mesa-Kearny Mesa, Valencia Park/Malcom X and Point Loma/Hervey libraries. The buildings are receiving upgraded lighting and lighting controls, new building energy management systems, and dashboards in the lobbies that share energy performance results with library patrons. Point Loma/Hervey is also receiving a new chiller. All three libraries have onsite solar photovoltaic (PV) systems. The goal is for the sites to use only as much energy as is generated by the onsite solar over a year's time, achieving ZNE status, and to serve as successful examples of ZNE retrofits on existing buildings.

Opportunity

ESPCs

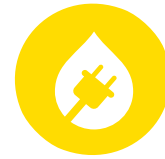
The City of San Diego is ideally positioned to enter into energy savings performance contracts (ESPCs) with energy service companies (ESCOs). In these contracts, ESCOs act as project developers and arrange financing for projects designed to improve the energy efficiency and maintenance costs for large buildings. Through performance contracting, an ESCO assesses a facility's energy efficiency opportunities, manages the construction, monitors and maintains energy performance, and recoups project costs through guaranteed energy cost savings over a specified amount of time. ESPCs can be particularly effective for large-scale collections of efficiency and/or renewable energy projects conducted at the same time.



MUNICIPAL FLEET ELECTRIFICATION

The Climate Action Plan calls for electrifying 90% of the City's municipal fleet by 2035. Currently numbering over 4,000 fleet vehicles, municipal fleet electrification will significantly impact the City's energy demand. Fleet vehicle charging will primarily be conducted at charging stations installed at the facilities where fleet vehicles park for long periods of time. This strategy accounts for the anticipated energy demand increase municipal-wide and facility-level caused by municipal fleet electrification.

Strategy 2: Increase Onsite Renewable Energy Generation



After maximizing energy efficiency at City facilities, onsite generation of renewable energy to supply remaining energy demand is an effective way to further reduce energy costs and GHG emissions and achieve zero net energy at both existing and newly constructed buildings.

Action 1: IMPLEMENT RENEWABLE ENERGY PROJECTS

- Perform energy bill and onsite capacity assessments of City facilities to identify renewable energy opportunities. Prioritize buildings with high energy costs and minimal space constraints, buildings with fleet electric vehicle charging infrastructure, and projects at municipal facilities that support Communities of Concern.
- Explore all feasible renewable generating technologies including solar PV, solar thermal, wind, fuel cells and other technologies as they arise. Explore siting renewable generation projects on City-owned land, lakes and reservoirs, and leverage power-wheeling authority granted by local utilities and state regulatory authorities.
- Partner with the Public Utilities and Environmental Services departments to continue to implement renewable energy and load-shifting technologies that help reduce GHG emissions associated with water supply and treatment.
- Implement cost-effective renewable generation projects using financing mechanisms like power purchase agreements (PPAs) that eliminate the need for upfront costs.
- Consider the value of combining renewable generation with battery energy storage systems and/or microgrid installations to increase opportunities for cost-cutting activities such as load shifting and peak demand shaving. Battery energy storage and microgrids paired with solar PV also increase resiliency in the face of energy disruptions and support a stable electric grid (referenced in Strategy 4.) Prioritize projects at municipal facilities that support Communities of Concern as they will be disproportionately affected by climate-related disruptions.
- Consider opportunities to implement comprehensive projects that combine renewable energy and other alternative clean energy solutions into one project scope to maximize GHG reductions and minimize repeat disruptions to building operations.
- Identify and pursue incentives and rebates that help offset project costs and/or provide project support in the form of technical assistance. Seek grant funding to support implementation of innovative renewable energy projects.

Action 2: ASSESS THE IMPACTS OF A CHANGING MARKET

- The City has a goal to achieve 100% renewable electricity citywide by 2035. Once the new regional community choice aggregation entity, San Diego Community Power (SDCP), is fully operational and procuring power, assess any new viability for onsite renewable generation at municipal facilities. A focus on local, renewable generation by SDCP may make renewable energy projects at municipal facilities more cost-effective.
- Follow advancement of tariffs that allow for public-private partnerships such as community solar, installations that are sited on municipal property and provide renewable credits to surrounding community residents and businesses. When practical, partner with local nonprofits and community stakeholders to develop community solar projects and programs.

Project examples

Phase 1 Solar PV Power Purchase Agreements (PPAs)

A solar PPA is a long-term contract with a third party to finance, install, operate and maintain a solar array on City property. Power produced by the on-site array is supplied at a price specified in the PPA and used behind the City's utility meter. These agreements allow the City to get solar pricing that takes advantage of federal tax credits for renewable energy. In early 2019, the City of San Diego partnered with a third-party PPA provider to complete the installation of solar PV at 17 City-owned rooftops and carports. The systems help offset energy costs for a variety of facility types and for City departments including Police, Fire-Rescue, Parks and Recreation, and Library. The completed portfolio produces approximately 3.5 megawatts of power annually and will result in an estimated cost savings of \$12.5 million over the 20-year PPA term.

The Solar Energy Innovation Network (SEIN)

Supported by a grant from the Department of Energy, SEIN allowed the City to explore the renewable energy potential for solar systems 1 megawatt or larger within City limits. An interactive map lets residents and City staff explore the solar potential of a property and the generation capacity of nearby electrical substations.

Beneficial Use of Digester Gas

In 2011, the City's Public Utilities Department installed a privatized Beneficial Use of Digester Gas (BUDG) plant at the Point Loma Wastewater Treatment Plant. The BUDG plant cleans the excess digester gas and powers an onsite 0.3 megawatt fuel cell plant. One hundred percent of the electricity generated from the fuel cell plant is used to run the BUDG plant. The plant feeds excess clean gas into the SDG&E natural gas pipeline for wheeling, which is being used to power a 1.4 megawatt privatized fuel cell plant at the South Bay Water Reclamation Plant, and a 2.8 megawatt fuel cell plant at UC San Diego.

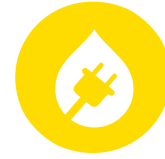
Opportunity

Phase 2 Solar and Solar + Storage PPA RFP

Following the successful installation of 17 rooftop and parking lot solar installations, the City plans to execute PPAs for solar PV and solar paired with battery storage systems at additional municipal buildings. Phase 2 will include facilities from Police, Library, and the Parks and Recreation departments.



Strategy 3: Strive for Zero Emissions Buildings



Zero emissions (also referred to as zero carbon) buildings are designed and equipped so that all energy use in the building — for heating, cooling, lighting, appliances, fleet vehicle charging, etc. — is as efficient as possible and comes from renewable energy sources.² Zero emissions buildings also do not use natural gas, a common building and water heating fuel with significant climate change impacts. As the City transitions to 100% renewable electricity procured by San Diego Community Power, maximizing the shift away from natural gas use and toward electricity for all building end uses is one of the fastest and most effective ways to deliver on this strategy.

As the City operates its buildings, it consumes other resources that contribute to climate change. For example, according to a California Energy Commission 2005 report, water-related energy consumption accounts for nearly one-fifth of the state's total electricity usage. Energy usage for water is important to understand not only because of the implications for the state's total energy demands but, also, because of the implications for GHG emissions and the climate goals of the region.³

Action 1: ADOPT AND ENFORCE ZERO EMISSIONS BUILDING STANDARDS AND POLICIES

- Adopt a zero emissions policy that applies to new municipal construction projects. This policy will establish building standards and performance targets that incorporate energy efficiency, solar PV and electric vehicle charging 'readiness', and specifications for BAS and controls technologies to ensure all newly-installed systems can be integrated into a citywide IoT platform. Ensure existing policies addressing building energy performance are either retired or updated to reflect new standard.⁴
- To ensure compliance with the new policy, continually update all municipal construction guidance documents to reflect new standards, specifications and targets. Partner with the Public Works and Development Services departments to establish appropriate review and approval processes that facilitate enforcement. Provide education to critical internal and external stakeholders addressing zero emissions building solutions.
- Track advancement of regulatory requirements addressing backup diesel generators at critical facilities. When feasible, explore options for phasing them out and replacing them with proven, renewably-powered alternative technologies.

Action 2: REDUCE EMBODIED CARBON

- Consider ways to reduce the embodied carbon GHG emissions associated with extracting, manufacturing and transporting materials to the jobsite of new municipal construction projects.
- Place special emphasis on reducing the embodied energy, or energy intensity of water that results from treatment and delivery. Partner with the Public Utilities Department to continue to implement system improvements, install renewable energy, and perform treatment optimization technologies that meet regulatory and permitting requirements to help reduce GHG.

- Implement water conservation strategies at municipal facilities. Consider updates to Council Policy 400-11⁵, the City's water conservation policy adopted in 1987. Seek opportunities to include water conservation upgrades in comprehensive municipal building energy improvement projects.

Project examples

Los Angeles Carbon Free Building Policy

Adopted in February 2020, Mayor Eric Garcetti's Executive Directive addresses building design and operations in new construction and major renovations of municipal buildings calling for "maximizing deployment of energy efficiency, smart design, on-site renewable generation, and electrification" in order to reach carbon neutrality by 2030. Additionally, the directive aims to significantly reduce the amount of carbon in municipal construction materials such as steel, flat glass, and mineral wool board insulation by adopting the Buy Clean California Act, which will establish Environmental Product Declaration (EPD) requirements to limit Global Warming Potential (GWP) for those materials. With this action, Los Angeles is the first California city to fully adopt the Act guidelines although others such as Berkeley, Cupertino and Richmond have endorsed them. This sends an important market signal that reducing embodied carbon is a priority action for this large building owner. In addition to addressing zero carbon buildings both operational and embodied the mayor's directive calls for carbon reductions in the electricity grid and transportation sector, as well as investigating options for low- and zero-carbon based renewable energy investment. The order also requires equitable access to clean power for low-income, multifamily, and affordable housing. Other provisions cover zero waste, zero-wasted water, resilient and cool cities, and air quality tracking.⁶

Pure Water San Diego

Pure Water San Diego is the City of San Diego's phased, multi-year program that will provide one-third of San Diego's water supply locally by 2035. The Pure Water San Diego Program will use proven water purification technology to clean recycled water to produce safe, high-quality drinking water. The program offers a cost-effective investment for San Diego's water needs and will provide a reliable, sustainable water supply that has a lower energy intensity than the water currently imported to the region.



² Carbon Neutral Cities Alliance. *GAME CHANGERS: Bold Actions by Cities to Accelerate Progress Toward Carbon Neutrality*. March 2020.

³ Raeser, L. *San Diego's Water Sources: Assessing the Options*. July 2010

⁴ https://docs.sandiego.gov/councilpolicies/cpd_900-02.pdf
<https://www.sandiego.gov/sites/default/files/legacy/environmental-services/energy/pdf/900-14.pdf>

⁵ https://docs.sandiego.gov/councilcomm_agendas_attach/2011/NRC_110302_4b.pdf

⁶ <https://newbuildings.org/los-angeles-mayor-garcetti-leading-the-way-to-decarbonization/>



Strategy 4: Support Resiliency and Grid Stability



The U.S. Department of Energy defines grid-interactive efficient buildings (GEBs) as energy efficient buildings with connected, smart, distributed energy resources (DERs) that are integrated and continuously optimized for the benefit of building owners, occupants and the electric grid. This strategy ensures that the energy efficiency and renewable generation efforts described above can be best leveraged to achieve a balanced grid, and will also help the City of San Diego remain functional during, or to bounce back quickly in response to, climate-driven energy disruptions from wildfires, floods and other severe weather events.



EFFICIENT

Persistent low energy use minimizes demand on grid resources and infrastructure



CONNECTED

Two-way communication with flexible technologies, the grid, and occupants



SMART

Analytics supported by sensors and controls co-optimize efficiency, flexibility, and occupant preferences



FLEXIBLE

Flexible loads and distributed generation/storage can be used to reduce, shift, or modulate energy use

Action 1: DEPLOY SMART, CONNECTED DERs

- Identify City buildings appropriate for installation of distributed energy resources like battery energy storage, electric vehicle charging stations, and microgrids that enable building energy loads to be dynamically shaped and optimized in response to grid signals.
- Identify City buildings appropriate for demand response technologies and activities. Deploy technologies and actions that adjust electricity demand according to the real-time needs of the grid and consumers to increase the economic value of site upgrades and decrease payback periods.
- Prioritize projects that provide increased resiliency for the City in preparation for our response to climate change-driven energy disruptions. Reference the Climate Resilient SD plan and departments that deploy critical City operations to determine the best locations for projects that significantly increase energy resiliency. Prioritize projects at municipal facilities that support Communities of Concern.
- Work closely with DoIT to ensure smart, connected technologies adhere to cybersecurity protocols. Ensure smart sensors and technologies that collect data adhere to City ordinances addressing privacy and surveillance.

⁷ <https://www.energy.gov/eere/buildings/grid-interactive-efficient-buildings>

Action 2: SECURE FUNDING FOR GEB PILOT PROJECTS

- Take advantage of generation incentives and local programs established by SDG&E and San Diego Community Power to improve the carbon profile of the City as a whole.
- Establish partnerships with GEB industry leaders to deploy demonstration projects at municipal facilities. Apply for and secure grant funding that allows GEB projects to proliferate across the City in both municipal and community buildings.

Project examples

FortZED, Fort Collins

FortZED is a public/private partnership between the City of Fort Collins, Colorado State University and Colorado Clean Energy Cluster businesses to accelerate solutions for the energy sector's most challenging problems. In 2007, the partners began work on a Net Zero Energy District – a two-square-mile area in downtown Fort Collins comprised of residential, commercial and university buildings. By 2011, the strategic integration of energy generation, storage and conservation activities allowed five participating downtown businesses to collectively reduce peak-load demand on a designated micro-grid within the ZED's boundaries by more than 20% during test periods that lasted more than four weeks. With energy-generating assets on site, and with more detailed data available, the partners are now far better positioned to make cost-effective decisions about operations and energy-related investments as FortZED development progresses.



Strategy 5: Engage and Educate



While many of the actions outlined above will be implemented behind the scenes across the City's building portfolio, City staff and patrons of the City's public buildings have a role to play in achieving the Municipal Energy Strategy's GHG reduction goals. This strategy describes ways staff and community members will be engaged in clean energy education, and how the City's clean energy projects can serve as training ground to help transform the local clean energy workforce.

Action 1: ENGAGE AND EDUCATE BUILDING OCCUPANTS AND PATRONS

- Develop and implement staff engagement campaigns that provide education about the City's Municipal Energy Strategy and the importance of energy efficiency and conservation in achieving the City's CAP goals and reducing the impacts of climate change.
- Provide building performance education to community members through informational dashboards in the lobbies of public-facing buildings like libraries and recreation centers. Partner with and support community stakeholders to develop and implement community engagement programs that leverage the information presented by the dashboards. Prioritize programming at municipal facilities that support Communities of Concern as they will be disproportionately affected by climate-related disruptions.

Action 2: TRAIN THE LOCAL WORKFORCE

- Take advantage of clean and efficient energy projects at municipal facilities to provide workforce education and training for local industry participants. Partner with labor unions and community organizations to develop programs that bring workforce education and training to the local clean energy workforce.
- Leverage municipal electrification efforts to help transform the market for building decarbonization. Partner with manufacturers and distributors to bring training to the local workforce to help build a local supply chain for alternative electric space and water heating technologies as the market advances.

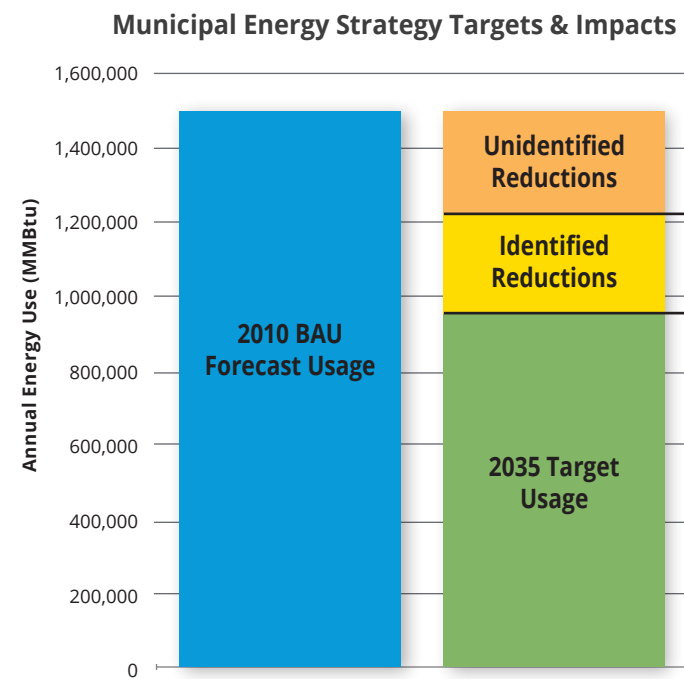
Project examples

Zero Net Energy Libraries

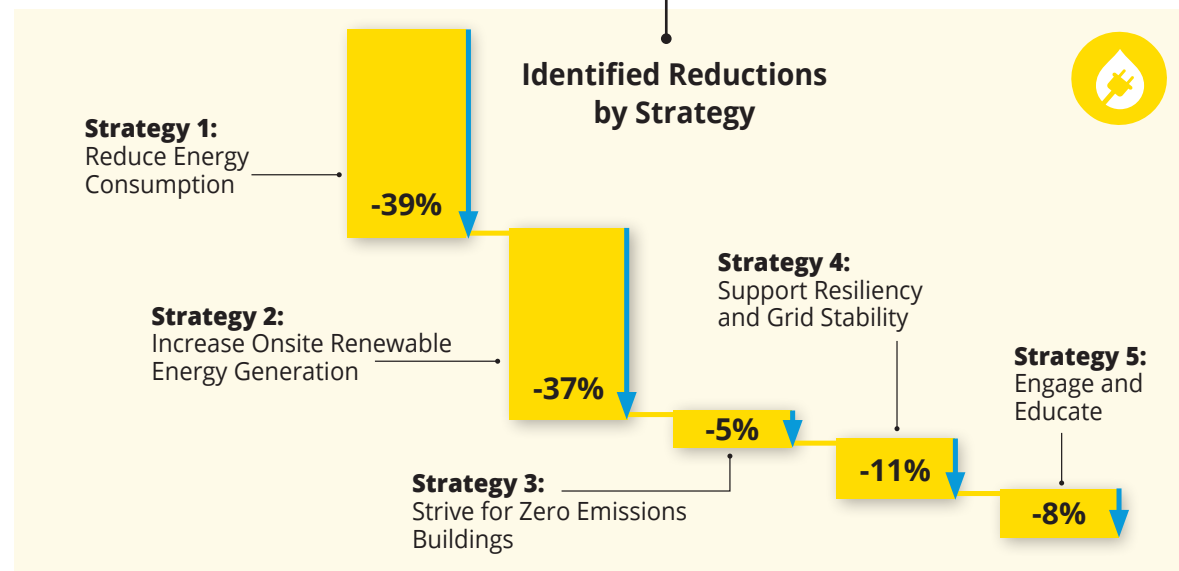
The Zero Net Energy (ZNE) Library project is bringing patron education and energy dashboards to three City facilities: Serra Mesa-Kearny Mesa, Valencia Park/Malcolm X and Point Loma/Hervey libraries. The dashboards located in the library lobbies display energy performance results for library patrons to view. The City is partnering with the San Diego Green Building Council to bring education events and resources to the patrons of each library, connecting these energy upgrades to the important role each community member plays in the fight against climate change.

Conclusion

The strategies outlined in this document are designed to achieve the ambitious municipal energy and GHG reduction goals established by the City of San Diego's Climate Action Plan. The table below demonstrates the energy reductions necessary to achieve those goals. Many clean energy projects, policies and programs have already been identified and are either currently under way or being considered for implementation in the near future. These efforts take the City approximately halfway toward the 2035 goal; anticipated savings are distributed across the five strategies as demonstrated by the yellow bars. The City must continue to identify additional projects, identified by the orange bar below, to achieve the necessary reductions.



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.





This information is available in alternative formats upon request.