The City of SAN DIEGO

Climate Action Plan
2023 Annual Report Appendix

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Introduction

The City of San Diego (City) adopted an updated Climate Action Plan (CAP) in 2022 with new sets of targets, measures, and actions.1 This is the first annual report monitoring the 2022 CAP. The City of San Diego's 2023 Climate Action Plan Annual Report (this report) provides additional information and data in the following three sections:

- Section A: Overview of 2019 – 2022 Greenhouse Gas Emissions
- Section B: 2022 Climate Action Plan Strategy Updates
- Section C: Methodology Differences and Data Refinement

Estimated total greenhouse gas (GHG) emissions in the City in 2022 were 8.6 million metric tons of carbon dioxide equivalent (MMT CO_2e), approximately 19% lower than the 2019 GHG emissions estimate of 10.6 MMT CO_2e. The five strategies in the 2015 CAP are: (1) decarbonization of the built environment; (2) access to clean and renewable energy; (3) mobility and land use; (4) circular economy and clean communities; (5) resilient infrastructure and healthy ecosystems; and (6) emerging climate actions. Under each strategy, the current state in 2019–2022 is presented first followed by updates of each action. Comparisons of the 2020, 2021, and 2022 status and the baseline estimates from 2019 are provided where possible.

In preparation for this report and the 2019–2022 GHG emissions inventory, revisions and refinements were made to the baseline 2019 GHG emissions estimates from previous Annual Reports and the 2022 CAP to reflect updated data as it became available. This updating approach follows the approach used by the California Air Resources Board (CARB) when updating the California statewide GHG inventory, and is based on the Intergovernmental Panel on Climate Change (IPCC) recommendations to maintain a consistent time-series when developing GHG inventories.[2] Revisions to previous estimates are explained in *Section C: Methodology Differences and Data Refinement* of this report. The updates to the CAP strategies performance metrics are described in *Section B: 2022 Climate Action Plan Strategy Updates.*

Section A: Overview of 2019 – 2022 Greenhouse Gas Emissions

GREENHOUSE GAS (GHG) EMISSIONS INVENTORY

The categories of emissions sources included in this update are consistent with the previous 2015 CAP Annual Reports, with the addition of off-road vehicle and equipment from construction. Categories include: on-road transportation, electricity, natural gas, water, wastewater, solid waste, and off-road construction. As in the previous years, these reflect the emission categories that are recommended in the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S.

1 City of San Diego: 2022 Climate Action Plan.
2 California Air Resources Board (CARB): California Greenhouse Gas Emissions for 2000 to 2020. Trends of Emissions and Other Indicators, p. 28 Additional Information (2020).

Community Protocol)[3] developed by ICLEI. These emission categories are routinely included in citywide inventories to ensure comparability across jurisdictions. GHG emissions from sources such as air travel, shipping, or other high global warming potential gases used in the City are not included. The 2019–2022 GHG emissions inventory results are shown in Table 1.

TABLE 1: CITY OF SAN DIEGO GREENHOUSE GAS EMISSIONS

Emissions Category	2019 Emissions [MT CO_2e] (Reported in 2022 CAP)	2019 Emissions Revised* [MT CO_2e] (per 2022 Annual Report)	2020 Emissions [MTCO_2e]	2021 Emissions [MTCO_2e]	2022 Emissions [MTCO_2e]	% Change 2021-2022	% Change 2019-2022
On-Road Transportation	5,805,000	5,854,000	4,650,000	4,683,000	4,628,000	-1%	-21%
Electricity	2,375,000	2,398,000	2,368,000	1,725,000	1,661,000	-4%	-31%
Natural Gas	1,911,000	1,912,000	1,827,000	1,918,000	1,837,000	-4%	-4%
Off-Road Transportation (Construction Equipment Only)	70,000	69,000	57,000	57,000	57,000	0%	-17%
Wastewater & Solid Waste	277,000	303,000	296,000	312,000	295,000	-5%	-3%
Water	68,000	61,000	70,000	70,000	74,000	6%	21%
Total Emissions	**10,532,000**	**10,597,000**	**9,268,000**	**8,765,000**	**8,552,000**	**-2%**	**-19%**

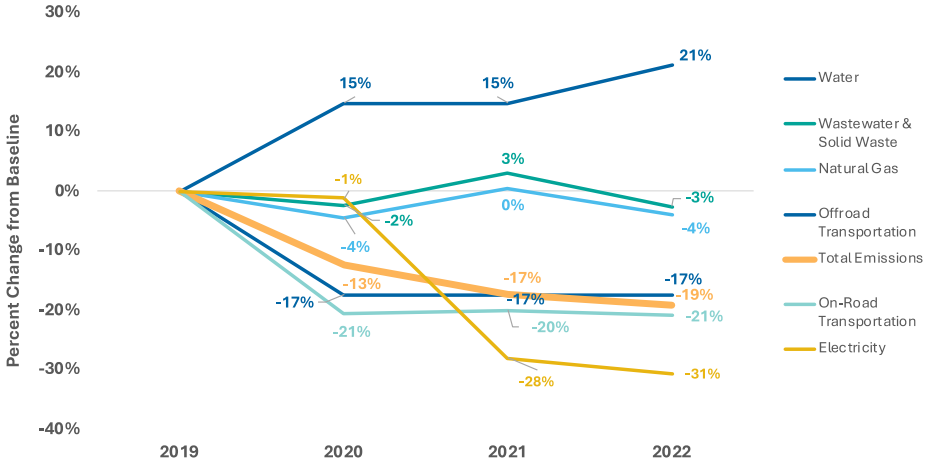
*This report will reference the 2019 Revised Emissions for the remainder of this report.
GHG emissions for each category and the totals are rounded to the nearest thousands. Sums may not add up to totals due to rounding.
MT CO2e = metric tons of carbon dioxide equivalent.
Energy Policy Initiatives Center, University of San Diego 2024

This report will reference the 2019 revised emissions for the remainder of the report, and will refer to them as the '2019 emissions.' More information on the methods, data availability, and sources used to calculate GHG emissions are provided in Section C: Methodology Differences and Data Refinement.

3 ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.0 (2012).

Figure 1 shows how emissions in each category have changed relative to 2019.

FIGURE 1: CITY OF SAN DIEGO GHG EMISSIONS COMPARISON TO 2019 BASELINE



In 2022, total emissions were 8.6 $MMTCO_2e$, a 19% reduction from the 2019 baseline and a 2% decrease from 2021. This decrease was mainly due to an increase of renewable electricity supplied to the City and increased on-road vehicle efficiency and adoption of electric and hybrid vehicles added. Although COVID-19 temporarily reduced on-road transportation emissions by lowering vehicle miles traveled, these miles are now returning to pre-pandemic levels. Despite this, emissions remain lower because the adoption of electric and hybrid vehicles has reduced the carbon intensity of on-road vehicles.

Furthermore, SDG&E has expanded its renewable electricity portfolio, and San Diego Community Power, the city's Community Choice Energy provider, now supplies electricity to commercial, industrial and residential sectors. This shift has decreased the carbon intensity of the city's electricity consumption, further reducing overall emissions.

For more information on sector-specific activities and GHG emissions, refer to Section B: 2022 Climate Action Plan Strategy Updates.

PER CAPITA GREENHOUSE GAS EMISSIONS

The 2019–2022 per capita GHG emissions in the City of San Diego are given in Table 2. This represents emissions from the six emissions categories analyzed.

TABLE 2: 2019-2022 PER CAPITA GHG EMISSIONS

Year	2019 Emissions	2020 Emissions	2021 Emissions	2022 Emissions
Total Emissions ($MMTCO_2e$)	10.60	9.27	8.77	8.55
Total Population	1,420,571	1,380,448	1,371,832	1,374,790
Per Capita GHG Emissions ($MTCO_2e$ per capita)	7.46	6.71	6.39	6.22

2019 population and housing estimates are based on the 2010 census benchmark, and 2020 and 2021 population and housing estimates are based on the 2020 census benchmark.

MT CO2e = metric tons of carbon dioxide equivalent

Per capita emissions based on six emission categories only and cannot be compared with California statewide per capita emissions or per capita emissions targets.

2019 population is based on 2010 census benchmark. 2020, 2021 and 2022 population and housing estimates are based on 2020 census benchmark.

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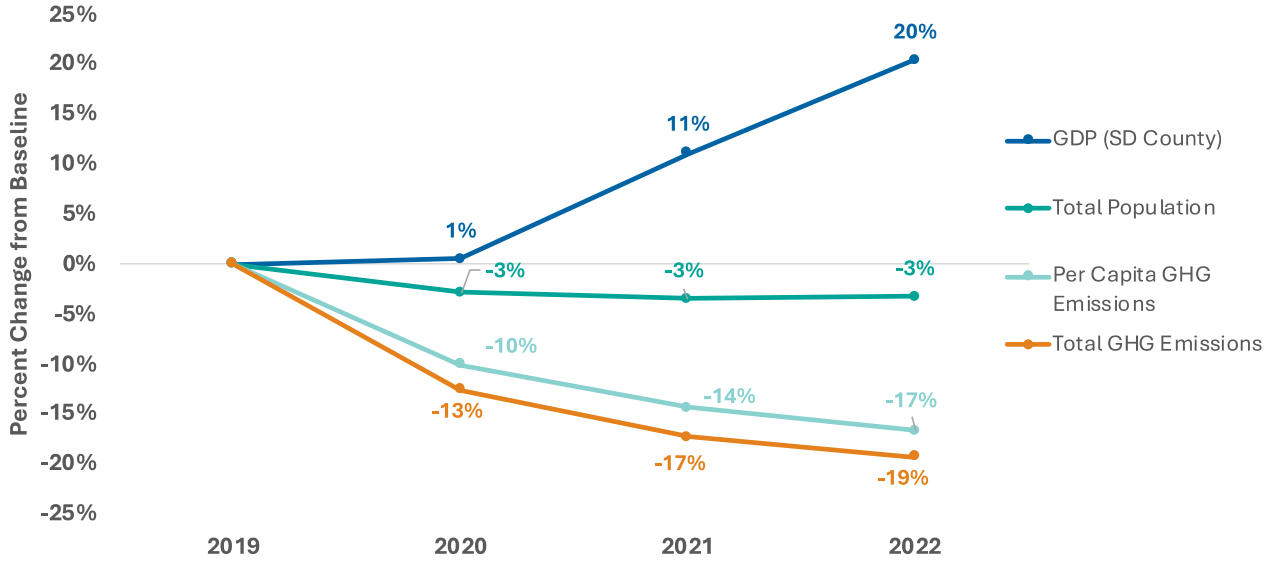
As mentioned previously, the GHG emissions categories and inventory methodology for the City of San Diego are based on the U.S. Communities Protocol, which requires five basic emissions-generating activities to be included in a Community GHG inventory. These categories are generally recognized as being under the collective control and management of the community whereas other emissions-generating activities such as air travel, shipping, off-road vehicles and equipment, or high global warming potential gases are not considered as such. Therefore, allocating emissions from such categories to cities is either not possible due to lack of data or lack of proxy data, is challenging, or is better handled at a higher level of aggregation. In contrast, the California statewide GHG emissions inventory includes all economic sectors of the state. Therefore, the estimated City per capita emissions cannot be compared directly with the California statewide per capita emissions or per capita emissions targets calculated using the CARB statewide inventory or statewide emissions targets, which include all economic sectors and additional emissions categories.

Figure 2 shows countywide GDP growth compared to City of San Diego population and GHG emissions changes since 2019. From 2019 to 2022, the per capita GHG emissions dropped by 17%, while the population remained largely stable.

FIGURE 2: CHANGES IN SAN DIEGO GDP, POPULATION, AND GHG EMISSIONS SINCE 2019



GDP listed is for San Diego County

CA Dept of Finance, U.S. Bureau of Economic Analysis, Energy Policy Initiatives Center, University of San Diego 2024

Section B: 2022 Climate Action Plan Strategy Updates

This section summarizes activity related to measures outlined in the 2022 Climate Action Plan. The City of San Diego's CAP Dashboard has up-to-date information and additional metrics tracking.

STRATEGY 1: DECARBONIZATION OF THE BUILT ENVIRONMENT

Baseline & Current State of Building Energy Use in the City of San Diego:

Building energy-related emissions (fossil-fuel based electricity and natural gas consumption) accounted for 41% of total city-wide emissions, though the sector had a 19% reduction from the 2019 baseline (31% reduction in emissions from electricity and 4% from natural gas) and a 4% reduction from 2021.

Electricity Consumption & Emissions:

The 2019-2022 grid supplied electricity is provided in Table 3. For electricity users with on-site electric generation, only the net electricity from the grid has been included.

TABLE 3: TOTAL GRID-SUPPLIED ELECTRICITY USE IN CITY OF SAN DIEGO

	2019	2020	2021	2022	% Change 2021-2022	% Change 2019-2022
Electricity Consumption (MWh)	7,312,722	7,198,617	6,957,279	7,137,087	3%	-2%
Emissions from Electricity ($MTCO_2e$)	2,398,000	2,368,000	1,725,000	1,661,000	-4%	-31%

MWh = megawatt hour, MT CO2e = metric tons of carbon dioxide equivalent

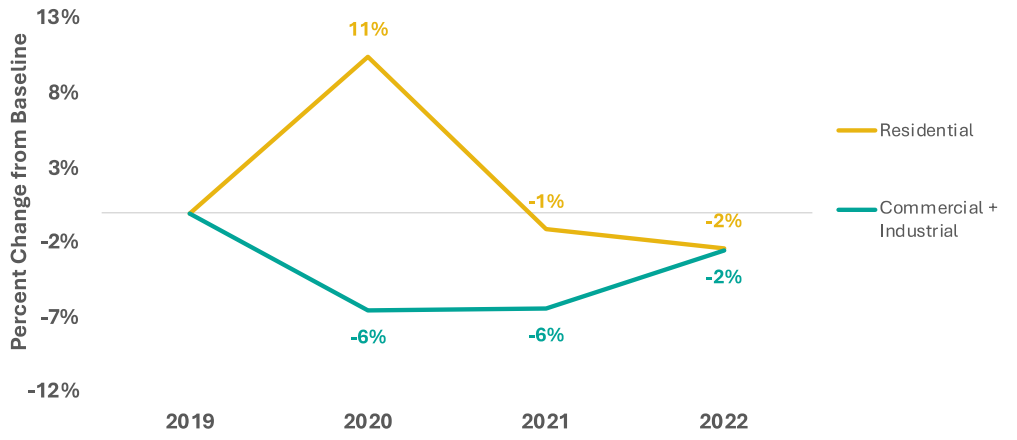
The MWhs do not include transmission and distribution losses, or self-serve behind-the-meter electricity generation (i.e., rooftop PV systems). The electricity sales data do not include the electricity sales to San Diego County Regional Airport Authority, San Diego Unified Port District and military. The emissions calculation includes the electricity transmission and distribution losses.

GHG emissions are rounded to the nearest thousands. The emissions from electricity were calculated based on City of San Diego's grid supply and power mix specifically, which may differ from other jurisdictions in San Diego region. The GHG emissions include emissions from transmission and distribution losses.

SDG&E 2022, Energy Policy Initiatives Center, University of San Diego 2024

Electricity use changes compared to a 2019 baseline is shown in Figure 3.

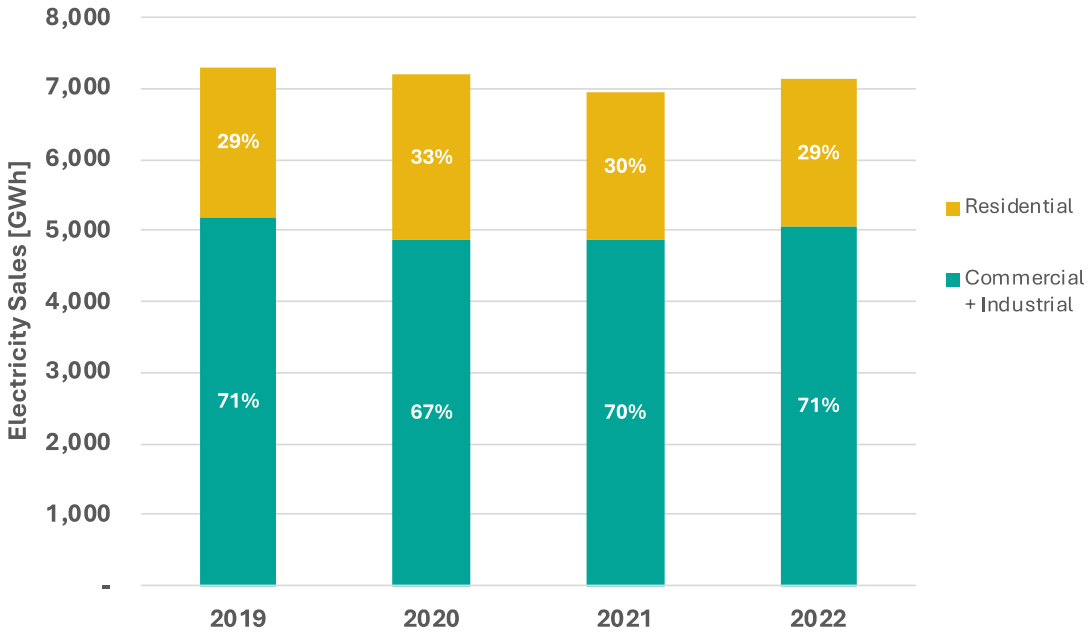
FIGURE 3: GRID-SUPPLIED ELECTRICITY CONSUMPTION CHANGES FROM 2019 BASELINE



SDG&E 2019 – 2022, SDCP 2021-2022

A comparison of the grid-supplied electricity use by customer class in 2019–2022 is shown in Figure 4.

FIGURE 4: GRID-SUPPLIED ELECTRICITY USE BY CUSTOMER CLASS IN CITY OF SAN DIEGO [2019–2022]



SDG&E's electricity sales in City of San Diego. Sales do not include transmission and distribution losses, and exclude sales to San Diego County Regional Airport Authority, San Diego Unified Port District, and the military.

Percentages may not sum up to totals due to rounding.

SDG&E 2019-2022

Natural Gas Consumption & Emissions:

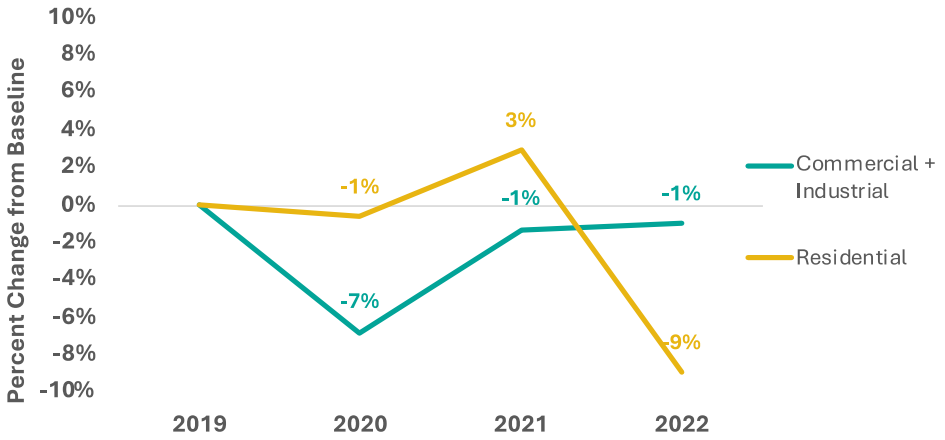
Table 4 provides natural gas end use in 2019–2022. City-wide natural gas end use is 4% lower since both the baseline and 2021, showing a fluctuating energy use.

TABLE 4: TOTAL NATURAL GAS DELIVERED BY SDG&E IN CITY OF SAN DIEGO						
Year	**2019**	**2020**	**2021**	**2022**	**% Change 2021-2022**	**% Change 2019-2022**
Natural Gas Use (million Therms)	351	335	352	337	-4%	-4%
Emissions from Natural Gas ($MTCO_2e$)	1,912,000	1,827,000	1,918,000	1,837,000	-4%	-4%
The natural gas sales data do not include the sales to San Diego County Regional Airport Authority, San Diego Unified Port District and military. SDG&E 2022, Energy Policy Initiatives Center, University of San Diego 2024						

Natural gas use changes compared to a 2019 baseline is shown in

Figure 5.

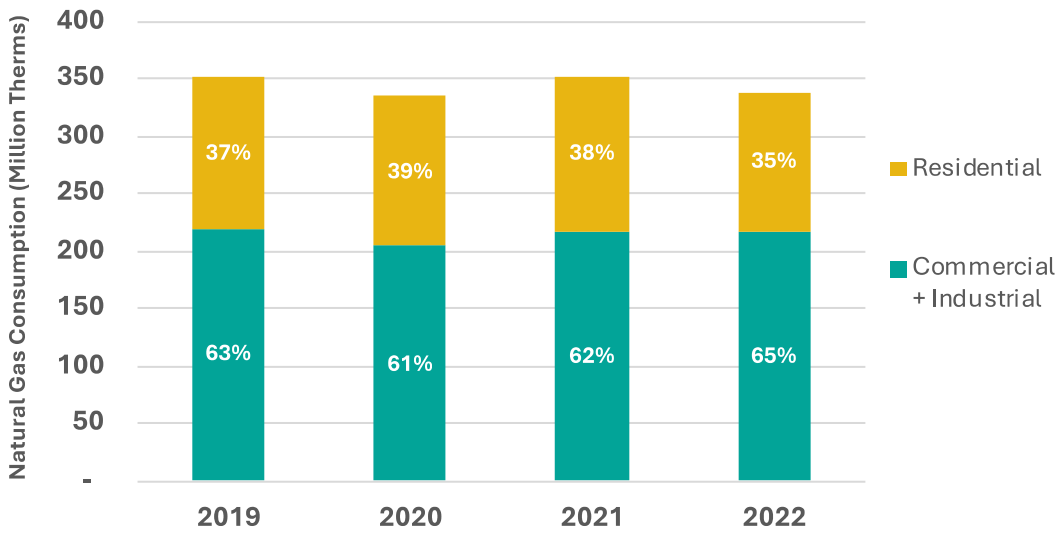
FIGURE 5: NATURAL GAS CONSUMPTION CHANGES FROM 2019 BASELINE



SDG&E 2019 – 2022

A comparison of the natural gas use by customer class in 2019–2022 is shown in Figure 6.

FIGURE 6: NATURAL GAS USE BY CUSTOMER CLASS IN CITY OF SAN DIEGO [2019–2022]



SDG&E 2019–2022

Target Progress: Reduce Natural Gas Use in New & Existing Buildings

Measure 1.1: Decarbonize Existing Buildings

- 2030 Target: Phase out 45% of natural gas usage from existing buildings
- 2035 Target: Phase out 90% of natural gas usage from existing buildings

Measure 1.2: Decarbonize New Building Development

- 2030 Target: All-electric reach code starting 2023 at new residential and commercial development
- 2035 Target: Ongoing implementation of all-electric new residential and commercial development

Table 5 provides the electricity and natural gas end-use in million British Thermal Units (MMBtu). MMBtu is a common unit of energy used to enable comparison of the energy content of different fuel types. In this case electricity in kilowatt-hours (kWh) and natural gas in units of therms are converted to the same MMBTU unit. Total 2022 citywide energy consumption is 3% lower than 2019 levels.

TABLE 5: TOTAL ELECTRICITY AND NATURAL GAS DELIVERED BY SDG&E IN CITY OF SAN DIEGO

Year	2019	2020	2021	2022	% Change 2021-2022	% Change 2019-2022
Electricity (MMBtu)	24,951,000	24,562,000	23,738,000	24,352,000	3%	-2%
Natural Gas (MMBtu)	35,057,000	33,483,000	35,159,000	33,673,000	-4%	-4%
Total Energy (MMBtu)	60,008,000	58,045,000	58,897,000	58,025,000	-1%	-3%
Emissions from Energy Use ($MMTCO_2e$)	4.3	4.2	3.6	3.5	-4%	-19%

MMBtu = million British Thermal Units

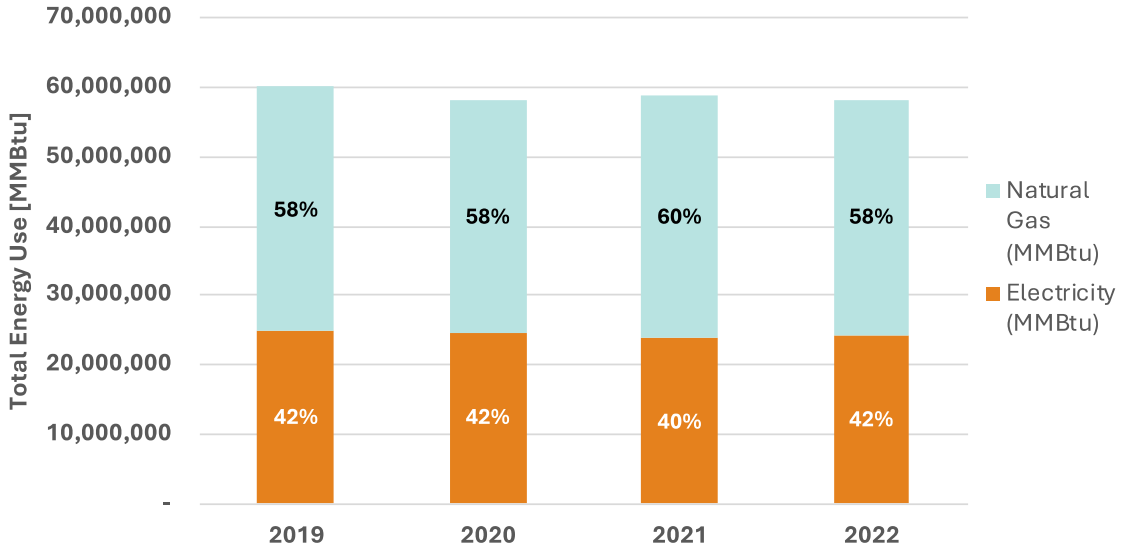
Conversion factors are 293 kWh/MMBtu and 10 therms/MMBtu

MMTCO2e = million metric tons carbon dioxide equivalent

SDG&E 2022, Energy Policy Initiatives Center, University of San Diego 2024

A comparison of the total energy use for 2019–2022 is shown in Figure 7.

FIGURE 7: TOTAL ENERGY USE IN CITY OF SAN DIEGO [2019–2022]



SDG&E 2019 - 2022, Energy Policy Initiatives Center, University of San Diego 2024

Target Progress: Decarbonize City Facilities

Measure 1.3: Decarbonize City Facilities

- 2030 Target: Phase out 50% of natural gas usage in municipal facilities
- 2035 Target: Phase out 100% natural gas usage in municipal facilities

Total energy use for municipal operations in 2022 was 9% lower than in 2021 and 13% lower than the baseline year of 2019. Table 6 shows both electricity and natural gas use by municipal operations. This data includes energy use for facilities other than buildings (streetlights, traffic lights, etc.), but does not include natural gas use for City vehicles. In future years, this data will be disaggregated for clarity on progress toward Measure 1.3.

TABLE 6: ENERGY USE IN MUNICIPAL BUILDINGS

Energy Use	2019	2020	2021	2022	% Change 2021-2022	% Change 2019-2022
Grid Electricity (MWh)	210,794	203,900	190,152	191,155	1%	-9%
Grid Electricity (MMBtu)	718,704	695,198	648,326	651,744	1%	-9%
Natural Gas (million therms)	3.8	3.3	3.9	3.0	-24%	-21%
Natural Gas (MMBtu)	381,302	330,976	394,156	300,436	-24%	-21%
Total Energy Use (MMBtu)	1,100,006	1,026,174	1,042,482	952,180	-9%	-13%

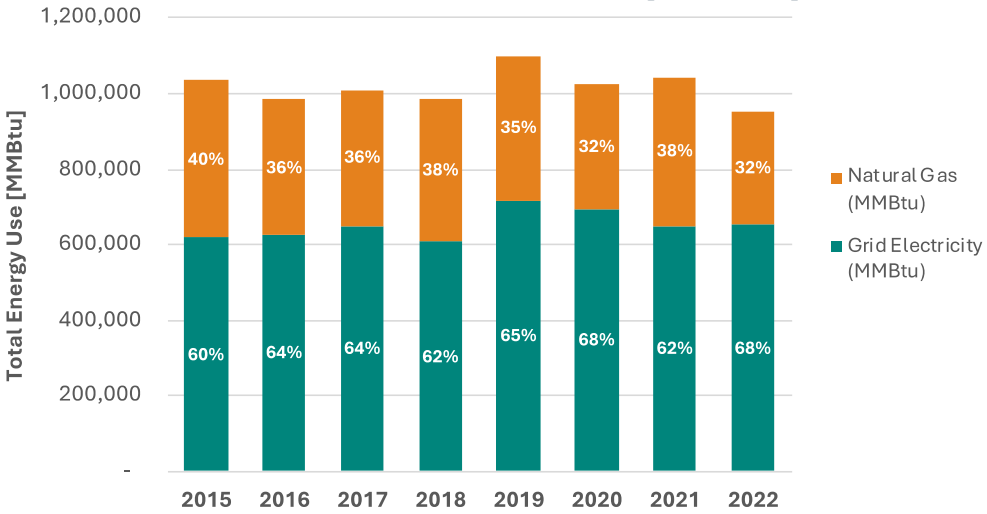
Natural Gas Emissions does not include natural gas use for vehicles.

City of San Diego Sustainability & Mobility Department

The trend in energy use for municipal operations from 2015 to 2022 is given in

Figure 8.

FIGURE 8: MUNICIPAL ENERGY USE [2015–2022]



SDG&E grid purchases only. Does not include on-site electricity generation.
Does not include natural gas purchases for CNG vehicles.
City of San Diego Sustainability & Mobility Department

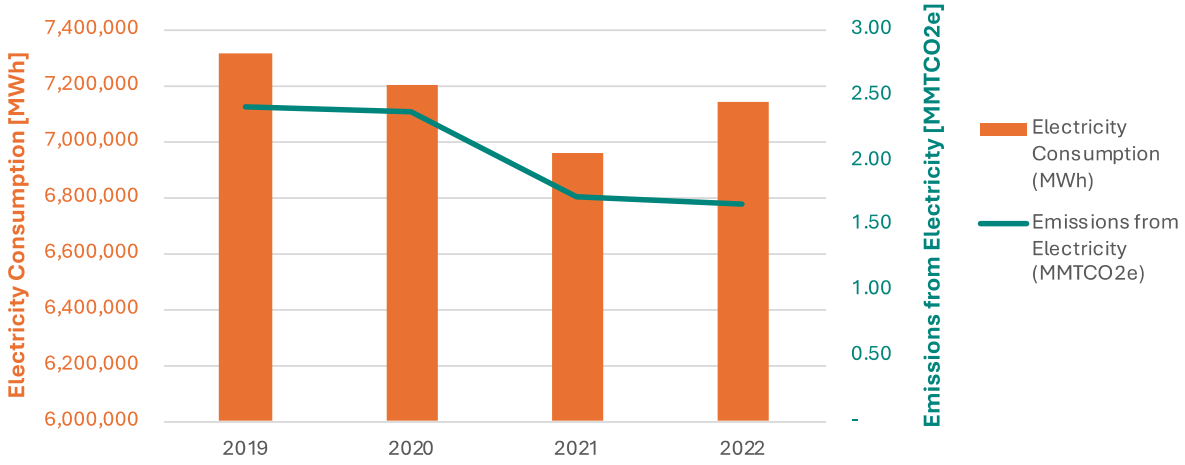
STRATEGY 2: ACCESS TO CLEAN AND RENEWABLE ENERGY

Baseline and Current State of Renewable Energy Access in the City of San Diego:

While electricity consumption remained relatively stable from 2019–2022, emissions from energy consumption decreased by 31% from 2019 baseline as shown previously in Table 3 above and in Figure 9. This is due to a reduction in the carbon intensity of energy provided to City customers.

San Diego Gas & Electric (SDG&E)'s renewable electricity supply increased from 31% in 2019 to 45% in 2022, as shown in Table 7. In March 2021, SDCP started serving jurisdictions in the San Diego region, including the City of San Diego. By the end of 2021, eligible SDG&E bundled commercial and industrial customers were enrolled in SDCP automatically with the option to opt-out (return to SDG&E) or opt-up to a SDCP product with 100% renewable electricity. In early 2022, eligible SDG&E bundled residential customers were then enrolled in SDCP automatically with the same option to opt-out or opt-up. Emissions are based on a weighted average of SDG&E bundled, SDCP Power On, SDCP Power 100, and Direct Access consumption and their associated emission factors.

FIGURE 9: ELECTRICITY CONSUMPTION AND EMISSIONS IN THE CITY OF SAN DIEGO [2019–2022]



SDG&E 2019 - 2022, Energy Policy Initiatives Center, University of San Diego 2024

Target Progress: Increase Access to Grid Renewables

Measure 2.1: Citywide Renewable Energy Generation

- 2030 Target: 100% renewable or GHG-free power for all SDCP customers in the City of San Diego
- 2035 Target: 100% renewable or GHG-free power for all SDCP customers in the City of San Diego

Percent of renewables in grid-provided electricity through both SDG&E and SDCP from 2019–2022 is outlined in Table 7.

TABLE 7: PERCENTAGE OF RENEWABLES IN GRID ELECTRICITY SUPPLY

Year	Renewables in Grid Electricity Supply
2019	31% (SDG&E)
2020[1]	31% (SDG&E)
2021[2]	44.5% (SDG&E) 54.9% (San Diego Community Power)
2022	44.8% (SDG&E) 54.2% (San Diego Community Power "Power On" Mix) 100% (San Diego Community Power "Power 100" Mix)

The percent renewable is for the electricity SDG&E supplied to its bundled customers; it does not represent the renewable content of the electricity supplied to SDG&E's Direct Access customers and does not account for behind-the-meter renewable supply.

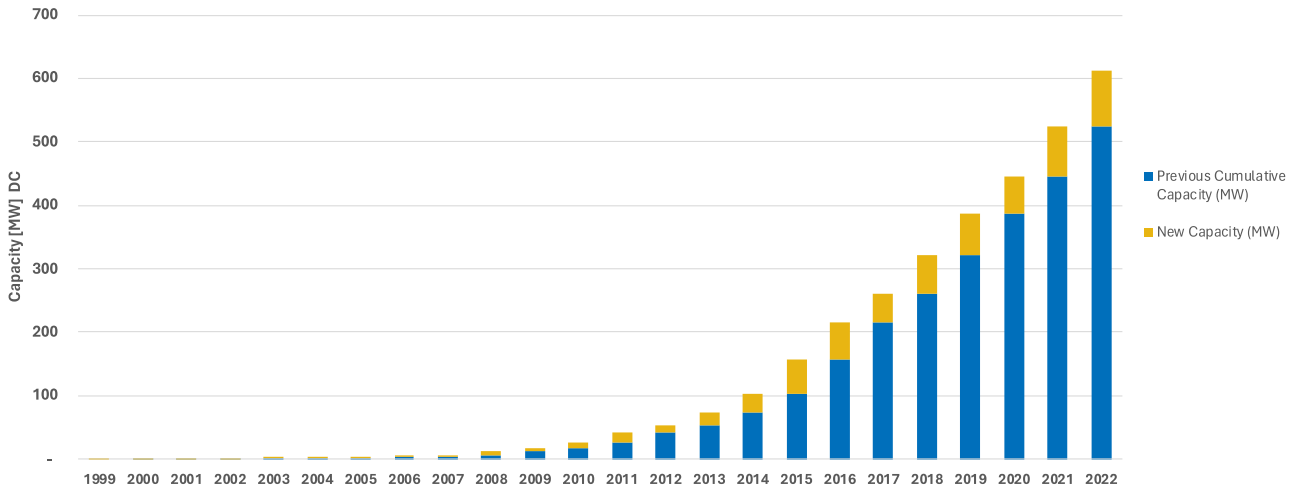
[1]The California Energy Commission has updated the method to report renewable content in the Power Source Disclosure Program. The percentage starting 2022 does not reflect the supplier's Renewables Portfolio Standard compliance, and does not include unbundled renewable energy credits.

[2]San Diego Community Power started serving jurisdictions in the San Diego region, including the City of San Diego, in March 2021.

California Energy Commission 2024

In 2022, solar projects for residential customers accounted for 88% of new solar capacity (approximately 76 out of 87 MW) and 99% of projects. The cumulative capacity of interconnected PV systems installed between 1999 and the end of 2022 was 611 MW in the City. Figure 10 shows the new capacity added each year and prior year's cumulative capacity.

FIGURE 10: BEHIND-THE-METER PV IN CITY OF SAN DIEGO [1999–2022]



California Distributed Generation Statistics database, net energy metering (NEM)
SDG&E Interconnected Project Sites Database
Energy Policy Initiatives Center University of San Diego, 2024

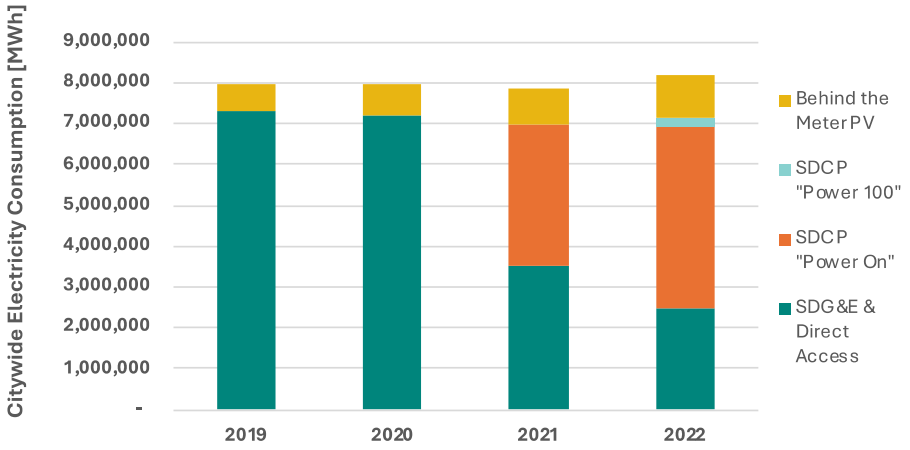
The City also has numerous facilities with on-site renewable generation, including: (1) combined heat and power generation using landfill gas or digester gas at Metropolitan Biosolids Center and Point Loma Wastewater Treatment Plant; (2) hydroelectric generation at Point Loma Wastewater Treatment Plant ocean outfall; and (3) PV systems at water treatment facilities, libraries, recreation centers and fire stations. Total municipal on-site generation for 2021 and 2022 is shown in Table 8.

TABLE 8: MUNICIPAL ON-SITE GENERATION [2021–2022]

Municipal On-Site Generation	Estimated Annual Output 2021 (kWh)	Estimated Annual Output 2022 (kWh)
Solar	4,370,772	4,511,145
Hydroelectric	Not estimated	Not estimated
Co-gen with Biogas	28,156,816	23,200,496
Power Plant with Landfill Gas	25,107,338	6,084,753
Co-gen with Landfill Gas	43,463,260	43,462,998

Total energy consumption and generation source is shown in Figure 11, including grid-supplied electricity from SDCP and SDG&E bundled, Direct Access, and behind-the-meter PV.

FIGURE 11: CITYWIDE ENERGY CONSUMPTION FROM SDG&E, SDCP, BEHIND METER PV [2019–2022]



California Distributed Generation Statistics database, net energy metering (NEM)
SDG&E Interconnected Project Sites Database
Energy Policy Initiatives Center, University of San Diego, 2024

Target Progress: Increase Municipal Zero Emission Vehicles

Measure 2.2: Increase Municipal Zero Emission Vehicles

- 2030 Target: Percent of all municipal fleet vehicles to be ZEVs:
  Cars 75%, LDV 50%, MDV 50%, HDV 50%
- 2035 Target: Percent of all municipal fleet vehicles to be ZEVs:
  Cars and LDV 100%, MDV 75%, HDV 75%

As of 2022, 5% of the City's vehicle fleet of 4,344 vehicles were zero emission vehicles (ZEVs), including 127 battery electric vehicles (BEVs) and 119 plug-in hybrid electric vehicles (PHEVs). Table 9 shows the percentage of ZEVs in the Municipal fleet from 2016–2022.

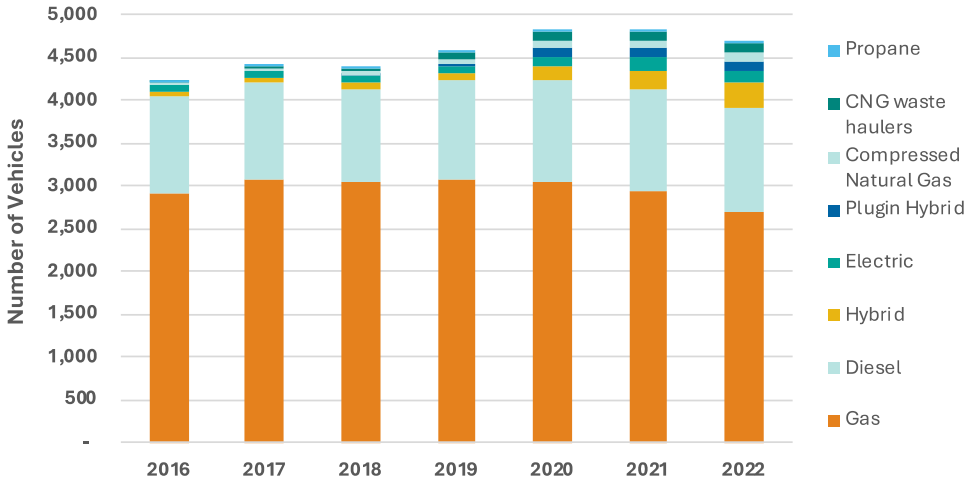
TABLE 9: PERCENT OF ZEVS IN MUNICIPAL VEHICLE FLEET [2016–2022]

Calendar Year	2016	2017	2018	2019	2020	2021	2022
Percent of ZEVs in Municipal Fleet	2.1%	2.0%	2.0%	2.2%	4.5%	5.2%	5.4%

City of San Diego Sustainability and Mobility Department

The City also had 302 gasoline-electric hybrids and 99 CNG waste trucks. Figure 12 shows the breakdown of Municipal vehicles from 2016 to 2022.

FIGURE 12: VEHICLE TYPES IN MUNICIPAL FLEET [2016–2022]

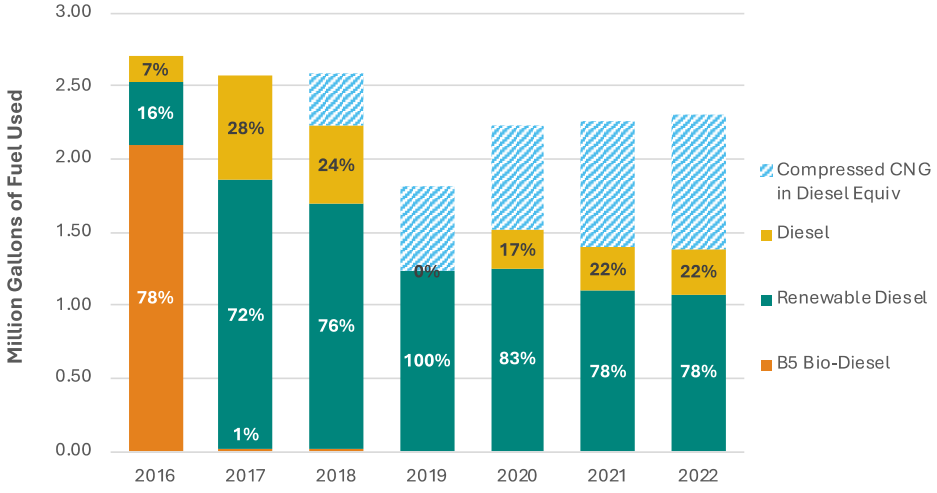


City of San Diego Sustainability and Mobility Department

Supporting Action Progress: Convert All Diesel Consumption to Renewable Diesel and Waste Collection Trucks to Low-Emissions Fuel

In 2016, the City municipal fleet started the transition to 100% renewable diesel to help meet the CAP supporting action of reducing municipal fuel GHG emissions during the transition to ZEVs. The percentage of renewable diesel in the overall fuel used increased from 16% in 2016 to 78% in 2022 as shown in Figure 13. Additionally, in 2022, the number of compressed natural gas (CNG) waste collection trucks in service has increased steadily in recent years from 68 in 2019, and 91 in 2020, to 102 in 2022. CNG vehicles represents more than 70% of the waste collection truck fleet. CNG, a low emission fuel compared with diesel, has displaced diesel fuel use as shown in Figure 13.

FIGURE 13: MUNICIPAL FLEET COMPRESSED NATURAL GAS AND DIESEL FUEL USE BY TYPE [2016–2022]



City of San Diego Sustainability and Mobility Department

Consistent with the CARB statewide GHG Inventory and the IPCC Guidelines, the CO_2 emissions from biofuel (e.g., ethanol, biodiesel, and renewable diesel) are classified as "biogenic CO_2" and not included in the GHG inventory. Only the CH_4 and N_2O emissions from biofuel are accounted for in the GHG inventory. For regular diesel, all CO_2 CH_4 and N_2O emissions are accounted for in the GHG inventory.

The 2010 to 2022 City fleet gasoline consumption is given in Table 10.

TABLE 10: CITY FLEET GASOLINE CONSUMPTION

Year	Total Gasoline (gallons)
2019	2,047,504
2020	2,154,536
2021	2,090,527
2022	2,060,978

Updates to 2020 and 2021 data reflects updated primary data from the City of San Diego.
City of San Diego Sustainability and Mobility Department

Target Progress: Increase Citywide Zero Emission Vehicles

Measure 2.3: Increase Electric Vehicle Adoption

- 2030 Target: 16% e-VMT out of all Light-duty VMT
- 2035 Target: 25% e-VMT out of all Light-duty VMT

The emissions impact of zero-emission vehicles (ZEVs) policies and programs is included in GHG reduction from State polices and actions, not as a result of a particular CAP strategy. However, the impact is reflected at the local level. While data for registered ZEVs is not available at the city level, the total number of registered ZEVs in San Diego County, including battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) shown in Table 11.

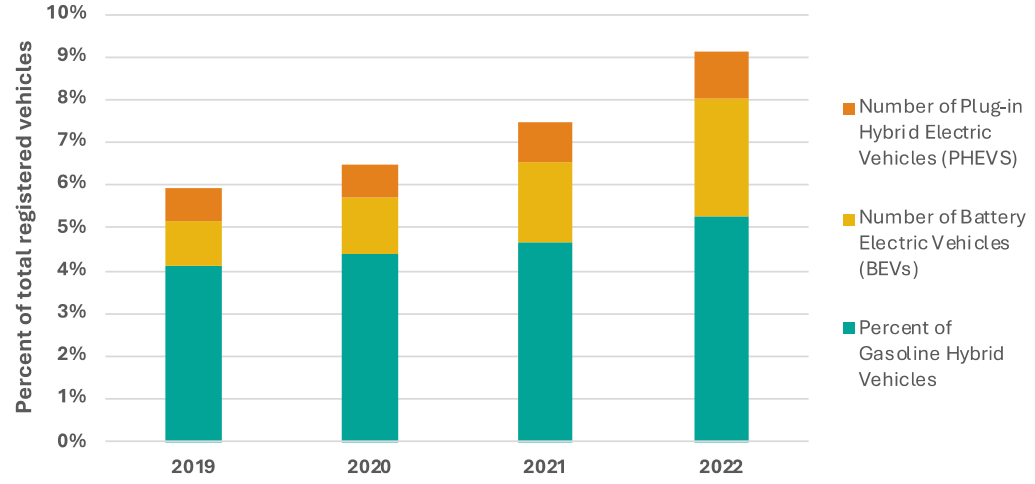
TABLE 11: NUMBER OF REGISTERED ELECTRIC VEHICLES IN SAN DIEGO COUNTY

Number of Vehicles	2019	2020	2021	2022	% Change 2021-2022	% Change 2019-2022
Number of Battery Electric Vehicles (BEVs)	25,673	32,057	45,979	67,444	47%	163%
Number of Plug-in Hybrid Electric Vehicles (PHEVs)	18,309	19,559	23,785	27,165	14%	48%
Total Number of Electric Vehicles (BEVs + PHEVs)	43,982	51,616	69,764	94,609	36%	115%
Total Number of Registered Vehicles	2,453,257	2,425,831	2,514,519	2,446,883	-3%	0%
Percent of Electric Vehicles to All Registered Vehicles	1.8%	2.1%	2.8%	3.9%	39%	116%

California Energy Commission 2019 – 2024

The number of ZEVs has more than doubled from 2019 to 2022. In 2022, approximately 4% of all registered vehicles in the County were ZEVs. Gasoline hybrids and ZEVs as a percentage of total registered vehicles in San Diego County is shown in Figure 14. The percentages shown do not represent ZEV market share (the percentage of new ZEVs sold out of all new vehicles sales). ZEVs accounted for approximately 8% of market share in the state in 2020, and 20% in 2022.

FIGURE 14: PERCENT OF HYBRID AND ELECTRIC VEHICLES IN SAN DIEGO COUNTY [2019–2022]



California Energy Commission 2019 – 2024

The increasing number of EVs leads to increasing demand for EV charging. Table 12 shows the number of public electric vehicle charging stations (EVCSs) and the number of EVCSs offered through SDG&E's Power Your Drive program at multi-family buildings and workplaces within the City.

TABLE 12: ESTIMATED NUMBER OF ELECTRIC VEHICLE CHARGING STATIONS

Number of Charging Sites or Chargers	2019	2022
Number of EVCSs	300	719
Number of Public Level 2 EVCSs at all Sites	932	1557
Number of Public DC Fast EVCSs at all Sites	230	325
Number of SDG&E Power Your Drive EVCSs	1,755	Program expired

EVCS = electric vehicle charging station
Number of EVCSs are the number of nozzles or plugs. One site may have more than one nozzle or plug. EVCSs installed through SDG&E's Power Your Drive program are not considered public chargers as they are installed primarily at workplaces (including municipal facilities) and multi-family buildings (apartments and/or condo buildings).
Data do not include other private workplace or in-home (e.g. single-family homes) charging stations.
SDG&E 2019, Energy Policy Initiatives Center, University of San Diego 2024

STRATEGY 3: MOBILITY AND LAND USE

Baseline and Current State of Transportation in the City of San Diego

Transportation accounted for 54% of all GHG emissions within the City of San Diego in 2022. Strategy 3 aims to reduce vehicle miles traveled (VMT) by increasing the use of mass transit, bicycling, and walking throughout the city.

The 2019–2022 VMT and on-road transportation emissions in the City of San Diego are shown in Table 13. The impact of the COVID-19 pandemic on VMT in 2020 and 2021 was estimated from 2016 VMT using the 2016–2021 regional public road VMT monitoring data, which showed that the decrease was mostly likely from light-duty vehicles after shelter-in-place orders were enacted in 2020. However, emissions from on-road transportation have been increasing since 2020. This is evidence that the full impact of the COVID-19 pandemic on driving may not be sustained long term. The data sources and method to calculate on-road transportation emissions are provided in the supplemental inventory documentation to this report.

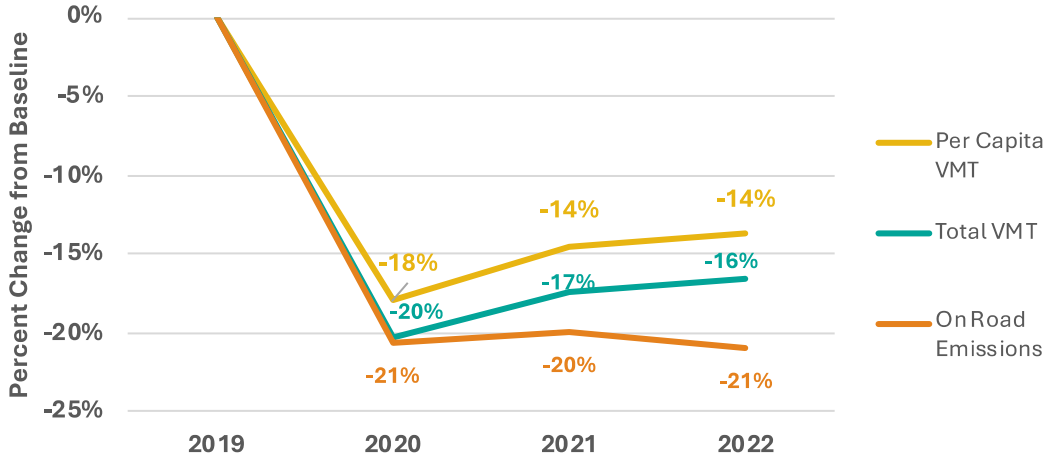
TABLE 13: VEHICLE MILES TRAVELED (VMT) IN CITY OF SAN DIEGO				
Year	2019	2020	2021	2022
Total VMT (million miles/year)	13,666	10,891	11,228	11,416
San Diego Regional Average Vehicle Emission Rate (g CO_2e/mile)	428	427	415	405
GHG Emissions (MT CO_2e)	5,854,000	4,650,000	4,683,000	4,628,000

The 2019 VMT are estimates based on the 2016 City of San Diego VMT estimates from SANDAG's Activity Based Mode l (ABM2+) and Final 2021 Regional Plan, multiplied by the 2016-2022 San Diego regional VMT annual rates of growth. Annual rates of growth are estimated from the annual California Department of Transportation (CalTrans) Highway Performance Monitoring System public road data and Performance Measure System freeway data.

SANDAG 2021, CalTrans, CARB2021, Energy Policy Initiatives Center, University of San Diego 2024

Figure 15 shows the changes to total VMT, per capita VMT, and on-road emissions in relation to the 2019 baseline.

FIGURE 15: CHANGES IN VMT, PER CAPITA VMT, AND ON-ROAD EMISSIONS FROM 2019 BASELINE

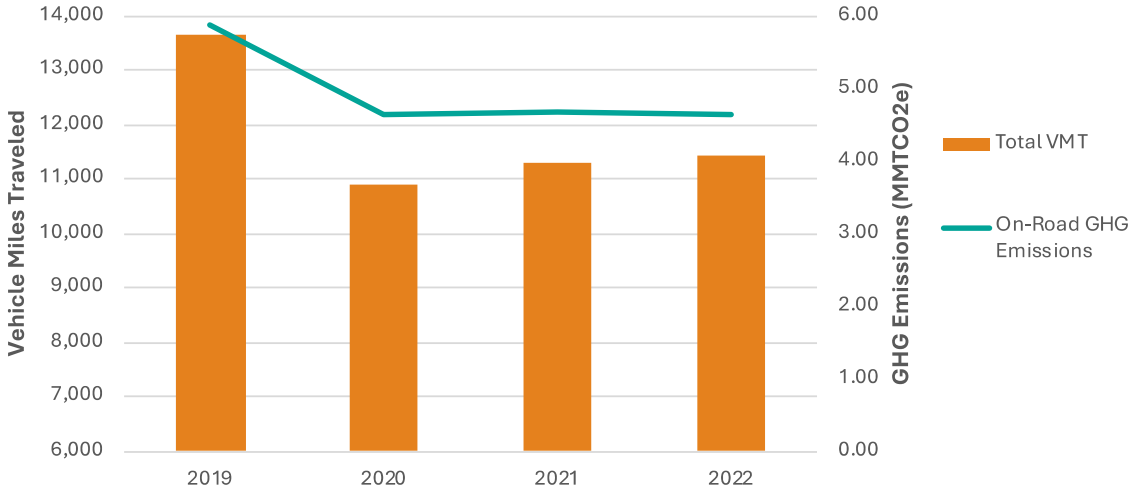


SANDAG 2021, CalTrans, CARB2021, Energy Policy Initiatives Center, University of San Diego 2024

Similar to the electricity sector, due to reduction in carbon intensity per mile, emissions from on-road transportation are lower in 2022 despite the increase in VMT since 2020, as shown in

Figure 16.

FIGURE 16: ON ROAD EMISSIONS VS. VEHICLE MILES TRAVELED IN THE CITY OF SAN DIEGO [2019–2022]



SANDAG 2021, CalTrans, CARB2021, Energy Policy Initiatives Center, University of San Diego 2024

Target Progress: Reducing Vehicle Miles Traveled

Measure 3.1: Safe and Enjoyable Routes for Pedestrians and Cyclists

- 2030 Target: 19% walking and 7% cycling mode share of all San Diego resident trips
- 2035 Target: 25% walking and 10% cycling mode share of all San Diego resident trips

While mode share data for all City of San Diego resident trips is not available at this time, data is available for trips related to work commuting. Resident commute trips by transportation mode are shown in Table 14.

TABLE 14: PERCENT OF MODE SHARE FOR EMPLOYEE COMMUTE

Mode	2019	2023
Drive Alone	78	75
Carpool	12	13
Transit	6	7
Walk	2	3
Bike or E-Bike	2	3
TNC or Taxi	0	<1%

SANDAG Employment Centers 1.0 and 2.0

Bicycle facility improvements from 2013 to 2022 are shown in Table 15. Class I bike lanes are paved right-of-way for exclusive use by bicyclists, pedestrians and other non-motorized modes of travel. Class II bike lanes are defined by pavement striping and signage used to allocate a portion of a roadway for exclusive or preferential bicycle travel. Class IV bike lanes are referred to as "protected bike lanes" and are lanes specifically separated from motor traffic and distinct from the sidewalk.

TABLE 15: BICYCLE FACILITIES IMPROVEMENTS SINCE 2013											
Year	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**Total Since 2013**
New Class I Bike Lane Miles Added	-		-	-	2.1	-	-	-	-	-	2.1
New Class II Bike Lane Miles Added	6.9	10.5	14.6	12.7	7.9	11.5	10.8	2.2	17.4	52.4	185.1
New Class IV Bike Lane Miles Added	-	-	-	-	-	-	2	3.7	34.2	34.9	103.5
Existing Bike Lane Miles Improved	35.7	51.7	42.2	43.6	21.4	2.3	34.6	81.6	65.3	15.2	393.6
Existing Bike Lane Miles Replaced	1.3	1.6	-	-	-	27.9	-	-	-	-	30.8
Total Added or Improved Miles	43.9	63.8	56.8	56.8	31.4	41.7	47.4	87.5	103.6	102.4	702.3

Data provided for bicycle facility improvements pertains to fiscal year progress. The remainder of the report uses calendar years to track emissions and progress.

City of San Diego Transportation and Storm Water Department

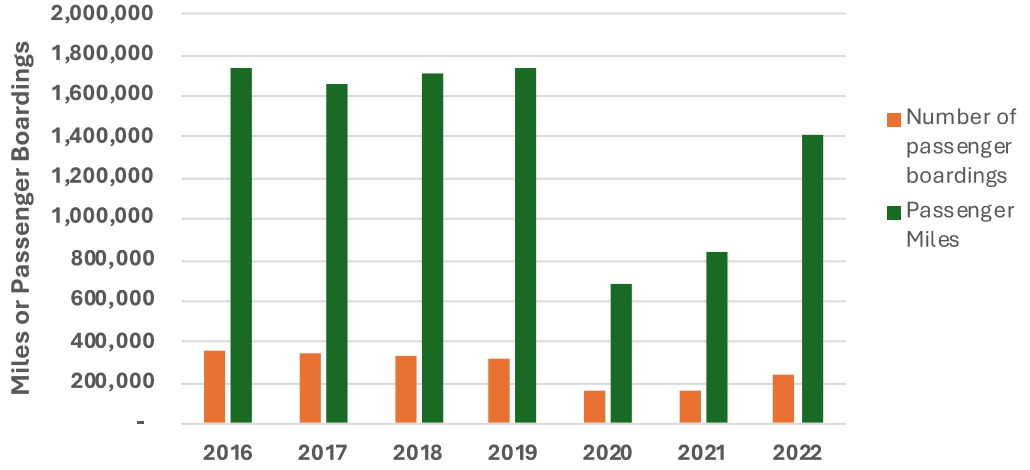
Measure 3.2: Increase Safe, Convenient and Enjoyable Transit Use

- 2030 Target: 10% transit mode share of all San Diego resident trips
- 2035 Target: 15% transit mode share of all San Diego resident trips

Ridership data specific to the City of San Diego is currently not available, so regional data is used as a proxy. While regional transit ridership is increasing between 2020 and 2022, as shown in

Figure 17, regional ridership is still below pre-pandemic levels.

FIGURE 17: REGIONAL TRANSIT BOARDINGS AND PASSENGER MILES [2016–2022]



SANDAG Weekday Transit Ridership

Measure 3.3: Work from Anywhere

- 2030 Target: Achieve 4% citywide VMT reduction through telecommute
- 2035 Target: Achieve 6% citywide VMT reduction through telecommute

While data specific to the City of San Diego is currently unavailable, SANDAG's regional Survey of Businesses and Employees estimated the percentage of employees able to work from home along with average number of days those employees are able to work from home. Results of this survey, summarized in Table 16, show that the percentage of employees able to partially work from home dropped after the pandemic but are still higher than pre-pandemic levels. Similarly, the number of days nearly worked fully from home doubled from pre-pandemic levels.

TABLE 16: REGIONAL REMOTE WORK SURVEY

Time Era	Pre-Pandemic	During Pandemic	Post-Pandemic
Percentage of SD County Employees Able to Partially Work from Home	25%	54%	44%
Average Number of Days per Week Worked Fully from Home	0.6	1.9	1.2

SANDAG Survey of Businesses and Employees

Measure 3.4: Reduce Traffic Congestion to Improve Air Quality

- 2030 Target: Install 13 new roundabouts
- 2035 Target: Install 20 new roundabouts

The City installed seven roundabouts in 2022, improving vehicle flow and reducing emissions from idling. Additionally, the City retimed 404 traffic signals in 2022 and 60 traffic signals in 2021 that led to traffic flow improvements and subsequent fuel reductions, as shown in Table 17.

TABLE 17: ROUNDABOUTS INSTALLED AND TRAFFIC SIGNALS RETIMED

Year	2016	2017	2018	2019	2020	2021	2022
Roundabouts Installed	2	0	0	0	0	0	7
Traffic Signals Retimed	60	70	52	64	75	60	404

City of San Diego Transportation and Storm Water Department

Measure 3.5: Climate-Focused Land Use

- 2030 Target: 8% VMT (commuter and non-commuter) reduction per capita
- 2035 Target: 15% VMT (commuter and non-commuter) reduction per capita

Measure 3.6: Vehicle Management

- No associated targets

The goals of measures 3.5 and 3.6 are to reduce VMT through land use and parking reform policies. While VMT reductions associated with these specific policies are difficult to track, citywide VMT changes are shown in Table 13 above.

STRATEGY 4: CIRCULAR ECONOMY AND CLEAN COMMUNITIES

Baseline and Current State of Waste and Wastewater in the City of San Diego

The 2015–2022 waste disposed and diversion rates in the City are shown in Table 18. The waste disposed and diversion rates in recent year has remained relatively consistent.

TABLE 18: WASTE DIVERSION RATE AND DISPOSED TONNAGE

Year	2015	2016	2017	2018	2019	2020	2021	2022
Waste Disposed in Landfills (tons)	1,583,833	1,521,363	1,576,105	1,639,817	1,569,447	1,543,627	1,543,627	1,543,627
Waste Diversion Rate	64%	66%	66%	65%	66%	67%	67%	67%

Tonnages were adjusted or corrected from tonnages reported in the CalRecycle database based on City information
City of San Diego Environmental Service Department

The 2015–2022 wastewater flow and associated emissions are shown in Table 19. In 2022, there was a sharp decrease in emissions associated with wastewater treatment. This is because the on-site generation facilities, power plants using landfill gas, at the North City Water Reclamation Plant were decommissioned that year.

TABLE 19: WASTEWATER FLOW AND EMISSIONS [2016-2022]

Year	2016	2017	2018	2019	2020	2021	2022
Wastewater (million gallons)	36,719	37,632	36,391	38,241	38,192	37,591	36,865
GHG Emissions (MT CO2e)	21,257	20,888	20,096	25,612	23,018	23,689	12,585
% Emissions Reduction from Baseline	-	-2%	-5%	20%	8%	11%	-41%

City of San Diego Public Utilities Department

Target Progress: Waste and Wastewater

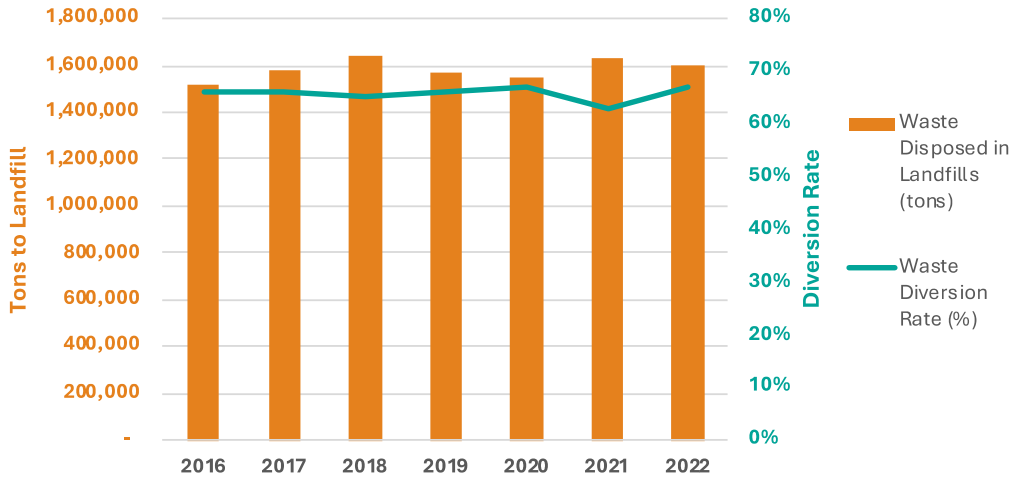
Measure 4.1: Changes to the Waste Stream

- 2030 Target: 82% Waste Diversion Rate and 85% Landfill Gas Capture
- 2035 Target: 90% Waste Diversion Rate and 90% Landfill Gas Capture

The city's current waste diversion rate has been steady around 67%, as shown in Table 18. The Environmental Services Department completed landfill gas system improvements in 2018 that included additional extraction wells and a new blower system. Additional extraction wells were installed in the West Miramar landfill in 2021. Total quantity of landfill gas collected has increased since 2019 when ownership of the landfill gas rights reverted to the City. Given the complexity in estimating an accurate landfill gas capture rate, an industry-standard landfill gas capture rate of 75%

is assumed and improvements to estimating emissions are being considered for future Annual Reports.

FIGURE 18: TONS TO LANDFILL AND LANDFILL DIVERSION RATE IN CITY OF SAN DIEGO [2016–2022]



City of San Diego Environmental Services Department

Measure 4.2: Municipal Waste Reduction

- No defined targets

While waste from city facilities has not been tracked in previous years, progress toward this goal will be tracked in future Annual Reports.

Measure 4.3: Local Food Systems and Food Recovery

- No defined targets

While improving local food systems and food recovery will have impacts on waste and organics sent to landfill, data is currently not available to track such efforts.

Measure 4.4: Zero Waste to Landfill

- No defined targets

As shown in **Error! Reference source not found.** below, the tons sent to landfill by the City of San Diego and waste diversion rate has remained relatively steady from 2016–2022.

Measure 4.5: Capture Methane from Wastewater Treatment Facilities

- 2030 Target: 95% Methane Capture
- 2035 Target: 95% Methane Capture

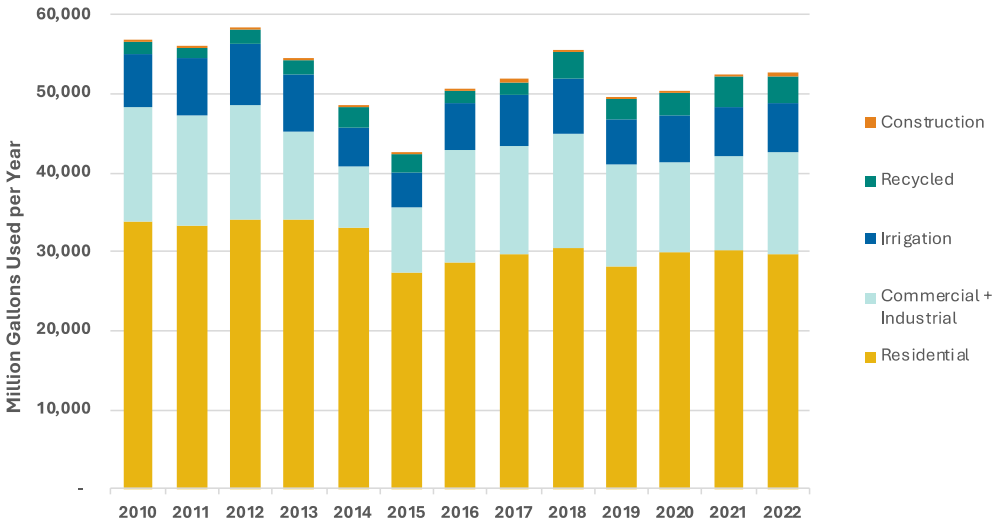
The City of San Diego's Point Loma Wastewater Treatment Plant (Point Loma WWTP) is energy self-sufficient with on-site renewable electricity production using biogas (captured methane from wastewater treatment) and hydropower. The excess renewable electricity generated at the Point Loma WWTP is exported to the grid. The digester capture rate at Point Loma WWTP is now 99.9%.

STRATEGY 5: RESILIENT INFRASTRUCTURE AND HEALTHY ECOSYSTEMS

Baseline and Current State of Water Use in the City of San Diego

Emissions from water consumption are currently 4% of the City of San Diego's total emissions (including water and wastewater). The breakdown of the City of San Diego's water sales by sector including recycled water is given in Figure 19. While overall water use has fluctuated over time, it has been steadily increasing since 2019.

FIGURE 19: WATER SALES BY SECTOR [2010–2022]



Sales withing City of San Diego only. Does not include sales to other agencies.
City of San Diego Public Utilities Department

Target Progress: Trees and Water Systems

Measure 5.1: Sequestration

- 2030 Target: Restore 350 acres of salt marsh land and other associated tidal wetland and riparian habitats
- 2035 Target: Restore 700 acres of salt marsh land and other associated tidal wetland and riparian habitats

The City has restored 56 acres of wetland prior to 2022. Table 21 shows new projects that are currently underway along with the phase of the project they are in. In future Annual Reports, this table will be updated with acres of completed projects.

TABLE 20: ACRES OF RIPARIAN AND WETLAND RESTORATION IN PROGRESS

Ecosystem Type	Design, Permitting, Contracting	Restoration Implementation	Long Term Maintenance
Fresh and Saltwater Marsh	4.1	0.0	0.0
Riparian	0.0	0.0	96.1
Other / Unspecified	78.3	1.2	17.0
Fresh and Saltwater Marsh	4.1	0.0	0.0

City of San Diego Public Utilities Department

Measure 5.2: Tree Canopy

- 2030 Target: 28% urban canopy cover
- 2035 Target: 35% urban canopy cover

The City of San Diego has established a target to increase urban tree canopy from the 2019 baseline[4] of 13% total coverage to 28% by 2030 and 35% by 2035. Increasing urban tree canopy contributes to the capture and storage of carbon, as well as other benefits including storm water management, improved air quality and increased property values. Table 21 shows tree planting and maintenance trends from 2020 to 2022. Progress on maintaining existing trees has shown a sharp increase from 2021 to 2022.

TABLE 21: TREE PLANTING AND MAINTENANCE

Tree Planting and Maintenance Year	2020	2021	2022
Trees Planted[1]	1,863	1,707	1,649
Trees Trimmed[2]	33,254	35,206	61,665
Trees Removed[1]	1,824	2,151	2,004
Trees Evaluated[3]	5,316	6,372	5,569

1.Planted or removed by the Transportation Street Division and Parks and Recreation Department
2.Includes shade trees and palms trees
3.Trees are evaluated for species type, tree condition, diameter, and defects to determine the amount of corrective tree work that may be needed for the health of the tree and/or to address public safety adjacent to the tree.
City of San Diego Transportation and Storm Water Department

Measure 5.3: Local Water Supply

- 2030 Target Provide 33,000 acre-feet local water supply from PureWater
- 2035 Target Provide 93,000 acre-feet local water supply from PureWater

The PureWater project is still under construction, therefore no data is available to report at this time. However, other local water supply versus total water supply has been fluctuating in recent years as shown in

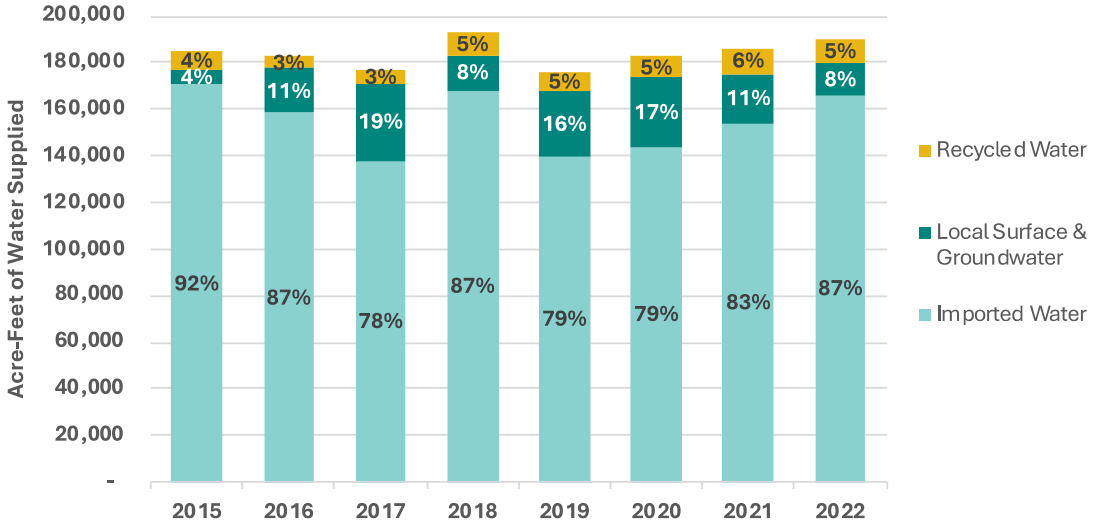
Figure 20. The current availability of local water generally depends on rainfall and runoff in the City reservoirs in the year. In 2019, 17% of total water supply was from local surface and groundwater; while in 2022 8% was from local supply. A higher percentage of local water supply reduces the need to import water from San Diego County Water Authority and the energy and GHG emissions associated

4. The updated urban tree canopy coverage for the 2015-2019 period was 13% in the City of San Diego, based on the Urban Tree Canopy Assessment preliminary results developed by the University of Vermont and the USDA Forest Service, funded by California Department of Forestry and the Fire Protection (CalFire) for the City of San Diego.

with imported water. The total acre-feet of water delivered to the City of San Diego according to source (local, imported and recycled) is shown in

Figure 20 below.

FIGURE 20: ACRE-FEET OF WATER DELIVERED TO CITY OF SAN DIEGO [2015–2022]



City of San Diego Public Utilities Department

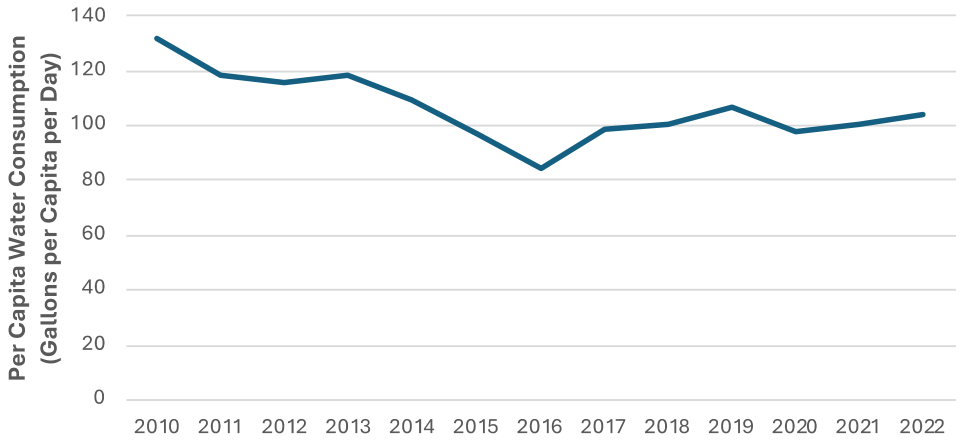
Supporting Actions: Reduce Daily per Capita Water Consumption

Per capita water use, measured in gallons per capita per day (GPCD), decreased from 2010 to 2022 (

Figure 21). Gov. Jerry Brown issued Executive Order B-29-2015 imposing a 25% statewide potable water reduction in April 2015. This drought emergency declaration was lifted by the Governor in April 2017, while retaining a prohibition on wasteful practice. The per capita water use in the City of San Diego has been increasing since the 2015 Executive Order.

The GPCD calculation method (volume of water entering City of San Diego's distribution system divided by distribution system population) is consistent with the GPCD definition in SB X7-7 (the Water Conservation Act of 2009) and the City of San Diego 2015 Urban Water Management Plan (June 2016 final version). However, to be consistent with the CAP, the GPCD is reported by calendar year in this CAP Annual Report, while the GPCD in the Urban Water Management Plan and SB X7-7 are by fiscal year. Therefore, the GPCD reported here cannot be directly compared with the SB X7-7 GPCD target for 2020.

FIGURE 21: PER CAPITA WATER USE [2010–2022]



City of San Diego Public Utilities Department, Energy Policy Initiatives Center, University of San Diego 2024

The amount of recycled water and water used for irrigation from 2019 to 2022 is provided in Table 22. Both recycled and metered irrigation water have been steadily increasing since 2019.

TABLE 22: METERED RECYCLED AND IRRIGATION WATER USE

Year	Recycled Water Sales (million gallons)	Metered Irrigation Water Use (million gallons)
2019	2,606	5,631
2020	2,881	5,988
2021	3,688	6,298
2022	3,263	6,217

Metered irrigation water, including agricultural and landscape water use.

2021 data updated from previous Annual Report to reflect most up-to-date primary data.

City of San Diego Public Utilities Department

STRATEGY 6: EMERGING CLIMATE ACTION

- 2030 Target: Residual Emissions 391,000 additional reduction needed to reach fair-share target
- 2035 Target: Residual Emissions 2,262,000 additional reduction/removal needed to reach carbon neutrality

Measure 6.1: Explore Further Opportunities to Achieve Net Zero GHG Emissions

As the City of San Diego assesses and plans future climate action, updates will be provided in future reports and on the City's online CAP Dashboard.

Section C: Methodology Differences and Data Refinement

The method differences and data refinements between the previous and current GHG inventory calculations are given in Table 23. The differences are primarily from updated and more accurate data sources. "No change" means no method differences or data refinements since the 2020 Annual Report, or the 2022 CAP.

Table 23: METHODOLOGY DIFFERENCES AND DATA REFINEMENTS OF GHG INVENTORY

Category	Category Detail	2019 Inventory (Used for 2022 CAP)	2019–2022 Inventory (This Annual Report)
Electricity	Activity (kWh)	Requested data from SDG&E by customer class, service provider, and rate schedule for customers with City of San Diego town code	2019–2020: No change 2021: Data requested from SDG&E by customer class within City of San Diego town code. No service provider or rate schedule available. Direct access and San Diego Community Power customer electricity use were estimated. 2022: Data requested from SDG&E by customer class within City of San Diego town code. No service provider or rate schedule available. Direct access customer electricity use was estimated based on previous year's data. SDCP consumption data provided.

Table 23: METHODOLOGY DIFFERENCES AND DATA REFINEMENTS OF GHG INVENTORY			
Category	**Category Detail**	**2019 Inventory (Used for 2022 CAP)**	**2019–2022 Inventory (This Annual Report)**
	Emission Factor (lbs CO2e/MWh)	Created a weighted average emission factor based on a) SDG&E kWh procured from each fuel type at each facility/power plant and the emission factor of electricity generation at each facility/power plant (EPA eGRID2019 database specific plant level emission factor) for SDG&E's purchased power.	2020-2022: Used the SDG&E and San Diego Community Power emission factors reported under CEC's power source disclosure program.
Natural Gas	Activity (Therms)	Requested data from SDG&E by customer class, service provider, and rate schedule for customers with City of San Diego town code	2020: No change 2021: Data requested from SDG&E by customer class within City of San Diego town code. No service provider or rate schedule available.
	Emission Factor (MT CO2e / Therm)	Natural gas emission factor in California based on California Air Resources Board statewide inventory	No change
Transportation	Activity (VMT)	Applied annual average VMT rate of increase from 2016-2019 HPMS data to 2016 VMT estimates. 2016 VMT estimates were provided by SANDAG using Series 14 Forecast and ABM2+ from the Draft 2021 Regional Plan	2020: Applied annual average VMT rate of increase from 2016–2019 HPMS data to 2016 VMT estimates provided by SANDAG using Series 14 Forecast and ABM2+ from the Final 2021 Regional Plan 2021: Applied the VMT 2019 to 2021 percent increase from PeMS data to 2019 VMT estimates, due to a delay in HPMS data

Table 23: METHODOLOGY DIFFERENCES AND DATA REFINEMENTS OF GHG INVENTORY			
Category	**Category Detail**	**2019 Inventory (Used for 2022 CAP)**	**2019–2022 Inventory (This Annual Report)**
			2022: Applied HPMS data to 2016 VMT estimates to years 2021 and 2022
	Emission Factor (g CO2e/mile)	San Diego region emission rate per vehicle class from EMFAC2021 with model default assumptions on vehicle mix, travel activities, etc.	No change
Water	Activity (acre-feet)	Potable and recycled water supplied to City of San Diego (water production) separated into wholesale water (from San Diego County Water Authority) and local water (surface and groundwater) Removed water purchased by Del Mar and CalAm service area not in the City	No change
	Emission Factor (energy intensity - kWh/acre-foot)	Local energy intensity based on water treatment plants and lake pump stations electricity consumption, all other water pump stations and facilities electricity consumption Upstream supply energy intensity calculated based on Metropolitan Water District and SDCWA 2015 Urban Water Management Plan	No change

Table 23: METHODOLOGY DIFFERENCES AND DATA REFINEMENTS OF GHG INVENTORY			
Category	**Category Detail**	**2019 Inventory (Used for 2022 CAP)**	**2019–2022 Inventory (This Annual Report)**
	Electricity Emission Factor (lbs CO2e/MWh)	Upstream: eGRID 2016	2019: eGRID2019 2020: eGRID2020 2021: eGRID2021 2022: eGRID2022
Wastewater	Activity (gallons)	City of San Diego's annual average flow (MGD) entering into Metropolitan Sewerage System (include Point Loma WWTP, South Bay WRP and North City WRP)	No change
	Emission Factor (MT CO_2/gallon)	Calculated by dividing Point Loma WWTP and North City WRP GHG Emission reported in CARB Mandatory GHG Reporting by 2015 Point Loma WWTP and North City WRP total flow	No change
Solid Waste	Activity (tons)	Annual waste disposed tonnage provided by City of San Diego Environmental Services Department	2019–2020: No change 2021: Used 2020 waste tonnage due to a delay in reported data 2022: Updated 2021 waste tonnage with City's primary data. No other change
	Emission Factor (MT CH4/tons)	Emission factor for each waste component from EPA WARM Model Version 15 (2019 version) and waste components from City of San Diego waste characterization study 2012–2013	No change