CITY OF LOS ANGELES
2020 COMMUNITY GREENHOUSE GAS INVENTORY

April 2022

LA Sanitation & Environment
Regulatory Affairs Division

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Executive Summary

As of 2020, Los Angeles has reduced community-wide greenhouse gas (GHG) emissions by 36% since 1990. Los Angeles is on the path to reaching our interim targets of a 50% reduction by 2025 and a 73% reduction by 2035. Ultimately, Los Angeles has set the ambitious goal to reach carbon neutral by 2050.

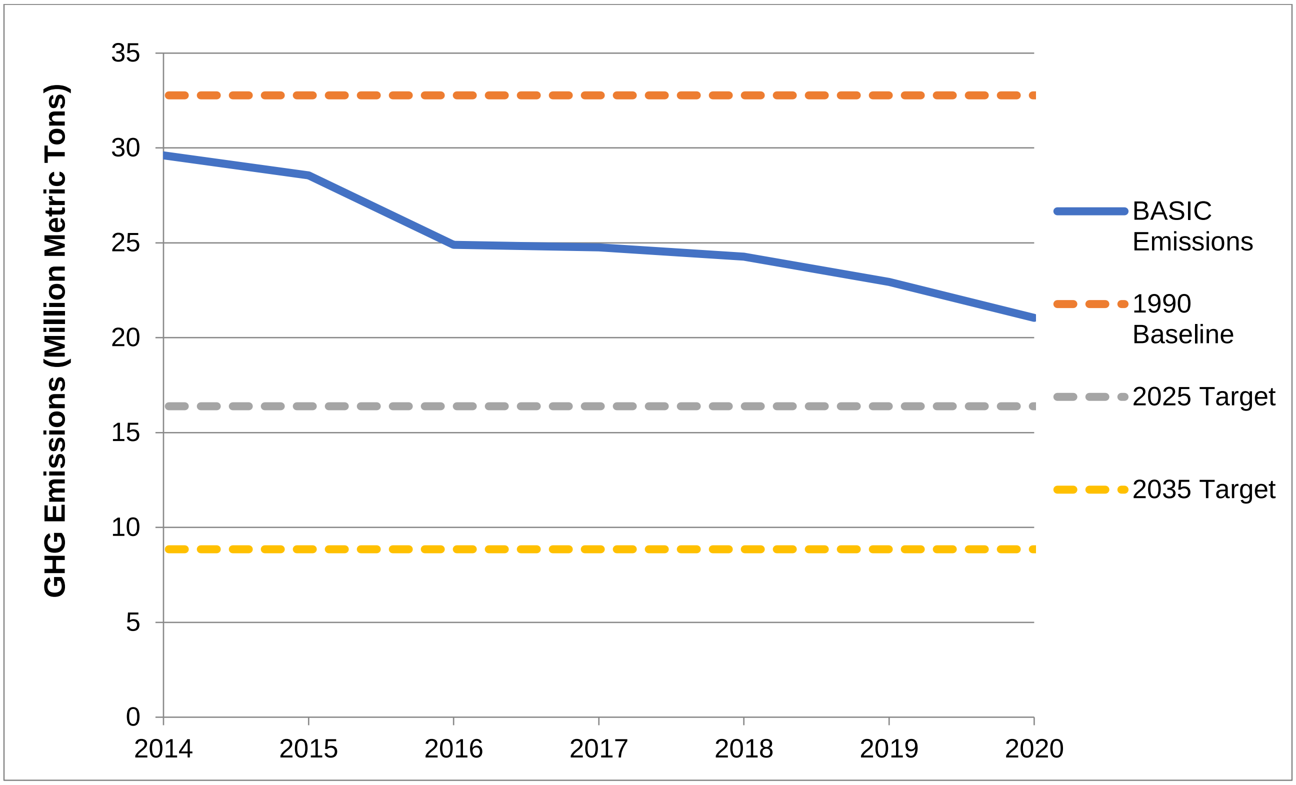


Figure 1. Emissions Progress Compared to Targets

Los Angeles' community-wide GHG inventory includes emissions from sources within the stationary energy, transportation, and solid waste sectors. In 2020, community-wide GHG emissions were 21.1 million metric tons carbon dioxide equivalent (MMT CO_2e). The COVID-19 pandemic likely impacted 2020 emissions reduction and Section 5 contains additional discussion regarding the potential pandemic impacts on the inventory.

Table 1. Emissions by Sector (Million Metric Tons CO_2e)

	1990	2014	2015	2016	2017	2018	2019	2020	1990 vs 2020 Percent Change
Stationary Energy	26.0	23.8	23.1	19.6	19.6	19.1	17.7	16.8	**- 35%**
Transportation	5.6	4.7	4.3	4.1	3.9	3.9	3.9	3.0	**- 47%**
Waste	1.2	1.1	1.2	1.2	1.3	1.3	1.3	1.3	**12%**
Total Emissions	32.8	29.6	28.6	24.9	24.8	24.3	22.9	21.1	**- 36%**

In 2020, Los Angeles' GHG emissions per capita has dropped to 5.4 MT CO_2e per capita which is below the national average, 12.98[1].

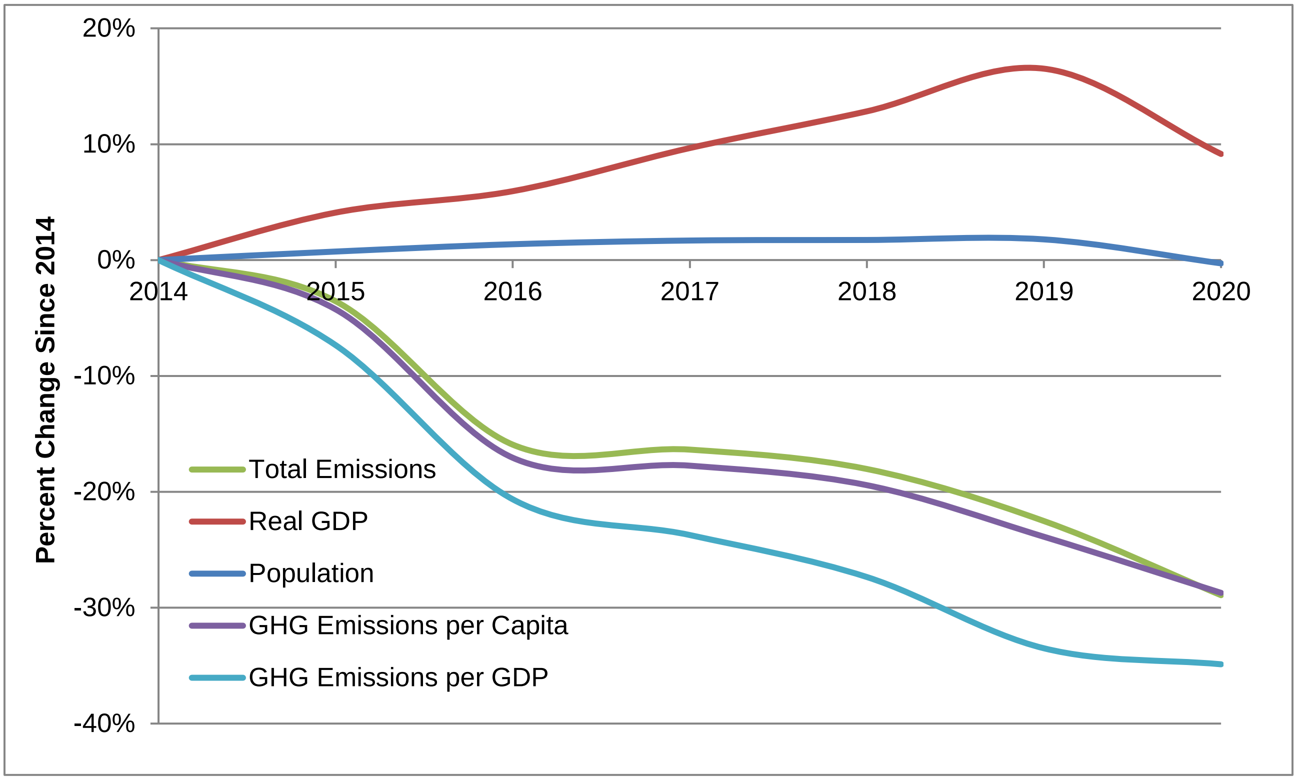


Figure 2. Emissions Trends and Metrics

[1] International Energy Agency, https://www.iea.org/data-and-statistics/charts/co2-emissions-per-capita-in-selected-countries-and-regions-2000-2020.

1. Introduction

Climate change is a global issue that demands local action, and the City of Los Angeles is taking aggressive measures to reduce greenhouse gas (GHG) emissions and combat further climate impacts. As the lead agency for the City's environmental programs and initiatives, LA Sanitation and Environment (LASAN) is a critical partner in Los Angeles' fight against climate change. LASAN believes that effective climate action requires a concrete understanding of Los Angeles' GHG emissions, drivers, and trends to inform a dynamic and data-driven response to climate change. LASAN's annual, comprehensive community GHG inventories are an essential component to developing that understanding. They also serve as metrics to measure progress toward the City's ambitious climate goals.

In 2019, LASAN was tasked by the Mayor's Office of Sustainability (MOS) with preparing the City of Los Angeles' annual community greenhouse gas (GHG) inventories. At that time, LASAN also upgraded all previously prepared GHG inventories from the BASIC to the BASIC+ rating. Previously, only a BASIC inventory was prepared due to a lack of data sources for the areas required for BASIC+.

In April 2021, LASAN published its first public report for Los Angeles' 2018 Community GHG Inventory. This work was used in L.A.'s Green New Deal 2020-2021 Annual Report to update the City's progress towards its' GHG targets.

To date, LASAN has community-wide inventories for calendar years 2014-2020 and 1990, which serves as the baseline. 1990 was established as the community baseline in the City's Sustainable City pLAn. All reduction percentages cited in this report use the 1990 GHG inventory as the baseline. This report will focus on summarizing the emissions for Los Angeles' 2020 Community GHG Inventory while also providing emissions trends over time.

2. Methodology

LASAN prepares the City's GHG inventory using C40's Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC), which is a widely recognized guidance document. The GPC outlines two complementary approaches: the scopes framework and city-induced framework since City activities generating emissions can occur inside or outside the city boundary. This inventory estimates emissions of five GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). Each GHG has a global warming potential (GWP), which is the ratio of its heat-trapping ability relative to that of CO_2. Using their GWPs, emissions of each GHG are converted to units of CO_2 equivalents (CO_2e) in this report to allow for a consistent comparison.

Table 2. Greenhouse Gas Global Warming Potential Factors

Greenhouse Gas	Formula	GWP*
Carbon Dioxide	CO_2	1
Methane	CH_4	25
Nitrous Oxide	N_2O	298
Hydrofluorocarbons	HFCs	124-14,800
Perfluorocarbons	PFCs	7,390-12,200
*100- year time horizon.		

This inventory utilizes IPCC's AR4 GWP values to stay consistent with California Air Resources Board's (CARB) annual statewide California Greenhouse Gas Emissions Inventory. This report only presents emissions as MT CO_2e.

2.1 Scopes

Scope 1 emissions are from sources located within the city boundary (in-boundary activities). These can also be considered "territorial" emissions because they are all produced within the geographic boundary. Scope 2 emissions occur from the use of grid-supplied electricity, heat, steam, and/or cooling within the city boundary. Scope 3 emissions are from sources outside the city boundary as a result of actions occurring within the city boundary (out-of-boundary activities).

2.2 BASIC vs BASIC+

The GPC outlines two reporting levels, BASIC and BASIC+. BASIC covers Scope 1 and 2 emissions from the stationary energy and transportation sectors, and Scope 1 and 3 emissions from the waste sector. BASIC+ is more comprehensive and includes all emissions under BASIC reporting as well as two additional sectors, industrial processes and product use (IPPU) and agriculture, forestry, and other land use (AFOLU), and Scope 3 emissions from stationary energy and transportation sectors. While BASIC+ reporting provides a more holistic view of the City's GHG emissions, the City has little direct influence or control over these additional sources. This report discusses all five sectors under BASIC+ but only BASIC emissions are used to track progress toward the goals and targets outlined in L.A.'s Green New Deal.

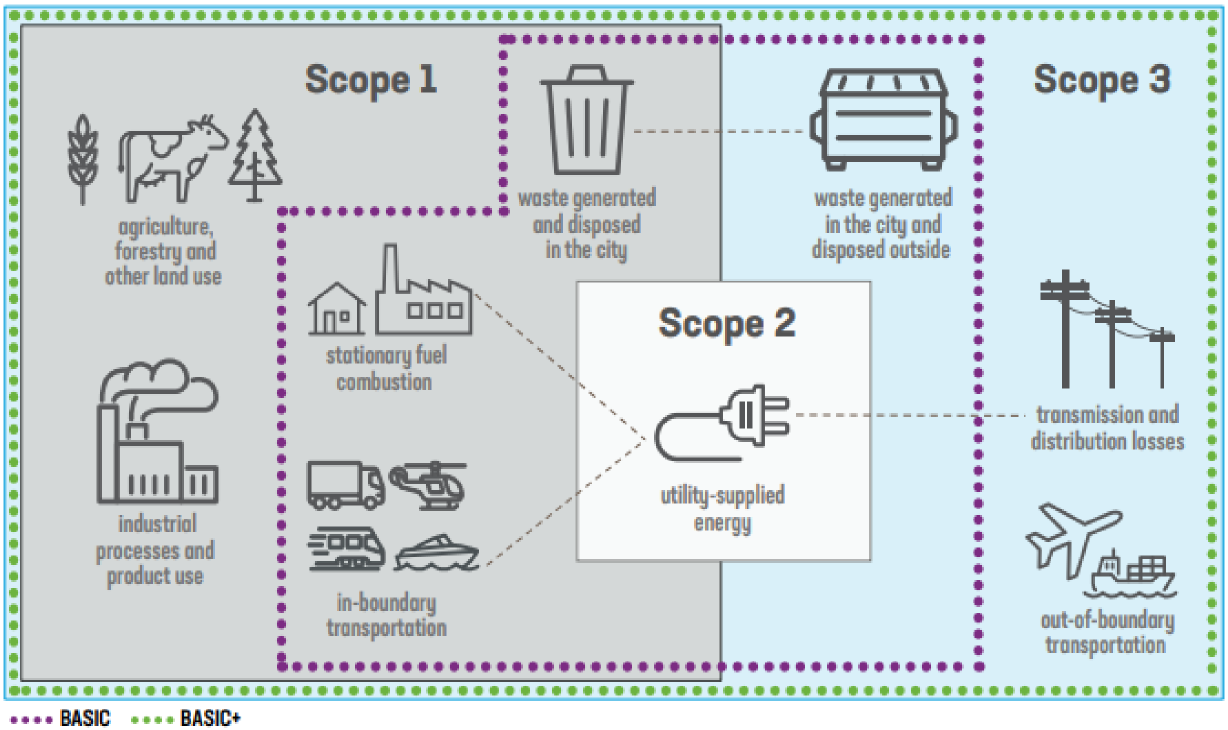


Figure 3. Sources Included in BASIC and BASIC+

2.3 Data Collection and Providers

Through cooperation and collaboration with a variety of departments and agencies, LASAN has established a data collection process for preparation of the annual inventories. A table summarizing the data providers is provided below.

Table 3. Community GHG Inventory Data Providers

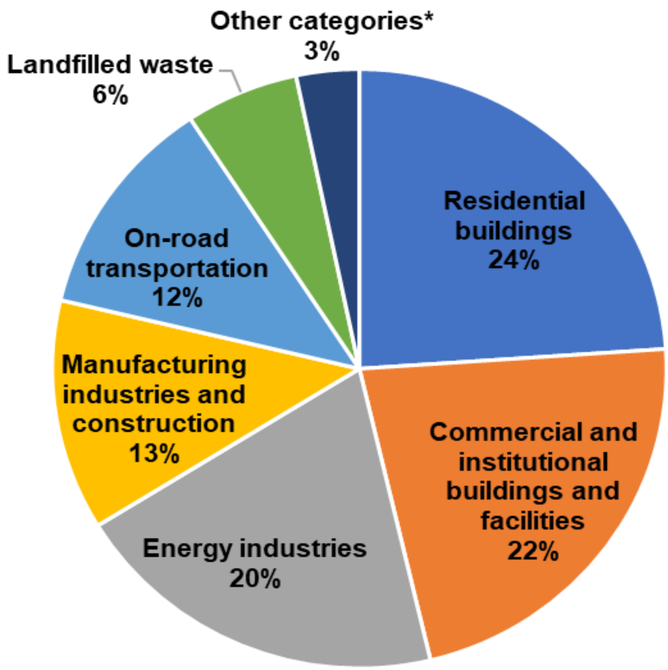
Data Provider	Data
City Department	
LASAN	Solid waste characterization; compost tonnage; biosolids; wastewater treatment
LADWP	Residential, commercial, institutional, and industrial electricity consumption; transmission and distribution losses; water services-related electricity consumption, power generation fuel consumption, EV charging electricity consumption
LAWA	Commercial jet fuel usage
POLA	Local harborcraft fuel usage
LA Animal Services Department	Livestock estimates
Regulatory Agency	
CARB	EMFAC2021 Model for vehicle fuel efficiency; off-road transportation emissions estimate; fuel estimate for vessel bunkering; industrial facilities involved with mineral, chemical, or metal production; ODS usage
South Coast Air Quality Management District (SCAQMD)	Industrial fuel consumption, landfill flaring
EPA	Refinery feed flaring; industrial facilities involved with mineral, chemical, or metal production
California Geologic Energy Management (CalGEM)	Oil and gas wells
FAA	Local aircraft fuel usage
CalRecycle	Solid waste disposal tonnage
CDFA	Fertilizer usage
Other	
Energy Information Administration (EIA)	Residential, commercial, and industrial wood and ethanol consumption
SoCal Gas	Residential, commercial, and industrial natural gas consumption
SCE	Utility's electricity emission factor
Southern California Association of Governments (SCAG)	On-road VMT analysis
Amtrak	Annual trips estimate
Metrolink	Annual trips estimate
BNSF Railway	Fuel usage
Union Pacific	Fuel usage
LA Metro	Rail propulsion electricity usage
ICLEI	Land use change emissions estimate

3. Findings by Sector

The sections below present findings from the City's 2014-2020 community inventories. Every year, LASAN continues to update the community GHG inventory to incorporate new procedures, as well as make improvements to data collection processes, methodologies, emissions factors, and quality assurance. Inventories from previous years are updated and revised to reflect these changes and to maintain a consistent time-series following recommendations from the Intergovernmental Panel on Climate Change (IPCC) for developing GHG inventories.

The City's overall emissions continue to decline but with the COVID-19 pandemic impacting all aspects of life within the City of Los Angeles, the 2020 community GHG inventory had major changes in the City's subsector emissions trends. For example, the Los Angeles' "Safer At Home" order caused an unusually large decline in the on-road transportation subsector and may have caused a stationary energy sector shift from the commercial to residential subsector. These effects should be considered when interpreting the emissions data and Section 5 provides additional context about the pandemic's impact on the inventory. Overall, this data can be one way to understand how this pandemic changed the way Angelenos live, work, and connect.

The largest sector in Los Angeles' community GHG inventory is the stationary energy sector since it contains the four highest subsectors. The stationary energy sector was the largest contributor, but also had the largest emissions reduction. This was primarily driven by decarbonization of the electricity grid. The largest overall subsectors are residential buildings, closely followed by commercial and institutional buildings and facilities and energy industries.



*Other categories include off-road transportation, fugitive emissions from oil and natural gas systems, railways, waterborne navigation, wastewater, aviation, biological waste, and incineration.

Figure 4. 2020 BASIC Emissions by Subsector

3.1 Stationary Energy

The stationary energy sector includes fuel combustion and fugitive emissions that occur while generating, delivering, and consuming useful forms of energy (such as electricity or heat). The five main subsectors are residential buildings, commercial and institutional buildings and facilities, manufacturing industries and construction, energy industries, and fugitive emissions from oil and natural gas systems.

Table 4. BASIC Stationary Energy Emissions by Subsector (MT CO_2e)

	Residential buildings	Commercial and institutional buildings and facilities	Manufacturing industries and construction	Energy industries	Fugitive emissions from oil and natural gas systems	Total Stationary Energy Emissions
1990	7,190,000	9,900,000	4,300,000	4,150,000	437,000	25,977,000
2014	6,590,000	8,460,000	4,000,000	4,590,000	215,000	23,855,000
2015	6,540,000	8,220,000	3,920,000	4,160,000	213,000	23,053,000
2016	5,390,000	6,230,000	3,450,000	4,290,000	217,000	19,577,000
2017	5,210,000	5,890,000	3,820,000	4,440,000	216,000	19,576,000
2018	5,100,000	5,900,000	3,320,000	4,490,000	217,000	19,027,000
2019	5,020,000	5,540,000	2,720,000	4,230,000	216,000	17,726,000
2020	5,040,000	4,700,000	2,620,000	4,200,000	212,000	16,772,000

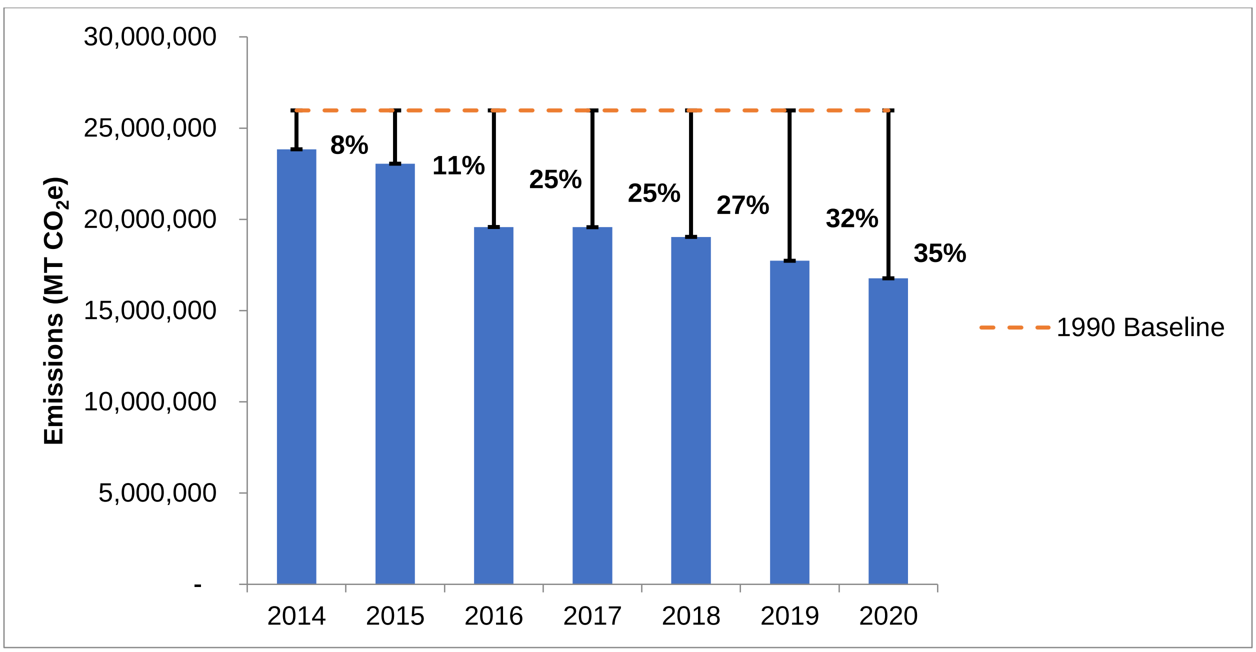


Figure 5. BASIC Stationary Energy Sector Emissions Reductions from Baseline

Overall emissions in this sector have decreased 35% since 1990. Emissions reductions are primarily driven by decarbonization of the electricity grid. Between 2014 and 2020, the carbon emissions intensity of the City's electricity has decreased by 46%. The largest emissions drop occurred from 2015 to 2016, when the Los Angeles Department of Water and Power (LADWP) significantly reduced its coal-fired power by fully divesting from Navajo Generating Station. This decarbonization trend will continue as LADWP works towards supplying 100% renewable energy by 2035 as outlined in the Los Angeles 100% Renewable Energy Study (LA100). From 2019 to 2020, LADWP has increased the renewable energy content from 34.1% to 36.7%.[2] Further reductions in this sector will have to come from building electrification, energy efficiency, and reducing fuel combustion at industrial facilities.

The additional stationary energy emissions included in BASIC+ are primarily from electricity transmission and distribution losses.

Table 5. BASIC+ Stationary Energy Emissions by Subsector (MT CO_2e)

	Residential buildings	Commercial and institutional buildings and facilities	Manufacturing industries and construction	Energy industries	Fugitive emissions from oil and natural gas systems	Total Stationary Energy Emissions
1990	7,640,000	11,110,000	4,510,000	4,150,000	437,000	27,847,000
2014	7,200,000	9,660,000	4,130,000	4,590,000	215,000	25,795,000
2015	7,100,000	9,310,000	4,030,000	4,160,000	213,000	24,813,000
2016	5,770,000	6,970,000	3,520,000	4,290,000	217,000	20,767,000
2017	5,560,000	6,480,000	3,890,000	4,440,000	216,000	20,586,000
2018	5,430,000	6,560,000	3,380,000	4,490,000	217,000	20,077,000
2019	5,320,000	6,080,000	2,770,000	4,230,000	216,000	18,616,000
2020	5,330,000	5,260,000	2,660,000	4,200,000	212,000	17,662,000

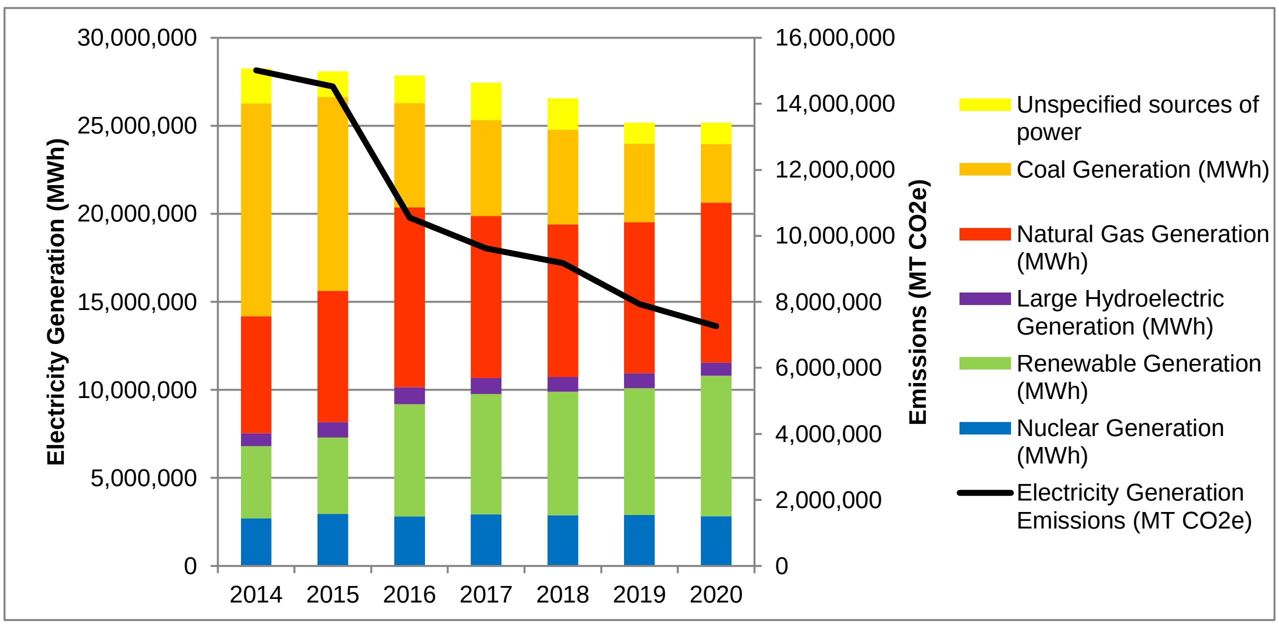


Figure 6. Electricity Generation Portfolio vs Emissions

[2] https://www.energy.ca.gov/programs-and-topics/programs/power-source-disclosure/power-content-label

3.2 Transportation

The transportation sector includes GHG emissions from fuel combustion and electricity used for transportation activities. The sector covers five subsectors: on-road transportation, railways, waterborne navigation, aviation, and off-road transportation.

Table 6. BASIC Transportation Emissions by Subsector (MT CO_2e)

	On-road transportation	Railways	Waterborne navigation	Aviation	Off-road transportation	Total Transportation Emissions
1990	5,390,000	25,000	36,000	12,000	160,000	5,623,000
2014	4,240,000	98,000	56,000	17,000	243,000	4,654,000
2015	3,900,000	99,000	61,000	17,000	248,000	4,325,000
2016	3,680,000	82,000	58,000	15,000	255,000	4,090,000
2017	3,490,000	84,000	62,000	18,000	262,000	3,916,000
2018	3,470,000	85,000	66,000	17,000	269,000	3,907,000
2019	3,440,000	86,000	61,000	16,000	276,000	3,879,000
2020	2,530,000	74,000	61,000	14,000	277,000	2,956,000

Overall emissions in this sector have decreased 47% since 1990. Emissions in this sector are primarily from on-road transportation. 2020 on-road transportation activity was impacted greatly by the pandemic with vehicle miles traveled (VMTs) reduced by an estimated 26%.[3] Decreasing this sector's emissions will require vehicle electrification alongside decarbonization of the electricity grid.

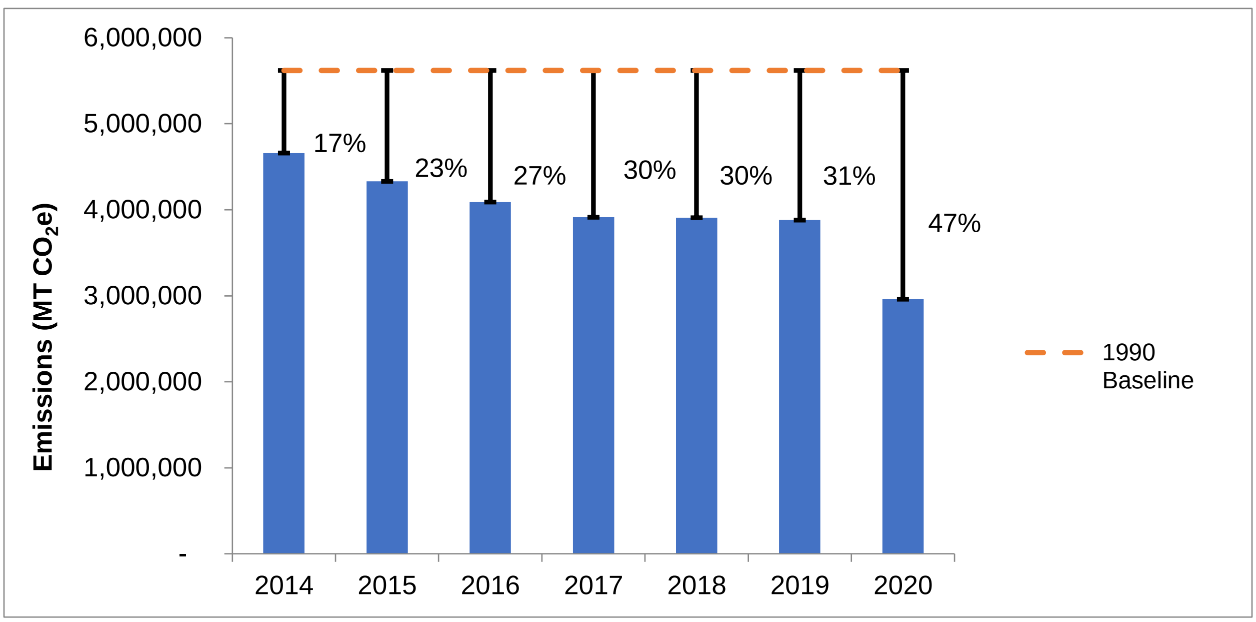


Figure 7. BASIC Transportation Sector Emissions Reductions from Baseline

[3] The COVID-19 pandemic affected 2020 on-road transportation VMT activity. VMT reduction estimates were received from Southern California Association of Governments (SCAG). Therefore, caution should be used when interpreting transportation emissions trends with 2020 values.

BASIC+ transportation emissions are significantly higher because they include commercial cargo ship and flight fuel usage in the waterborne navigation and aviation subsectors, respectively. While these activities are outside the City's regulatory authority, Los Angeles World Airports (LAWA) and Port of Los Angeles (POLA) are implementing initiatives and programs to reduce these emissions. For example, LAWA is working with tenants on sustainable aviation jet fuel usage and POLA is working with oceangoing vessels to use shore-side electricity instead of diesel when at berth.

Table 7. BASIC+ Transportation Emissions by Subsector (MT CO_2e)

	On-road transportation	Railways	Waterborne navigation	Aviation	Off-road transportation	Total Transportation Emissions
1990	5,390,000	74,000	9,540,000	14,430,000	160,000	29,594,000
2014	4,240,000	202,000	2,870,000	15,840,000	243,000	23,395,000
2015	3,900,000	199,000	3,490,000	17,010,000	248,000	24,847,000
2016	3,680,000	182,000	4,480,000	18,320,000	255,000	26,917,000
2017	3,490,000	180,000	5,050,000	19,150,000	262,000	28,132,000
2018	3,480,000	189,000	4,410,000	19,560,000	269,000	27,908,000
2019	3,450,000	197,000	4,720,000	19,400,000	276,000	28,043,000
2020	2,540,000	176,000	4,660,000	11,450,000	277,000	19,103,000

3.3 Waste

The waste sector includes disposal and/or treatment of solid waste and wastewater. Waste disposal and treatment produces emissions through decomposition or incineration.

Table 8. Waste Emissions by Subsector (MT CO_2e) [4]

	Solid waste generated in the city	Biological waste generated in the city	Incinerated and burned waste generated in the city	Wastewater generated in the city	Total Waste Emissions
1990	1,120,000	4,000	11,000	48,000	1,183,000
2014	1,050,000	6,000	15,000	45,000	1,116,000
2015	1,110,000	7,000	13,000	47,000	1,177,000
2016	1,160,000	12,000	16,000	44,000	1,232,000
2017	1,230,000	5,000	4,000	50,000	1,289,000
2018	1,260,000	9,000	3,000	51,000	1,323,000
2019	1,270,000	8,000	2,000	53,000	1,333,000
2020	1,260,000	7,000	3,000	49,000	1,319,000

Solid waste disposal at landfills accounts for over 95% of this sector's emissions. Emissions from this sector have increased compared to the baseline and this can be attributed to population and economic growth, as well as consumer habit shifts toward e-commerce and food delivery. The City's organics recycling efforts, increased producer responsibility policies, and efforts to decrease single-use items is working towards lowering the City's landfill disposal tonnage. Public education and behavioral shifts will also play an important role in lowering disposal.

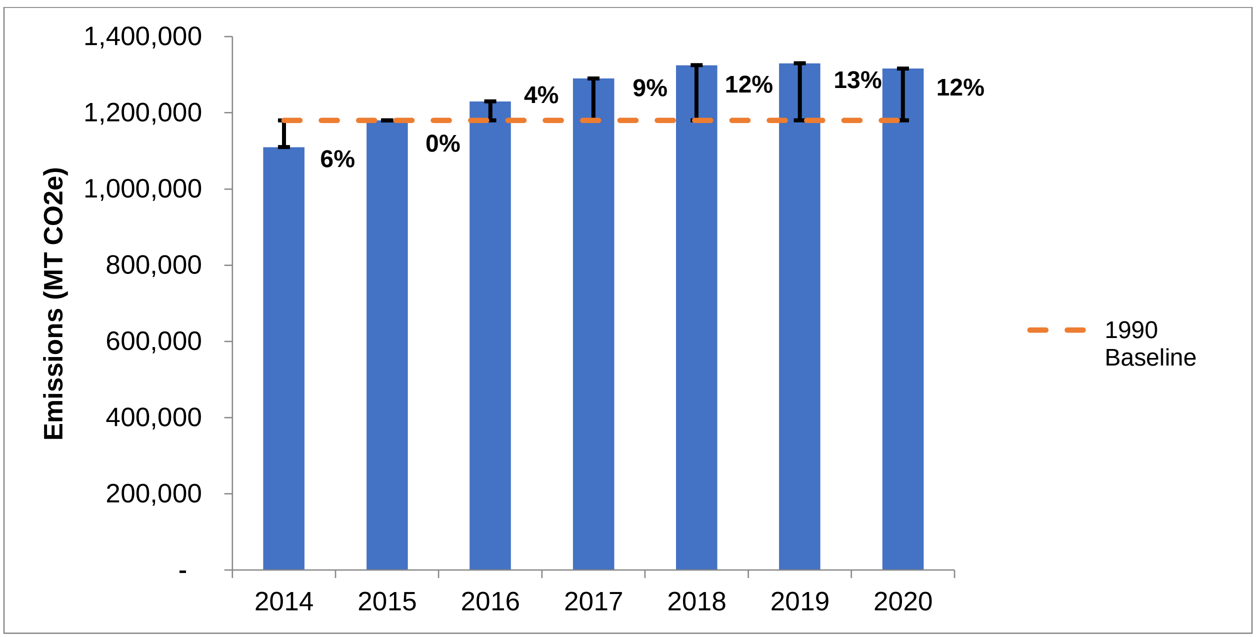
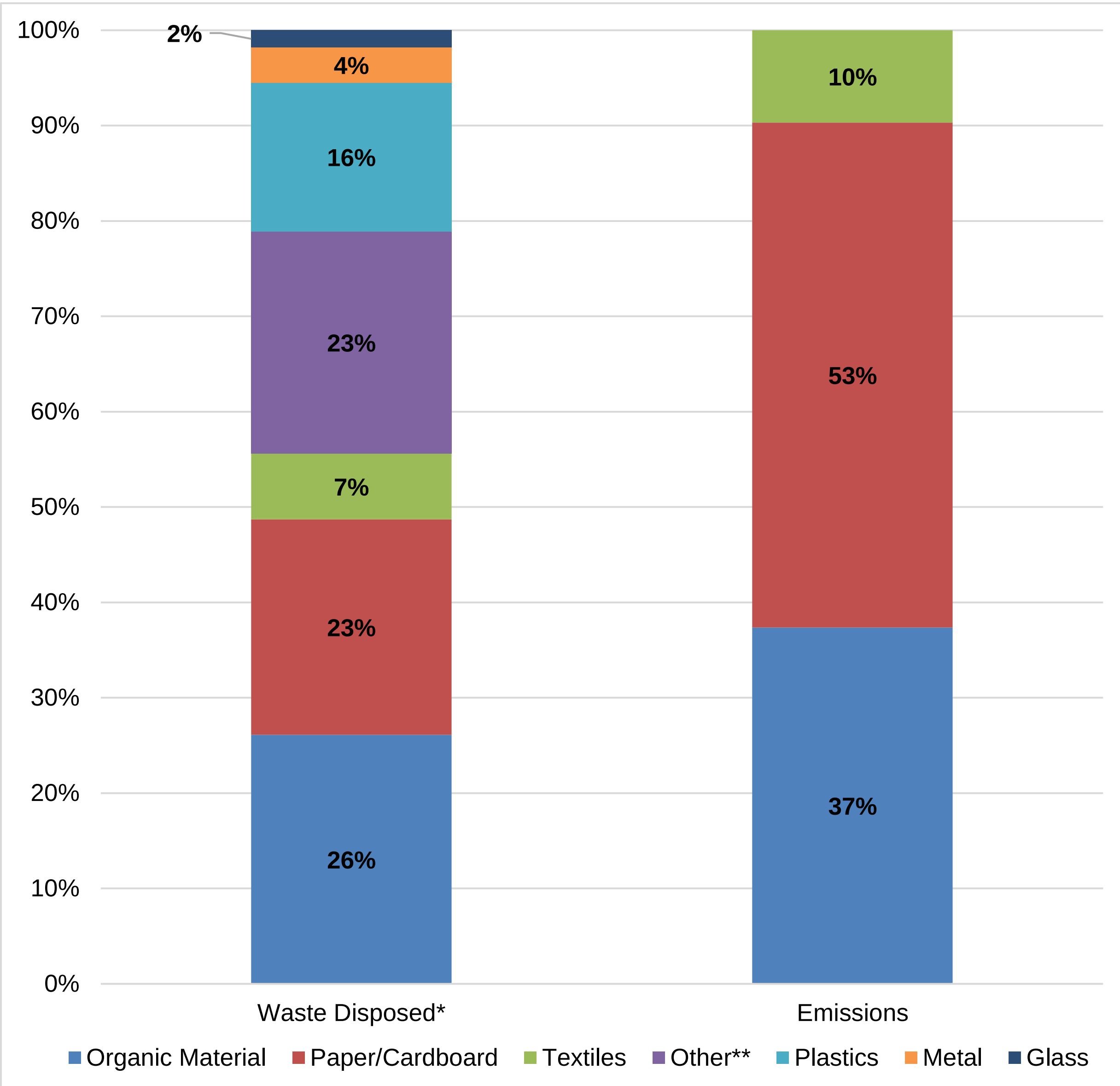


Figure 8. BASIC Waste Sector Emissions Reductions from Baseline

[4] For the waste sector, BASIC and BASIC+ emissions are the same (see Figure 2).

Solid waste emissions are mostly determined by the composition of waste since different types of waste generate different amounts of GHGs based on their degradable organic content (DOC). Paper and cardboard constitute 23% of the City's waste but are the largest contributor of the City's landfilled waste emissions at 53%. Organic waste is the largest waste component at 26% and is the second largest emissions contributor at 37%. Together, these two categories account for 90% of the City's total landfilled waste emissions.



*Percentages may not total to 100 percent due to rounding.
**Other includes rubber and leather, electronics, gypsum board, inert material, household hazardous waste, special waste, and mixed residue.

Figure 9. Landfilled Waste Characterization vs. Emissions

3.4 Agriculture, Forestry, and Other Land Use

The AFOLU sector includes GHG emissions from land-use changes, methane produced in the digestive processes of livestock, and nutrient management for agricultural purposes. AFOLU emissions are only required for BASIC+, and therefore not included in the City's BASIC emissions total. Carbon sequestration is included in the inventories for informational purposes; however, they are not included in net emissions for BASIC+ reporting.

Table 9. AFOLU Emissions by Subsector (MT CO_2e)

		1990	2014	2015	2016	2017	2018	2019	2020
Livestock	Sources	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Land	Sources	14,000	12,000	12,000	12,000	12,000	12,000	11,000	11,000
	Sinks	(112,000)	(113,000)	(113,000)	(113,000)	(113,000)	(113,000)	(113,000)	(113,000)
Aggregate Emission Sources	Sources	15,000	9,000	9,000	6,000	10,000	12,000	53,000	14,000
	Sinks	(49,000)	(67,000)	(67,000)	(64,000)	(48,000)	(53,000)	(63,000)	(56,000)
	Total	**33,000**	**25,000**	**25,000**	**22,000**	**26,000**	**28,000**	**68,000**	**29,000**

AFOLU emissions have remained relatively the same, except for 2019, which is an outlier.[5] The emissions source in this sector is primarily from synthetic fertilizer usage. The City's organic waste recycling program will help contribute to reducing synthetic fertilizer by providing compost as an alternative fertilizer product.

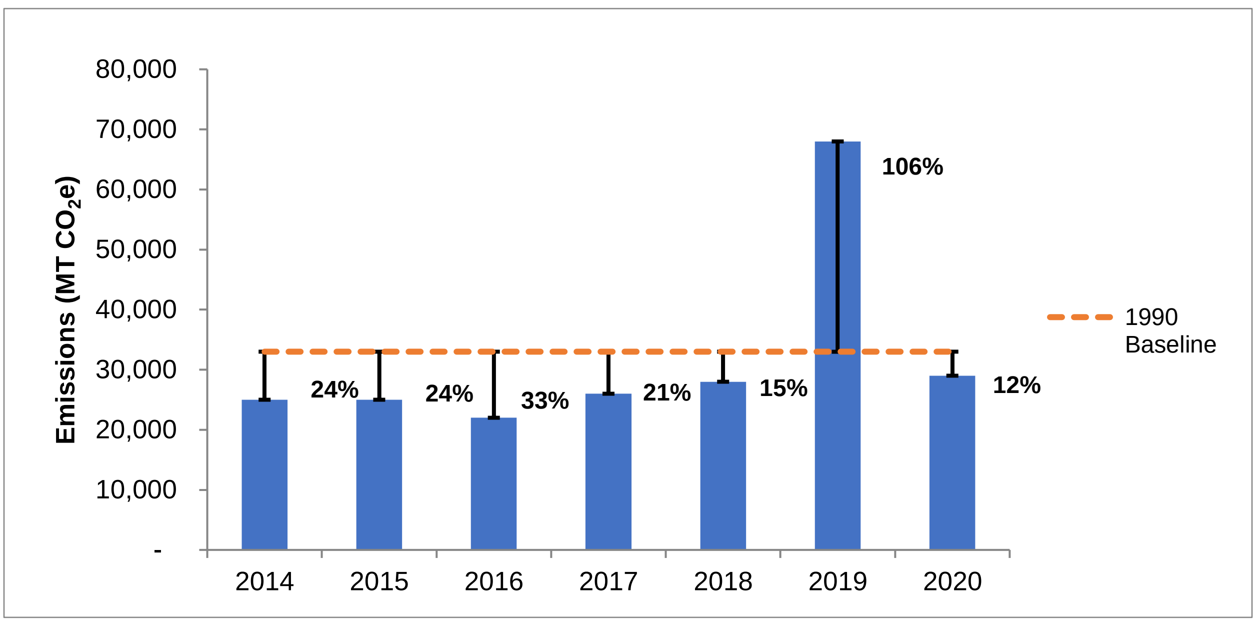


Figure 10. AFOLU Sector Emissions Reductions from Baseline

[5] 2019 emissions increase is from a significant increase in fertilizer usage, as estimated and published by the California Department of Food and Agriculture (CDFA). In communications with CDFA, the agency confirmed the 2019 data.

3.5 Industrial Processes and Product Use

The IPPU sector includes emissions from non-energy related industrial processes[6] and product use. Industrial product use comes from substitutes for ozone-depleting substances (ODS), such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs), which are used in refrigeration and air conditioning equipment, foam production, fire extinguishing, and aerosols. IPPU emissions are only required for the BASIC+ standard and not included in the City's BASIC emissions total.

Table 10. IPPU Emissions by Subsector (MT CO_2e)

	Industrial Processes	Product Use	Total IPPU Emissions
1990	-	10,000	10,000
2014	-	1,770,000	1,770,000
2015	-	1,860,000	1,860,000
2016	-	1,930,000	1,930,000
2017	-	1,990,000	1,990,000
2018	-	2,040,000	2,040,000
2019	-	2,050,000	2,050,000
2020	-	2,020,000	2,020,000

All IPPU emissions come from ODS substitute usage. 92% of this sector's emissions are from HFCs and PFCs usage for refrigeration and air conditioning. To reduce this, the City must implement policies for alternative cooling using technologies like "cool roofs" or "cool pavements". California Air Resources Board (CARB) is also working on state regulation to require HFC alternatives with lower global warming potential.

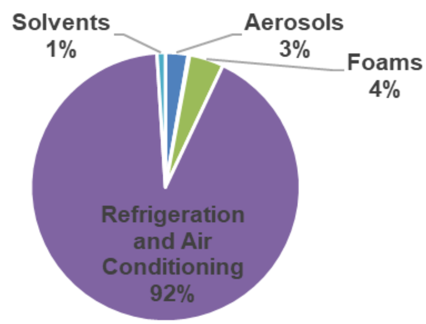


Figure 11. ODS Substitute Usage by Source Category

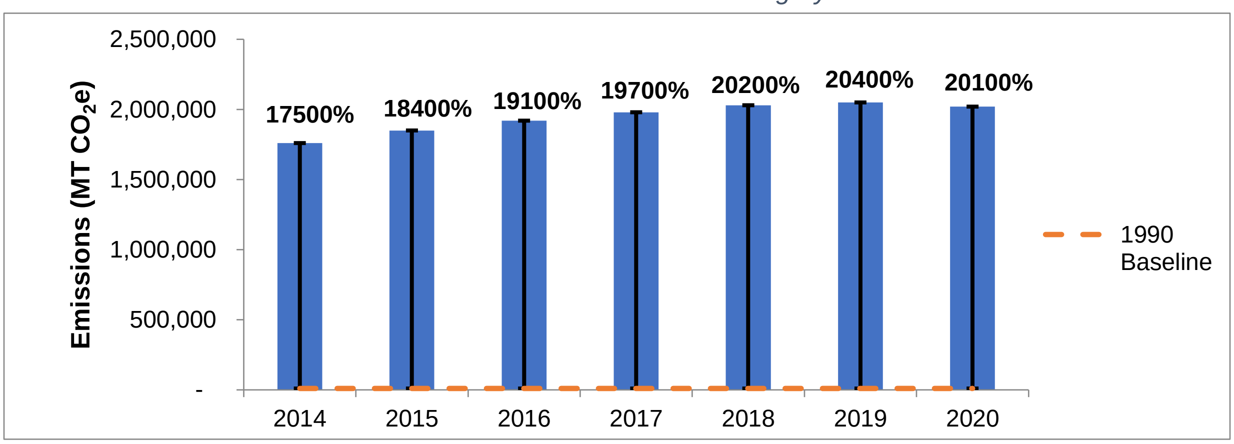


Figure 12. IPPU Sector Emissions Reductions from Baseline

[6] Industrial process facilities are in the mineral, chemical, and metal production industries. No industrial facilities within Los Angeles meet the thresholds for reporting to statewide and national regulatory agencies, including CARB and the US EPA. As a result, industrial process emissions are not in this inventory. This does not necessarily mean there are no industrial process emissions, only that there are no facilities that meet the reporting thresholds.

4. Conclusion

The City of Los Angeles' community greenhouse gas inventory helps measure and track our progress towards the City's climate goals. The stationary energy sector accounts for the largest portion of emissions and decarbonizing the Los Angeles electricity grid by 2035 will play a key role in reducing this sector's emissions. However, it is important to also continue efforts to reduce energy and fuel consumption and increase electrification across all sectors. Overall, emissions have been decreasing compared to the 1990 baseline, with a reduction of 36% in 2020.

5. Impact of COVID-19 Pandemic on Greenhouse Gas Inventory

The COVID-19 pandemic impacted many aspects of life within the City of Los Angeles and created a notable shift in all three of the City's BASIC emissions sectors. This additional section was included to inform discussion on which changes may be pandemic-related and can then be considered as elastic as opposed to permanent. The methodology is based on trend analysis and should only be taken as a general estimate of what emissions may have been expected in a business-as-usual (BAU) scenario.

5.1 Stationary Energy

The stationary energy sector did not see an unusually large overall reduction but the electricity and natural gas consumption had significant shifts from the commercial subsector to the residential subsector. The commercial subsector had a 15% emissions reduction from 2019 to 2020 which accounted for 87% of the overall stationary energy emissions reduction from 2019 to 2020. This decrease was much larger than the commercial subsector was on track to have. The residential sector had a 0.3% emission increase from 2019 to 2020 when it was on track to have more emissions reduction. These shifts are likely due to many offices moving from in-person to remote work.

The residential and commercial electricity emissions have been graphed alongside consumption since both usage and decarbonization affect the overall emissions. Historically, between the two subsector, commercial usage has accounted for about 62% while residential usage was around 38%. In 2020, commercial usage share reduced to about 57% while the residential share increased to 43%.

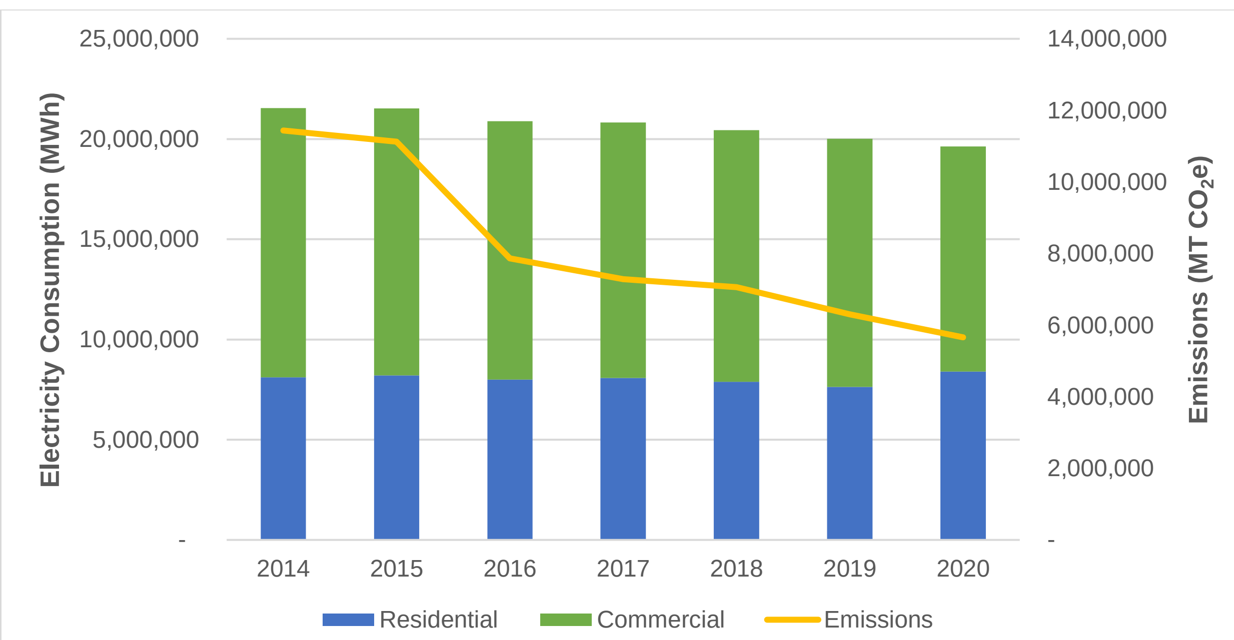


Figure 13. Residential and Commercial Electricity Consumption vs Emissions

For residential and commercial natural gas, emissions have been graphed with heating degree days. A heating degree day (HDD) is the number of degrees by which a daily average temperature is below a base temperature and may therefore require space heating. 2019 had a relatively high number of HDDs. 2020 had a normal number of HDDs but overall usage did not go back down. In addition, the residential usage share has grown slightly from an average of 62% to a share of 64% in 2020.

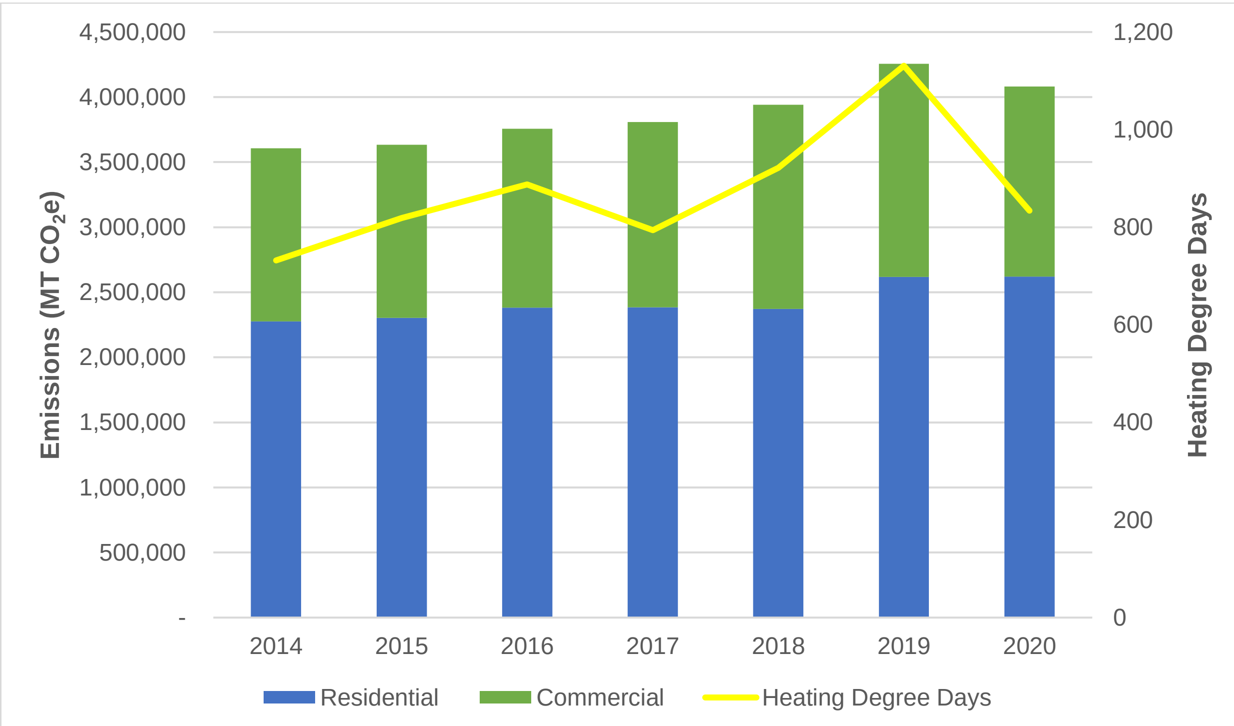


Figure 14. Residential and Commercial Natural Gas Consumption vs HDD

5.2 Transportation

The transportation sector was greatly impacted by the pandemic since the on-road transportation subsector is responsible for 86% of this sector's emissions and had a 27% decrease from 2019 to 2020 due to the steep decrease in VMT throughout the "Safer At Home Order". This on-road transportation emissions reduction contributed 99% of the transportation sector's emissions and 49% of the overall inventory emissions reductions from 2019 and 2020. Since 2014, VMTs have been slowly rising while fuel efficiency (graphed as "Emissions per VMT") has steadily decreased. On-road transportation emissions have mostly tracked with fuel efficiency but in 2020, it followed the steep decrease that VMT had. The steep decrease in VMT was likely caused by LA's "Safer at Home" order and the shift from in-person to remote work.

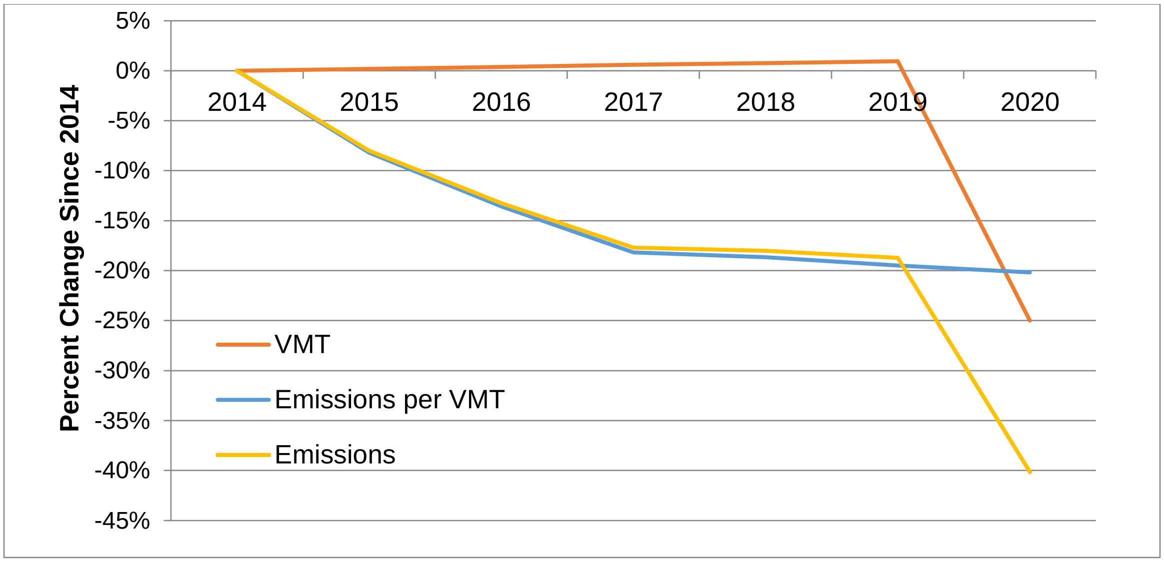


Figure 15. On-road Trends

5.3 Waste

The waste sector had a small decrease in solid waste tonnage to landfill which was an outlier from the trend. This may have been due to a shift in the type of waste being disposed during the pandemic (i.e. lighter weight material) but this can't be confirmed without the exact 2020 waste composition.

5.4 Overall Emissions

Emissions reduction in 2020 was not necessarily a complete outlier when looking at the overall emissions trend. For example, overall reduction in 2018, 2019, and 2020 compared to 1990 was 24%, 30%, and 36%, respectively. This is likely due to the largest driver of emissions reduction from year to year, decarbonization of our electricity grid, not necessarily being impacted by the pandemic. From 2019 to 2020, LADWP has increased the renewable energy content from 34.1% to 36.7%. Looking through each subsector is where potential pandemic effects start to show. Again, the data analysis and reasoning in this section should not be used as definitive answers as to why certain emissions changed during this pandemic. Instead, this section will hopefully provide some additional insight on the emissions reductions and shifts in the 2020 Community GHG Inventory and help inform policymakers and stakeholders when shaping climate action around the shift in how Angelenos live, work, and connect.

6. List of Preparers

Personnel	Project Role
Karina Gonzalez	Technical Support
Stephanie Gee	Project Lead
Mahsa Ostowari	Project Manager
Paul Cobian	Program Manager
Hassan Rad	Division Manager

LA Sanitation & Environment (LASAN), recognized as a national leader in environmental services and programs, is a critical partner in the City's climate response and in advancing the path towards the City's climate goals. LASAN is committed to proactively addressing climate change and supporting climate action in line with our mission to protect public health and the environment.

Building on nearly a decade of experience, LASAN's Climate Action Program supports the City's path towards carbon neutrality as outlined by the Sustainable City pLAn. Housed within the Regulatory Affairs Division of LASAN, this program collaborates with City departments, policymakers, and outside agencies on climate-related reports and activities.

For more information about the Climate Action Program, please contact us at san.climateaction@lacity.org or (213) 485-3640 or visit us at www.lacitysan.org/climateaction.