



Planning & Community Development

Greenhouse Gas Emissions Inventory

Environmental Advisory Commission

May 14, 2024





Purpose of GHG Inventory

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- Required by the Climate Action Plan (CAP) approximately every five years
- Technical study which:
 - Provides understanding of major sources of greenhouse gas (GHG) emissions and greatest opportunities for reductions
 - Establishes baseline and trends related to GHG emissions and helps assess progress towards reductions
 - Describes GHG emissions accounting and reporting principles
 - Helps establish a basis for developing mitigation strategies based on largest sources and guide future CAP updates



Background

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- Baseline GHG inventory prepared in 2009
- Updated GHG inventory prepared in 2013 as part of the General Plan Update
 - Provided additional data to inform understanding of changes in Pasadena's GHG emissions
- Climate Action Plan adopted in 2018
 - Pasadena's strategic framework for measuring, planning, and reducing the City's share of GHG emissions.
 - Requires a GHG inventory be conducted approximately once every five years (starting in 2020)



GHG Reduction Goals

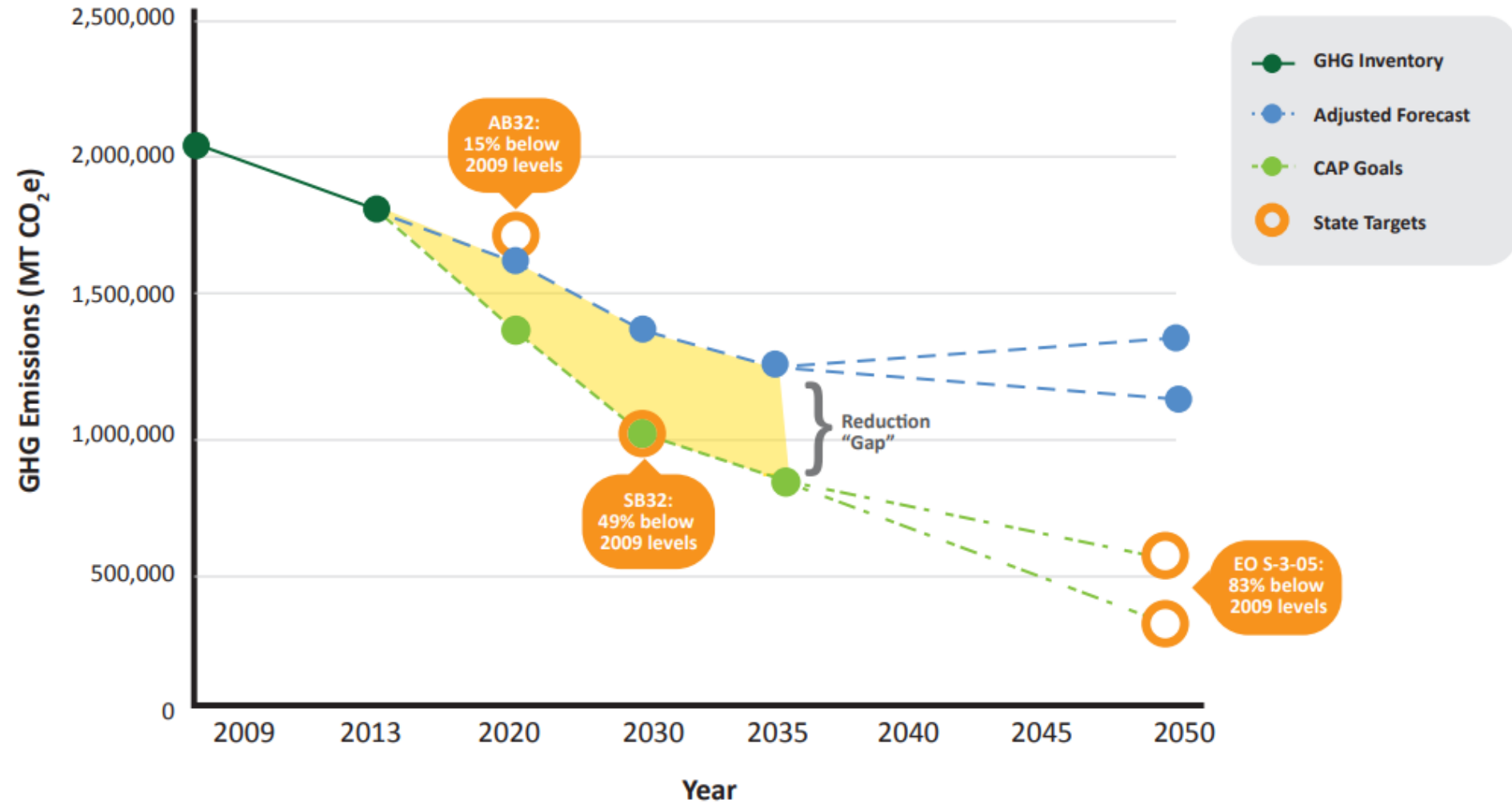
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Year	State Reduction Targets	CAP Reduction Goals <i>(relative to 2009 baseline and state-wide targets)</i>
2020	1990 levels by 2020 (Assembly Bill 32)	27% below 2009 levels (equivalent to 14% below 1990 levels)
2030	40% below 1990 levels (Senate Bill 32)	49% below 2009 levels (equivalent to 40% below 1990 levels)
2035	The state does not have a 2035 target	59% below 2009 levels (equivalent to 59% below 1990 levels)
2050	80% below 1990 levels (Executive Order S-3-05)	83% below 2009 levels (equivalent to 80% below 1990 levels)



CAP GHG Reduction Goals

Planning & Community Development





CAP GHG Reduction Goals

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	2020 (MT CO ₂ e)	2030 (MT CO ₂ e)	2035 (MT CO ₂ e)	2050 (MT CO ₂ e)
Adjusted Emissions Forecast	1,671,934	1,408,063	1,276,128	1,262,573 - 1,304,788
State-wide Emissions Target	1,738,183 (15% below 2009 levels)	1,042,910 (49% below 2009 levels)	The State does not have a 2035 target	347,637 (83% below 2009 levels)
Reductions to Achieve State-wide Emissions Target	0 ¹³	365,153	The State does not have a 2035 target	914,936 - 957,151
CAP Emissions Goal	1,492,793 (27% below 2009 levels)	1,042,910 (49% below 2009 levels)	838,418 (59% below 2009 levels)	347,637 (83% below 2009 levels)
Reductions to Achieve CAP Emissions Goal	179,141	365,153	437,710	914,936 - 957,151



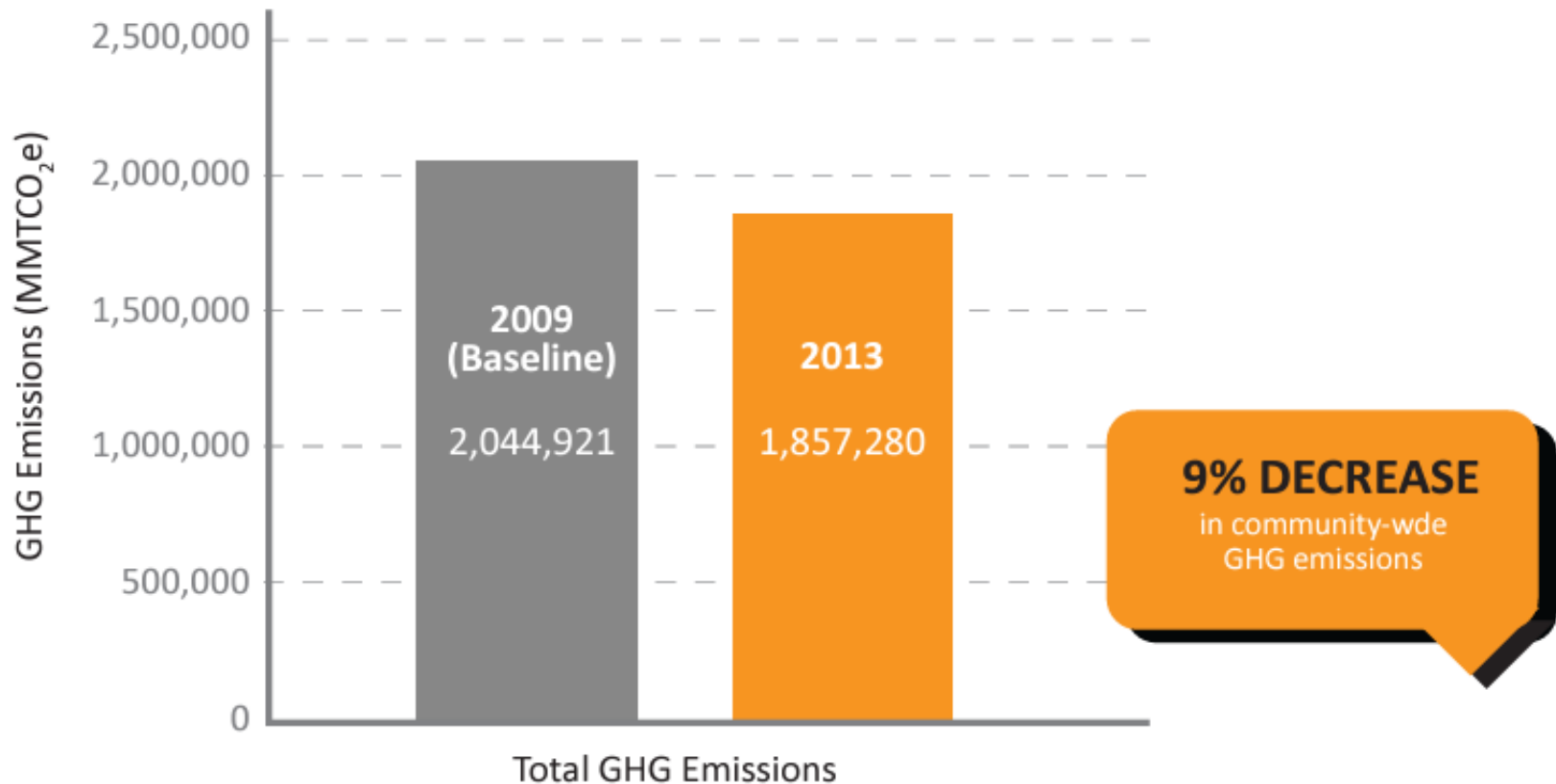
Updated GHG Inventory



GHG Emissions Progress (2009-2013)

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Figure 2.3: Recent Trend of Community-wide GHG Emissions (2009-2013)

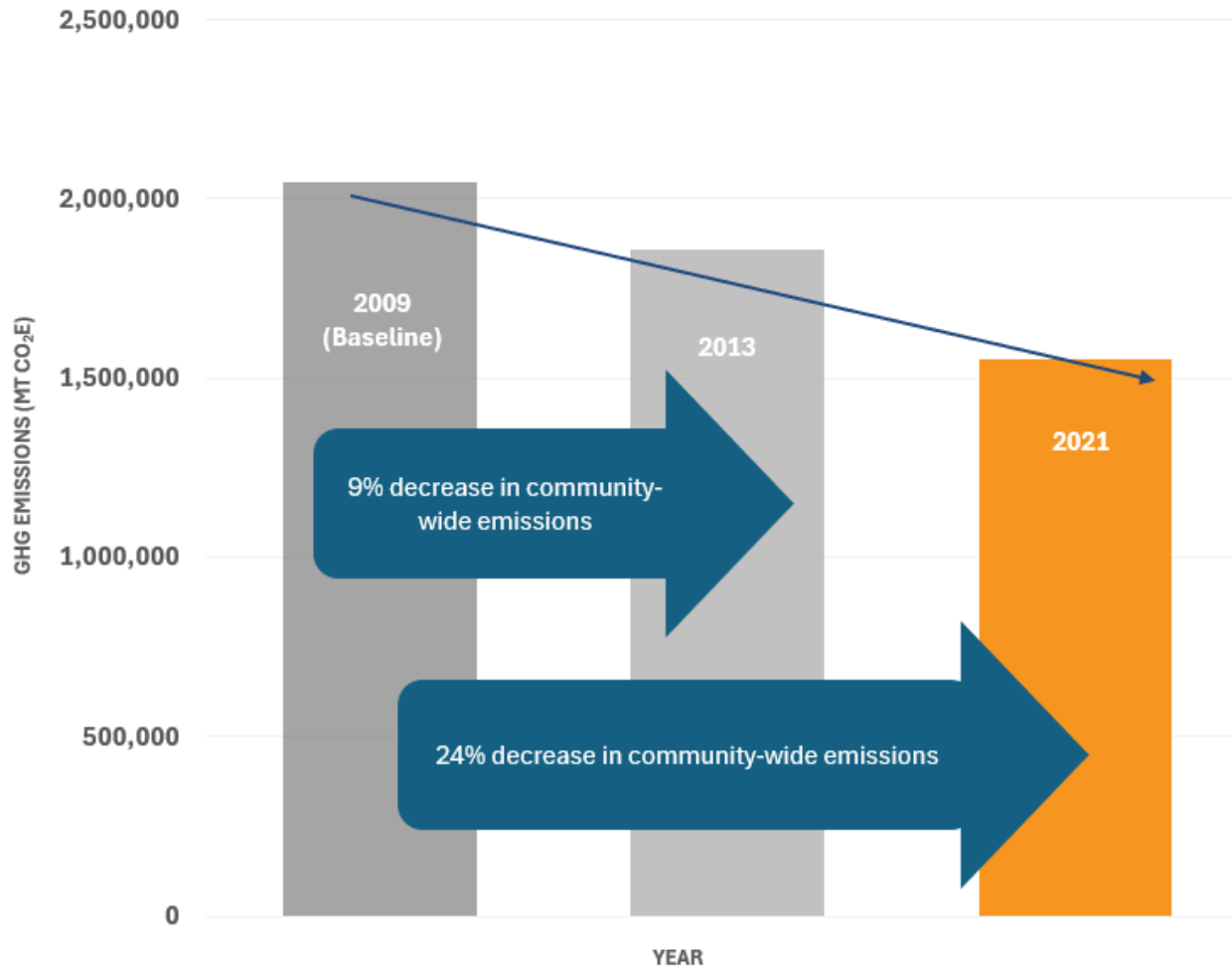




GHG Emissions Progress (2009-2021)

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City of Pasadena Community-wide GHG Emissions
(2009 - 2021)





GHG Emissions Progress (2009-2021)

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Sector	2009 Emissions [MT CO ₂ e]	2013 Emissions [MT CO ₂ e]	2021 Emissions [MT CO ₂ e]	Difference Between 2013 and 2021 [MT CO ₂ e]	Difference (%)	Difference Between 2009 and 2021 [MT CO ₂ e]	Difference (%)
Energy	956,239	804,842	604,604	-200,238	-25%	-351,635	-37%
Transportation	1,054,901	972,665	905,061	-67,604	-7%	-149,840	-14%
Waste	15,019	24,616	24,576	-40	0%	9,557	64%
Water/Wastewater	18,762	55,157	20,863	-34,294	-62%	2,101	11%
Total	2,044,921	1,857,280	1,555,105	-302,175	-16%	-489,816	-24%

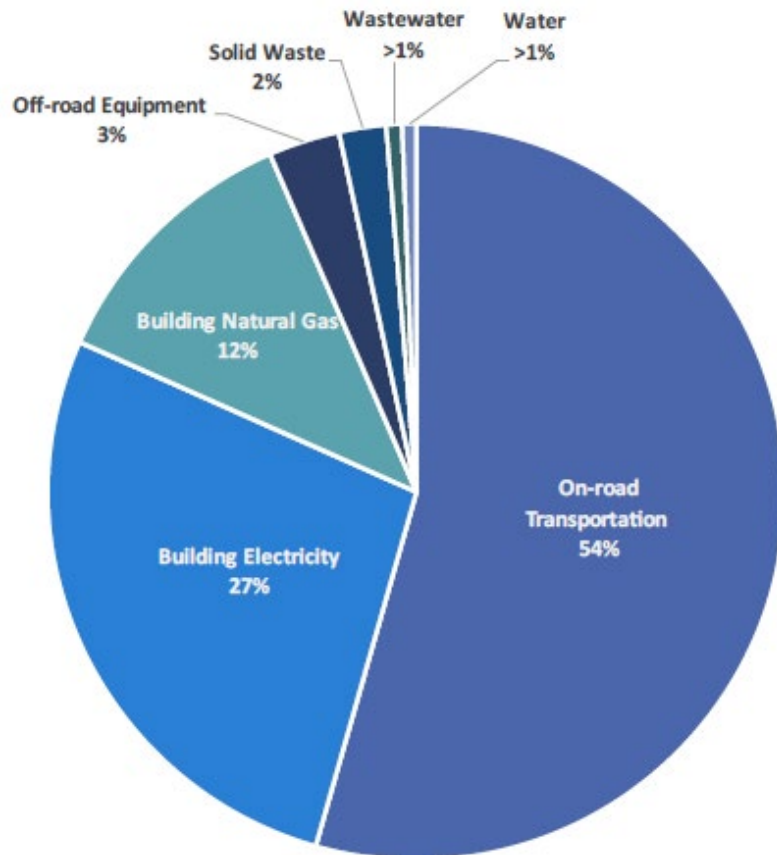
Note: Emissions from the Rose Bowl were included in the 2009 municipal emissions inventory, whereas the emissions from the Rose Bowl were included in the community and municipal emissions inventories in 2021. Transportation from Rose Bowl operations resulted in 2,484 MT CO₂e, which is <1 percent of the total community transportation emissions in 2021. Additionally, the 2021 emissions inventory included solid waste process emissions, which resulted in 3 percent of the total solid waste emissions (918 MT CO₂e). In total, the additional emissions sources resulted in <1 percent of the total 2021 emissions (3,402/1,572,995). To understand an exact change in emissions, the models and GWPs should be updated for the 2009 emissions inventory and the updated emissions analysis could then be compared with 2021 more accurately.



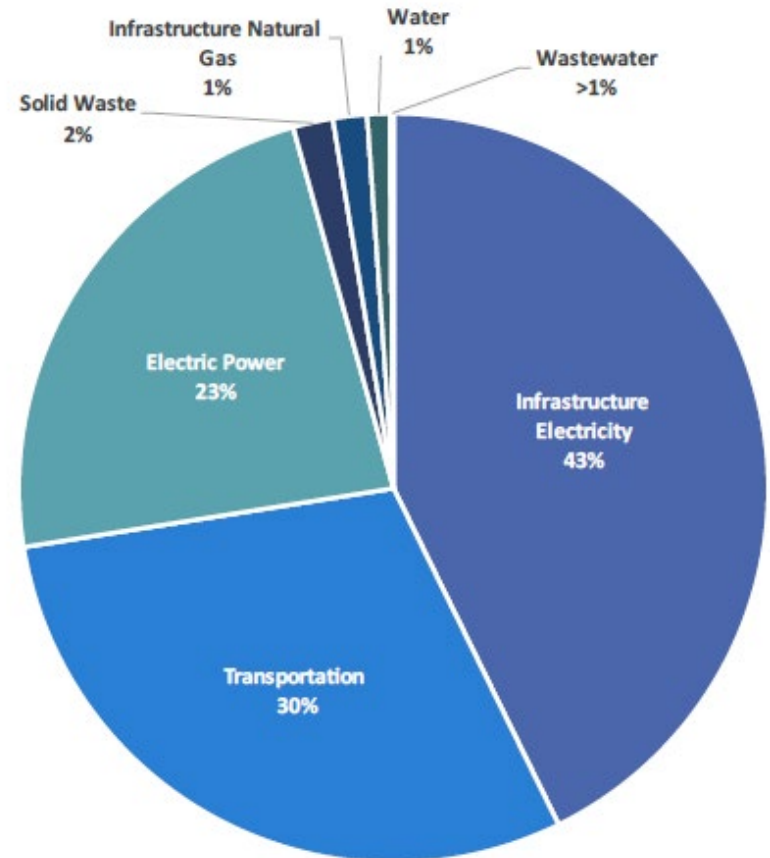
Current GHG Inventory (2021)

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Community GHG Emissions by Sector



Municipal GHG Emissions by Sector





Forecasting

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- "Business as Usual" Forecast
 - Provides forecast of how future GHG emissions change as population, housing, and job growth occur if current activities continue, absent any new state/local regulations
- "Adjusted" Forecast
 - Provides forecast of how currently adopted State legislation would reduce GHG emissions compared to the "business as usual" scenario.
 - Represents State's contribution to reducing local GHG emissions to meet State targets
 - Does not include contribution from local policies/actions



Forecasting - Statewide Targets

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Pasadena CO₂e Forecast Scenarios

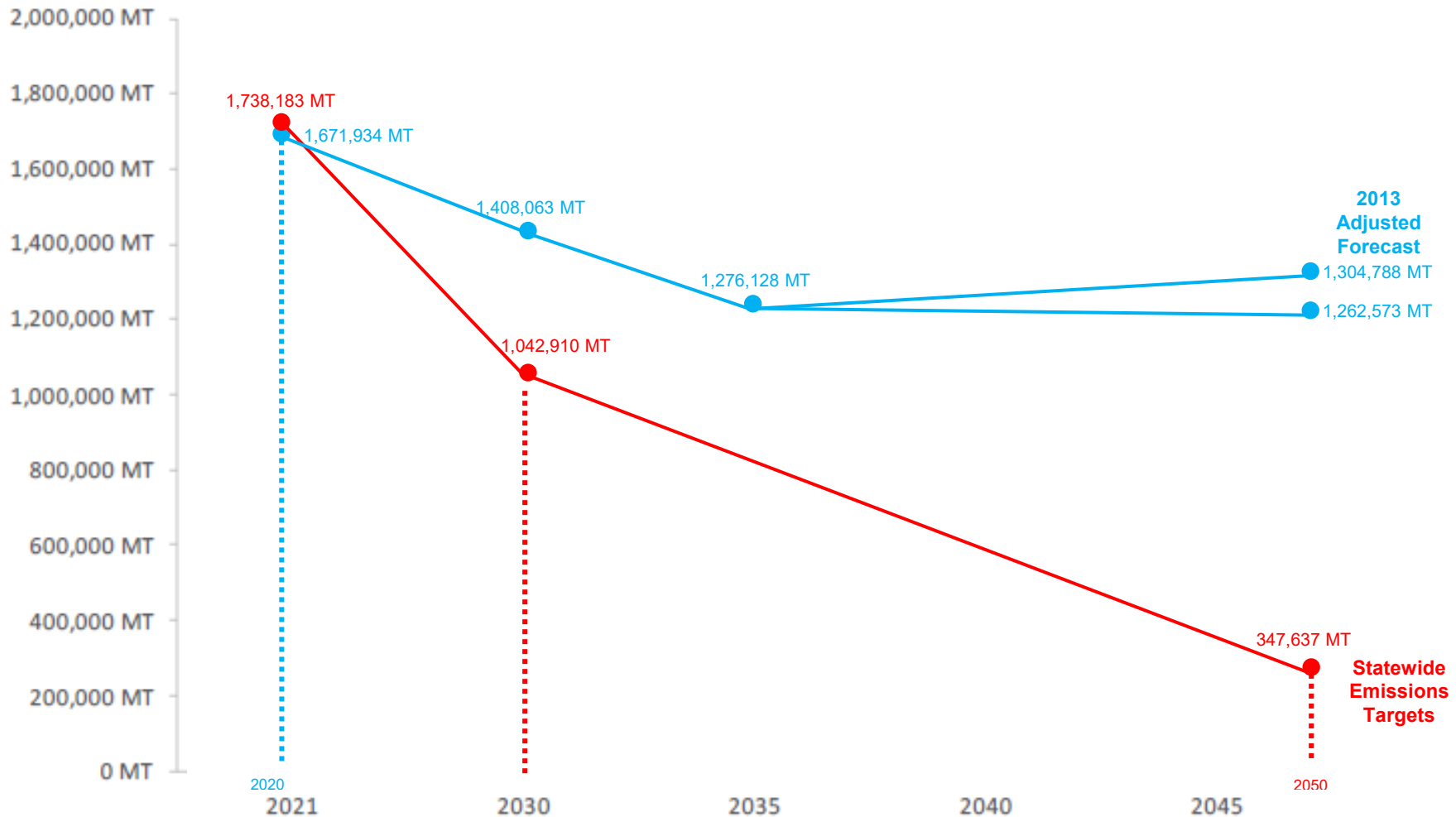




Forecasting - 2013 GHG Inventory

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Pasadena CO₂e Forecast Scenarios

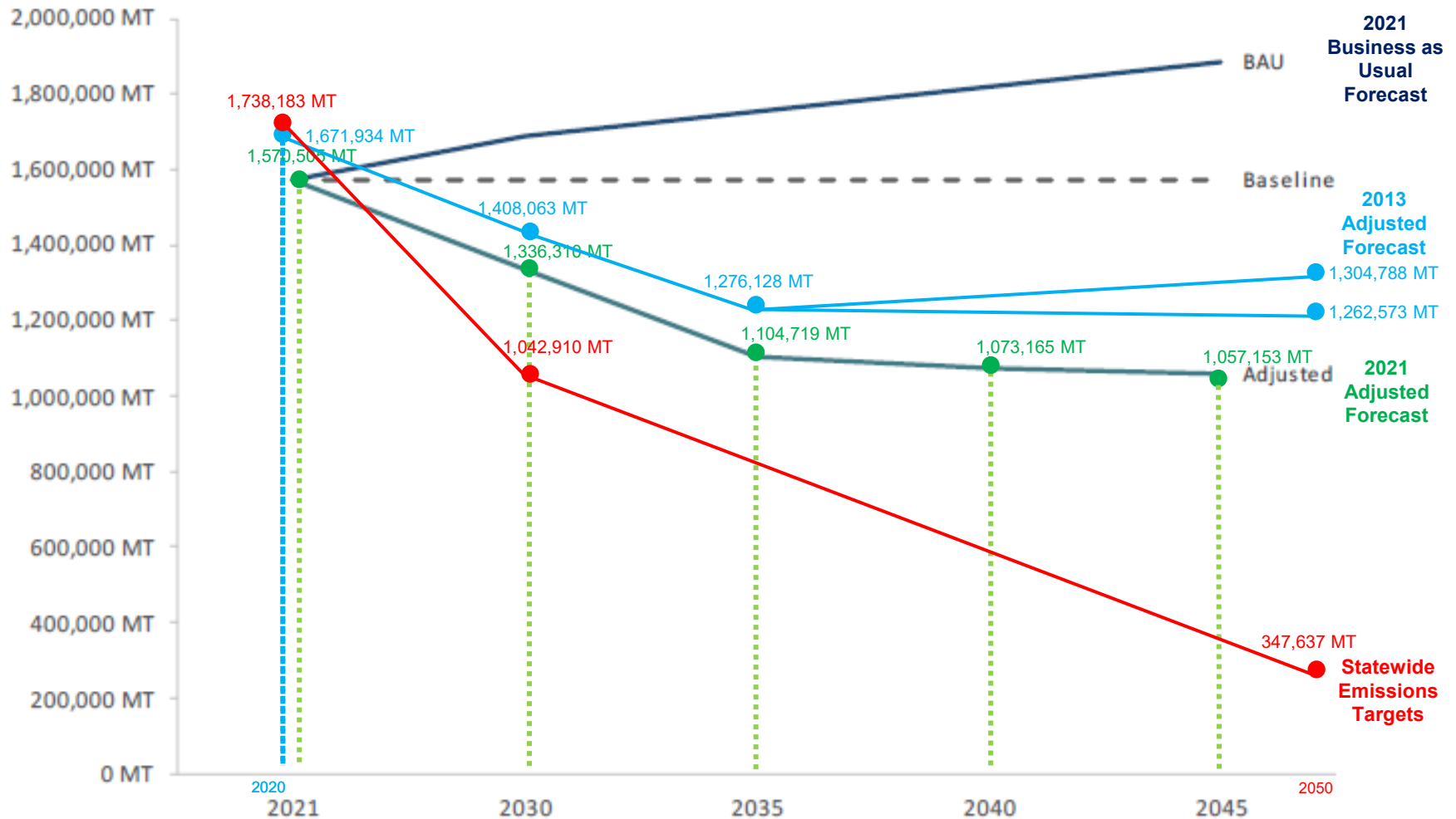




Forecasting - 2021 GHG Inventory

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Pasadena CO₂e Forecast Scenarios

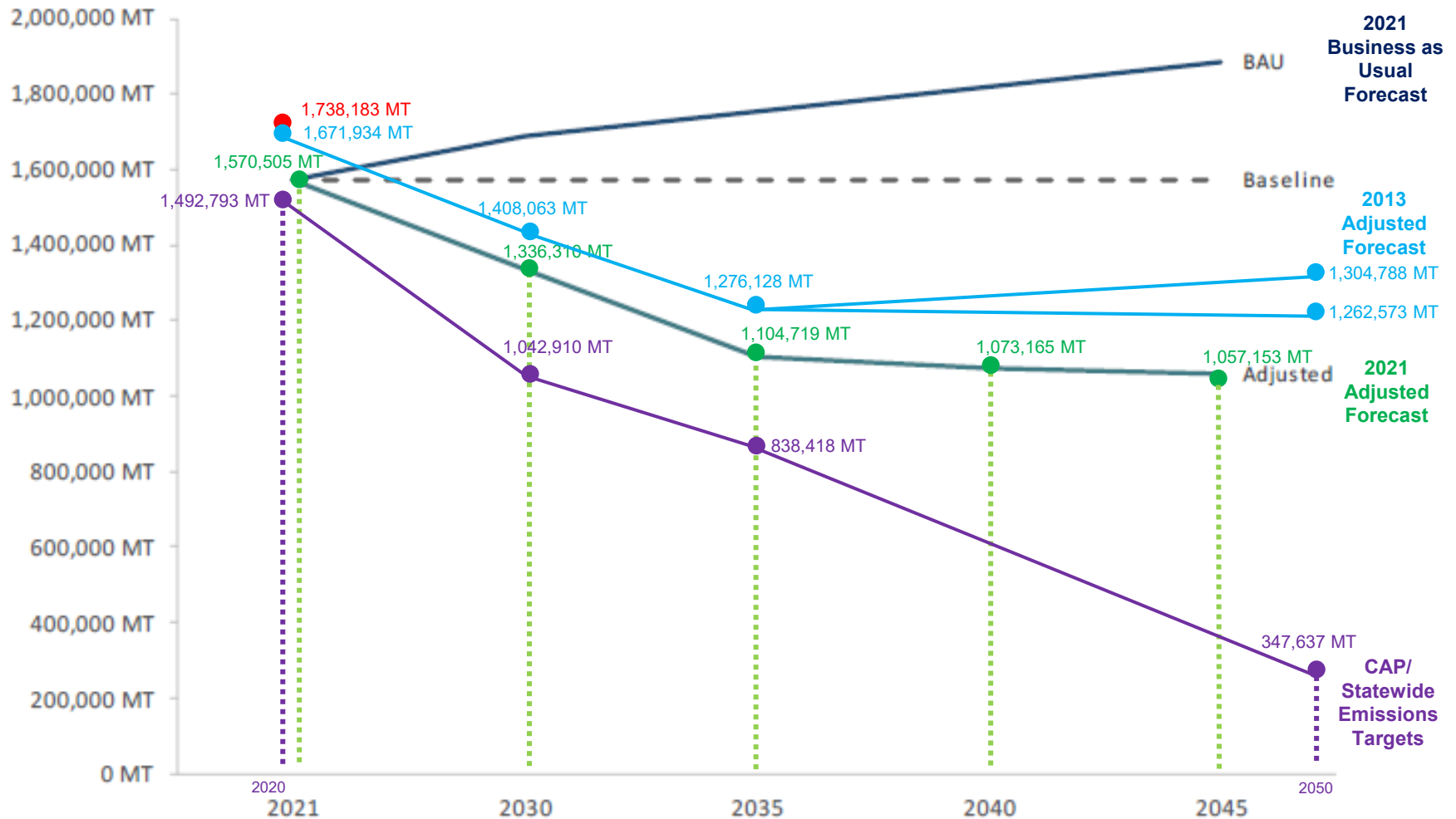




Forecasting with CAP Targets

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Pasadena CO₂e Forecast Scenarios





Local Efforts - Completed

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Emergency Climate Resolution (#9977)

- Adopted by City Council in January 2023
- Aims to achieve carbon neutrality by 2030, in advance of California Air Resources Board target date of 2045

Pasadena Water and Power

- Power Integrated Resources Plan
 - Adopted by City Council in December 2023

Planning Department

- Specific Plan Updates
 - LASP, ECSP, SFOSP, and CD Specific Plans adopted (2021-2023)
 - Specific Plans include requirements for shading/urban cooling measures and climate-appropriate planting



Local Efforts - Completed

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Building Department

- Building Electrification Ordinance
 - Adopted August 2022
 - Requires certain projects to include all-electric infrastructure
- Low Impact Development (LID) Plans
 - Requires certain projects to include specific stormwater management strategies

Department of Transportation

- Transportation Impact Analysis Guidelines Update
 - Adopted April 2022
- Pedestrian Transportation Action Plan
 - Adopted February 2024



Local Efforts - Completed

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Public Works

- Organics Recycling Initiatives Mandated by State
 - Residential yard waste composting (18,500 tons/yr)
 - Initiated in January 2020
 - Commercial/Residential Curbside Organics Recycling
 - Implemented in January 2022
 - Six Community Composting Hubs installed at public parks in 2023
- Fully transitioned to Renewable Diesel Fuel (2022)



Local Efforts - Upcoming/Ongoing

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Planning Department

- Specific Plan Updates
 - North Lake, Fair Oaks/Orange Grove, Lamanda Park, and East Pasadena plans in progress

Water and Power

- Power IRP
 - Optimized Strategic Plan to achieve 2030 carbon neutrality goal
- Energy Efficiency
 - \$21,780,601 spent on energy efficiency programs since 2017.
 - Efficiency programs drive 106,155 MWh in energy savings annually.



Local Efforts - Upcoming/Ongoing

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Water and Power

- **Electric Vehicles**
 - \$636,600 spent on 2242 electric vehicle rebates since 2018.
- **Electric Vehicle Chargers**
 - \$242,084 spent on 483 residential EV chargers since 2018
 - \$1,421,362 spent on 391 commercial EV chargers since 2018

Department of Transportation

- **Pasadena Transit Zero Emission Vehicle Rollout Plan**
 - Adopted January 2023
 - Aims to achieve a full ZEV fleet by 2036 in advance of 2040 State Mandate



Local Efforts - Upcoming/Ongoing

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Public Works

- Two new Community Compost Hubs at parks in 2024
- Edible Food Recovery/Distribution Program implementation
- Transition City fleet to Zero-Emission vehicles
- Infuse Renewable Natural Gas (RNG) at City's CNG fuel station (since 2021)



Next Steps

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Present GHG Inventory Update to Municipal Services Committee and City Council

Climate Action Plan Update

- Review 2021 GHG Inventory
 - Analyze trends 2021 GHG emissions compared with 2013 and 2009 emissions for each sector
 - Analyze forecast for 2030, 2035, 2040, and 2045 under the Business as Usual and Adjusted Scenarios
- Develop Request for Proposal (RFP) Scope of Work for CAP Update
 - Include local actions/policies since 2021 GHG Inventory and evaluate GHG emission reduction potential from those policies
 - The CAP is not the only city plan that addresses climate change. Several new plans have been developed and updated since CAP adoption in 2018 and the CAP Update process should incorporate and align with these plans.
 - Blueprint for next phase of the City's climate work from 2025-2030 with focus on implementation steps needed to address remaining tasks before 2030
 - *CAP goal is to achieve GHG emissions 49% below 2009 levels by 2030*
- Climate Action Funding
 - Inflation Reduction Act funds
 - Other grant funding



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Greenhouse Gas Emissions Inventory

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Policy Background

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- **Executive Order S-3-05 (2005)**
 - Reduce statewide GHGs to 1990 levels by 2020 and 80% below 1990 levels by 2050
- **Assembly Bill 32 (2005)**
 - Reduce statewide emissions to 1990 levels by 2020 (approx. 15% below 2008 levels)
 - California Air Resources Board to prepare a plan to achieve target
- **Assembly Bill 32 Scoping Plan (2008)**
 - Roadmap to achieve AB 32 target
 - Encourages local governments to reduce GHG emissions consistent with statewide target



Policy Background

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- **Senate Bill 97 (2009)**
 - Analyze and mitigate GHGs under CEQA
 - Jurisdictions can use Climate Action Plans to reduce impacts of individual projects
- **Plan Elements (CEQA Guidelines §15183.5)**
 - GHG Inventory and forecast
 - Reduction target
 - Measures to meet target
 - Monitoring mechanism
 - Adopted in public process following environmental review



Department Strategies

Planning & Community Development

- Climate Action Plan (Planning)
 - Greenhouse Gas Inventory (Planning)
 - Climate Action Plan Consistency Checklist (Planning)
- Specific Plan Updates (Planning)
- Building Electrification Ordinance (Building)
- Low Impact Development Plans (Building)
- Composting - Community-based composting hubs
- Food Recycling
- Zero Waste Plan



Climate Action Plan GHG Reduction Goals

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5 Strategies



Sustainable
Mobility &
Land Use



Energy
Efficiency &
Conservation



Urban
Greening



Water
Conservation



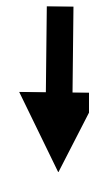
Waste
Reduction



27 Measures



Defines the direction to
achieve the CAP's goals



142 Actions



Action steps that will be
implemented over time

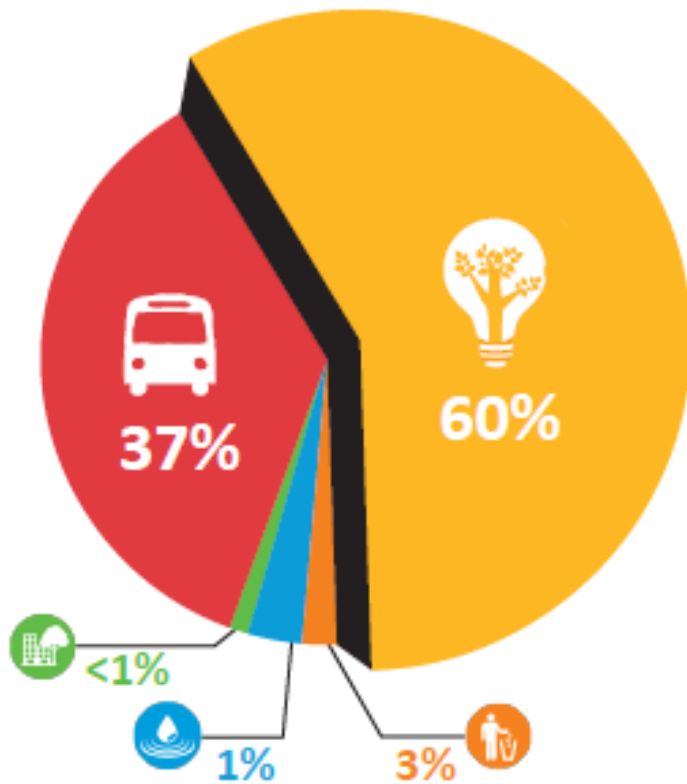


Climate Action Plan GHG Reduction Strategy

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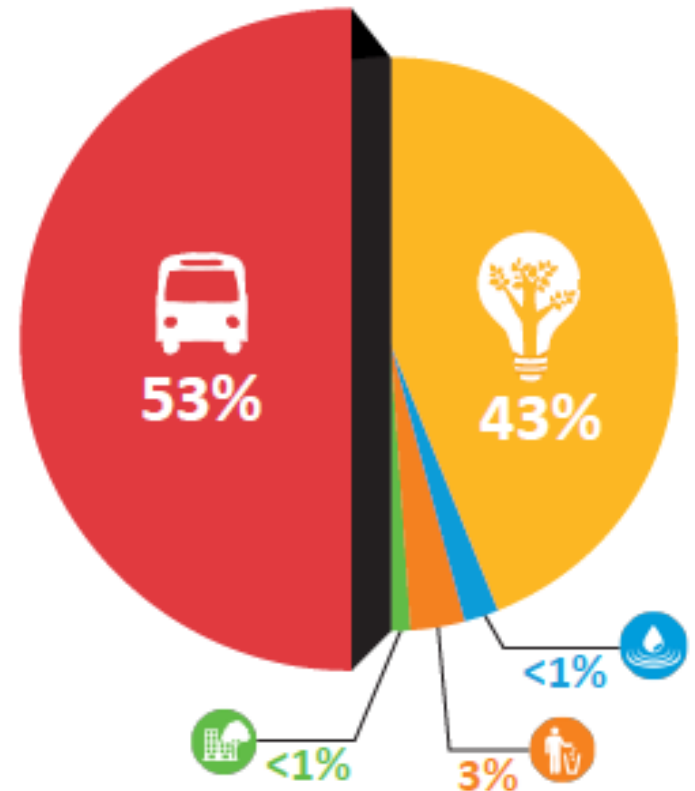
2020 STRATEGY

Energy Focused



2035 STRATEGY

Transportation Focused





Monitoring, Reporting, and Implementation

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Monitoring

- Greenhouse Gas Inventory (to be conducted every 5 years, starting in 2020)
 - Project extended due to COVID
- Tracking of implementation actions and progress of performance indicators

Reporting

- Annual Reports (in Report Card format)
 - Provides a yearly snapshot of quantifiable measures and whether goals are achieved, likely to be achieved by target year, or are in progress
 - 2020/2021 reports not provided (COVID-related)



Monitoring, Reporting, and Implementation

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Implementation

Project-Level

- Climate Action Plan Consistency Checklist
 - For projects requiring discretionary review and subject to CEQA
 - Projects that are exempt from CEQA are deemed consistent with the CAP*
 - *Projects utilizing a Class 32 infill exemption are still subject to compliance with the CAP checklist

Citywide-Level

- Staff reviews how measures and actions are each implemented by individual departments



CAP Consistency Checklist

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Option A - Sustainable Development Actions

- Six mandatory actions:
 - Provision of bicycle storage
 - Transportation Demand Management plan
 - Provision of wiring for vehicle chargers
 - Use of energy-efficient passive design (awnings, landscaping)
 - Use of drought-tolerant landscaping/drip irrigation
 - Provision of recycling bin areas
- Minimum of four selective actions, such as:
 - Demonstrating that project exceeds 2016 Title 24 energy efficiency standards
 - Development of project within 1/4 mile of major transit stop
 - Use of permeable surfaces to reduce stormwater runoff
 - Use of recycled building materials in project
 - Ensuring that project results in a net gain of trees
 - Other options are on the Checklist
- To date, all projects have utilized Option A



CAP Consistency Checklist

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Option B - GHG Efficiency Thresholds

- Projects must demonstrate consistency with the City's per-person GHG thresholds
- Requires modeling of total GHG emissions for the project (construction emissions amortized over 30 years as well as operational emissions)
- Annual emissions are then divided by the project's service population (residents and/or employees)

Option C - Net Zero GHG Emissions

- Projects must demonstrate that construction would not result in a net increase of GHG emissions
- Requires model of existing emissions and project emissions level (factoring in construction emissions and annual emissions over 30 years) to show net change
- Reduction can be achieved by purchasing carbon offsets



Other Significant Efforts

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Specific Plan Updates

- Updated plans include sustainability and climate resilience standards

Building Electrification Ordinance

- Requires certain projects to include all-electric infrastructure

Low Impact Development (LID) Plans

- Requires certain projects to include specific stormwater management strategies



Specific Plan Update

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Recently adopted Specific Plans include sustainability and climate resilience standards:

- Increased residential density near commercial uses and transit
 - Encourages alternative modes of transportation and reduced reliance on automobiles
- Updated parkway and street tree requirements
 - Improves stormwater capture, street tree health, and encourages carbon sequestration
- Requirement for shade structures along north side of Colorado Boulevard
 - Provides additional shade for pedestrians and potential reduction in energy usage for building cooling
- Updated landscaping requirements for native/climate appropriate plant species, water usage, and encouragement of micro-climates



Building Electrification Ordinance

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- Adopted on August 11, 2022
- Requires certain projects to include all-electric infrastructure (no gas appliances):
 - Newly constructed multifamily buildings (more than 3 units)
 - Newly constructed mixed-use buildings
 - Newly constructed commercial buildings
 - Existing commercial buildings with new additions
 - When the addition adds 50% or more of the existing square footage), entire building must convert to all-electric
- Ordinance intended to reduce fossil-fuel consumption within buildings and contribute to healthier environment



Low Impact Development (LID) Plans

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- Stormwater management strategy to conserve water and limit stormwater runoff on-site
- Adopted in December 2012 by the California Regional Water Quality Control Board
- Projects that require a LID plan include:
 - Single-Family hillside properties
 - Commercial malls and Industrial parks with 10,000 square feet or more of surface area
 - Restaurants, retail gasoline, and parking lots with 5,000 square feet or more of surface area (or 25 or more parking spaces for parking lots)
 - Street and road construction with 10,000 square feet or more of impervious surface area
 - Development projects ≤ 1 acre with more than 10,000 square feet of impervious surface area
 - Projects involving creation, addition, or replacement of 5,000 square feet or more of impervious surface area on developed sites
 - Construction resulting in an alteration to more than 50% of existing impervious surface area on an already-developed site if the site was not already subject to post-construction stormwater quality control requirements