



## *CITY OF CARMEL-BY-THE-SEA*

# **Greenhouse Gas Emissions: Inventories, Forecasts, and Candidate Reduction Measures**

# LSA

Climate Committee Meeting

October 21, 2021

# LSA Team Introductions



## **Michael Hendrix: Project Manager**

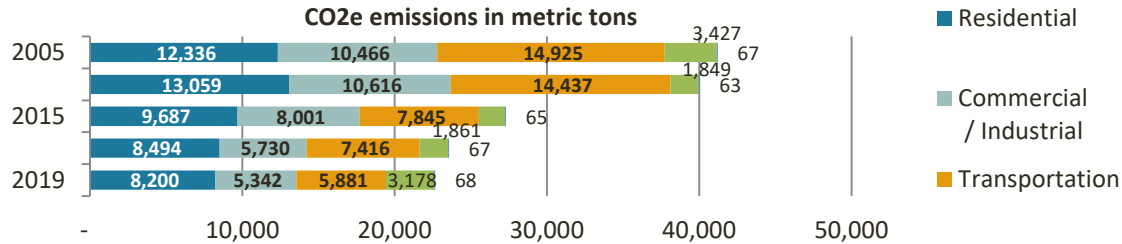
- > 25 Years of Experience involving GHG emissions analysis, climate change analysis, climate action planning
- Provides State Agencies recommended protocol updates.

## **LSA's Role**

- Assist the City and the Committee with the technical data necessary to develop a climate action plan.
- Provide recommendations based on experience and knowledge of the protocols regarding targets, reduction measures, and implementation mechanisms.

# Inventories Developed by AMBAG

## City of Carmel 2005 to 2019 GHG Emissions by Sector

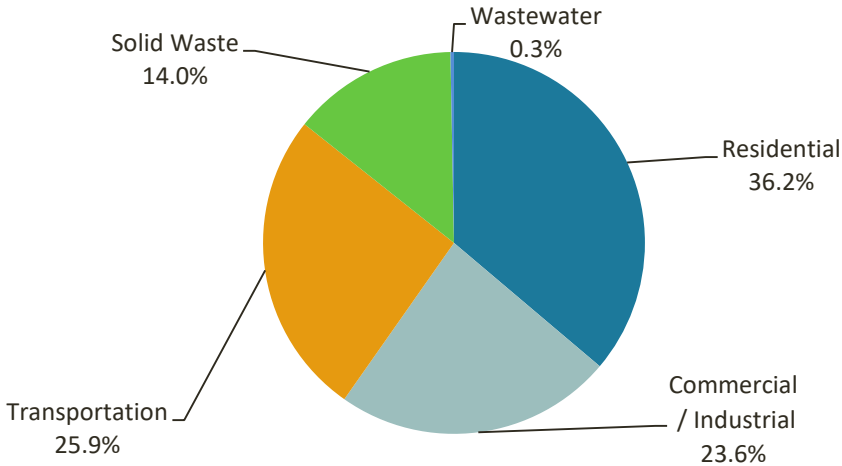


### City of Carmel 2005-2019 Community-wide GHG emissions

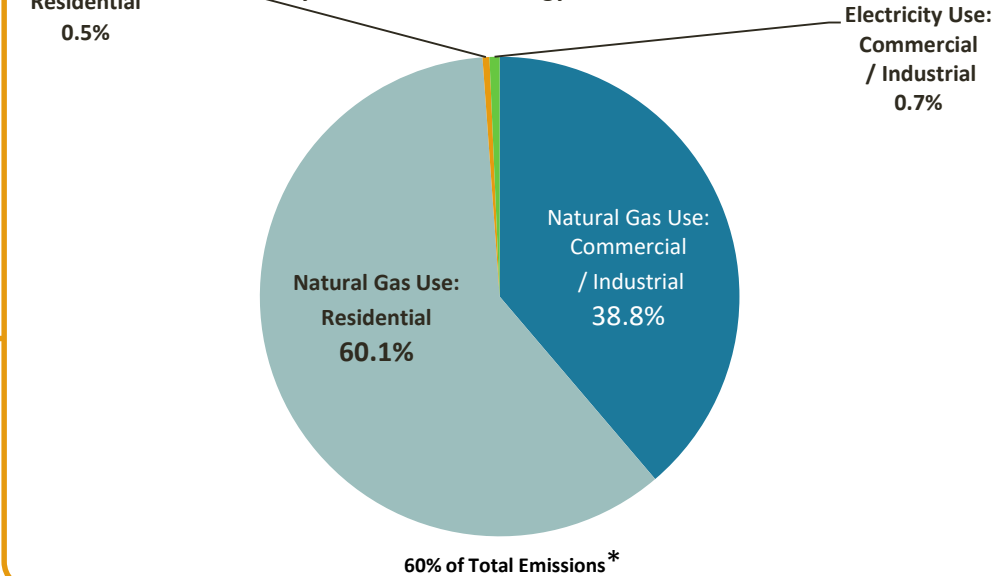
Community CO2e Emissions by Sector	Residential	Commercial / Industrial	Transportation	Solid Waste	Wastewater	Total
2005	12,336	10,466	14,925	3,427	67	41,221
2010	13,059	10,616	14,437	1,849	63	40,024
2015	9,687	8,001	7,845	1,722	65	27,320
2018	8,494	5,730	7,416	1,861	67	23,569
2019	8,200	5,342	5,881	3,178	68	22,669
% change 2005 - 2018	-34%	-49%	-61%	-7%	1%	-45%

# Inventories Developed by AMBAG

City of Carmel 2019 GHG Emissions by Sector



City of Carmel 2019 Energy Use GHG Emissions



# Inventory Issues and Potential Solutions

## Issue with Electricity Emission Factor

- Does not show emissions from all generation.
- **Solution:** is to build annual emission factor from monthly generation.

## Issue with Solid Waste

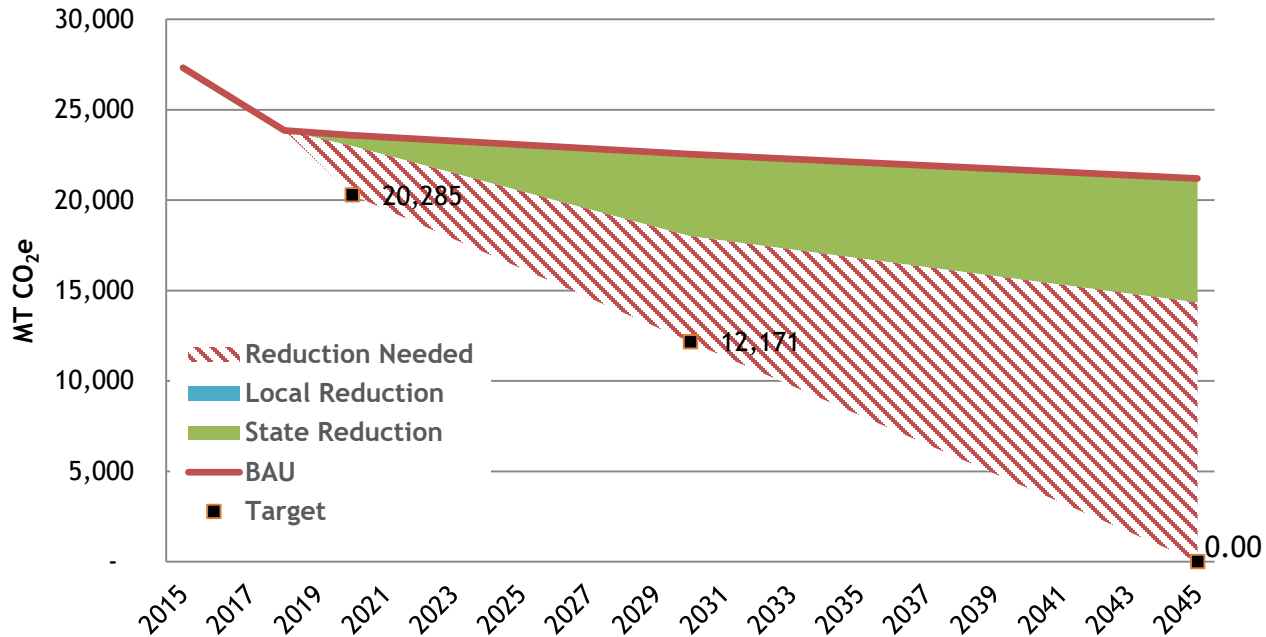
- CalRecycle shows plastics that should have been recycled as part of the waste stream.
- **Solution:** Focus on reuse containers rather than recyclables.

# Inventory Issues and Potential Solutions

## Issue with On Road Transportation

- AMBAG uses boundary method of developing VMT rather than origin/destination.
- Future AMBAG transportation modeling will include Countywide origin/destination VMT but not down to the City level.
- **Solution:** Estimate the trip types within the AMBAG VMT
  - Eliminate Pass-through trips since City does not have jurisdictional control over this type of trip.
  - For commuter trips and visitor trips determine origin/destination and apply fair share portion of VMT to the City.

# Emission Forecasts and Recommended Targets



2015 GHG Inventory as a baseline (2020 target = 15% reduction from 2015 emissions, 2030 target = 40% reduction from the 2020 target, 2045 target = net zero emissions).

# Candidate Reduction Measures



## Goal 1: Increase Energy Efficiency in Existing Residential Units

- Energy Efficiency education and recognition in the residential sector.
- Increase participation in existing energy efficiency programs.
- Home Energy Evaluations.
- Residential home energy renovations.
  - Promote participation in green building programs.
  - Provide incentives to homeowners to convert to electrification.
  - Streamline the permitting process for energy efficiency retrofits.



# Candidate Reduction Measures

## Goal 2: Increase Energy Efficiency in New Residential Units

- Educate City staff and the community on future Title 24 compliance.
- Promote Tier 1 and Tier 2 Green Building Standards.
- Require electrification in new residential units.
- Streamline the permitting process for Tier 1 and Tier 2 Green Building applications.



# Candidate Reduction Measures



## Goal 3: Increase Energy Efficiency in Existing Commercial

- Energy Efficiency education and recognition in the commercial sector.
- Increase business participation in existing energy efficiency programs.
- Business Energy Evaluations.
- Commercial energy renovations.
  - Promote participation in green building programs.
  - Provide incentives to businesses that convert to electrification.
  - Streamline the permitting process for energy efficiency retrofits.
  - Require green building programs for large commercial renovations.

# Candidate Reduction Measures

## Goal 4: Increase Energy Efficiency in New Commercial

- Educate City staff and the community on future Title 24 compliance.
- Promote Tier 1 and Tier 2 Green Building Standards.
- Require electrification in new commercial development.
- Streamline the permitting process for Tier 1 and Tier 2 Green Building applications.



# Candidate Reduction Measures

## Goal 5: Energy Efficiency Through Water Conservation

- Exceed State Water Efficiency Standards.
- Recycled water for certain types of commercial and multi-family landscaping.
- Grey Water Systems.
- Promote rainwater harvesting.



# Candidate Reduction Measures

## Goal 6: Decrease Energy Demand by Reducing the Heat Island Effect.

- Maintain the health of the Urban Forest Canopy.
- Require light reflecting surfaces on rooftops (cool roofs).
- Use cool pavement options when repaving roadways.



# Candidate Reduction Measures

## Goal 7: Decrease GHG Emission By Reducing VMT.

- Develop Bicycle Master Plan.
- Ride Sharing and Bike to Work Programs.
- Electric Vehicle Infrastructure.
- Neighborhood Electric Vehicles (NEV) and NEV Shuttles.
- Shuttle service between the Monterey Airport and destinations in the City.



# Candidate Reduction Measures

## Goal 8: Reduce Solid Waste

- Promote Zero Waste events.
- Promote home composting.
- Promote reuse containers rather than recyclables.
- Educate the community on use of City provided containers.



# Candidate Reduction Measures

## Goal 9: Increase Clean Energy Use

- Incentivize solar panel installation for residential and small commercial.
- Promote energy storage systems installation with solar panels.
- Require large commercial renovations to install solar panels.
- Encourage residents and businesses to participate in the 3CE 100 percent renewable Program.

