



# SAN RAFAEL 2010 GREENHOUSE GAS EMISSIONS INVENTORY

Community and Government Operations

# How to Calculate Emissions

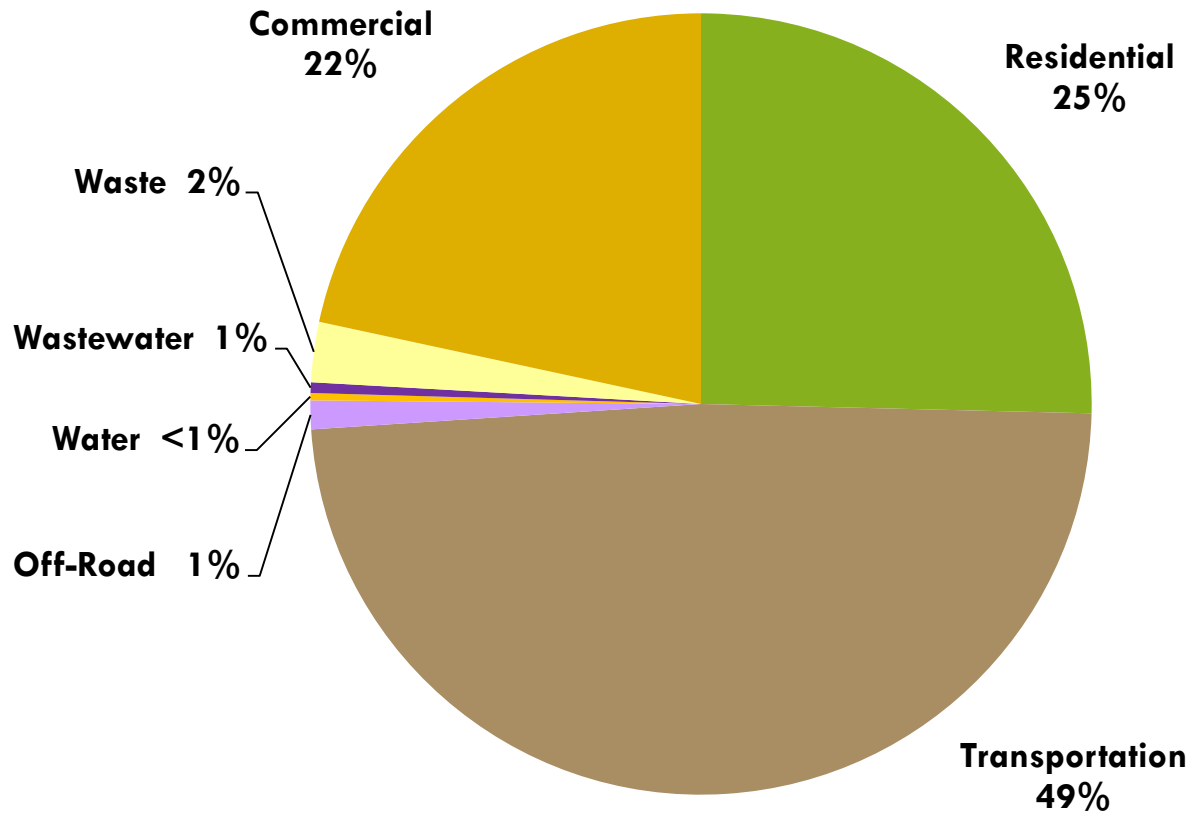
## Activity Data

- Kilowatt hours consumed
- Therms consumed
- Vehicle miles traveled
- Gallons of gasoline burned
- Tons of waste disposed

X Emission Factor =

Carbon Dioxide  
Equivalents (CO<sub>2</sub>e)

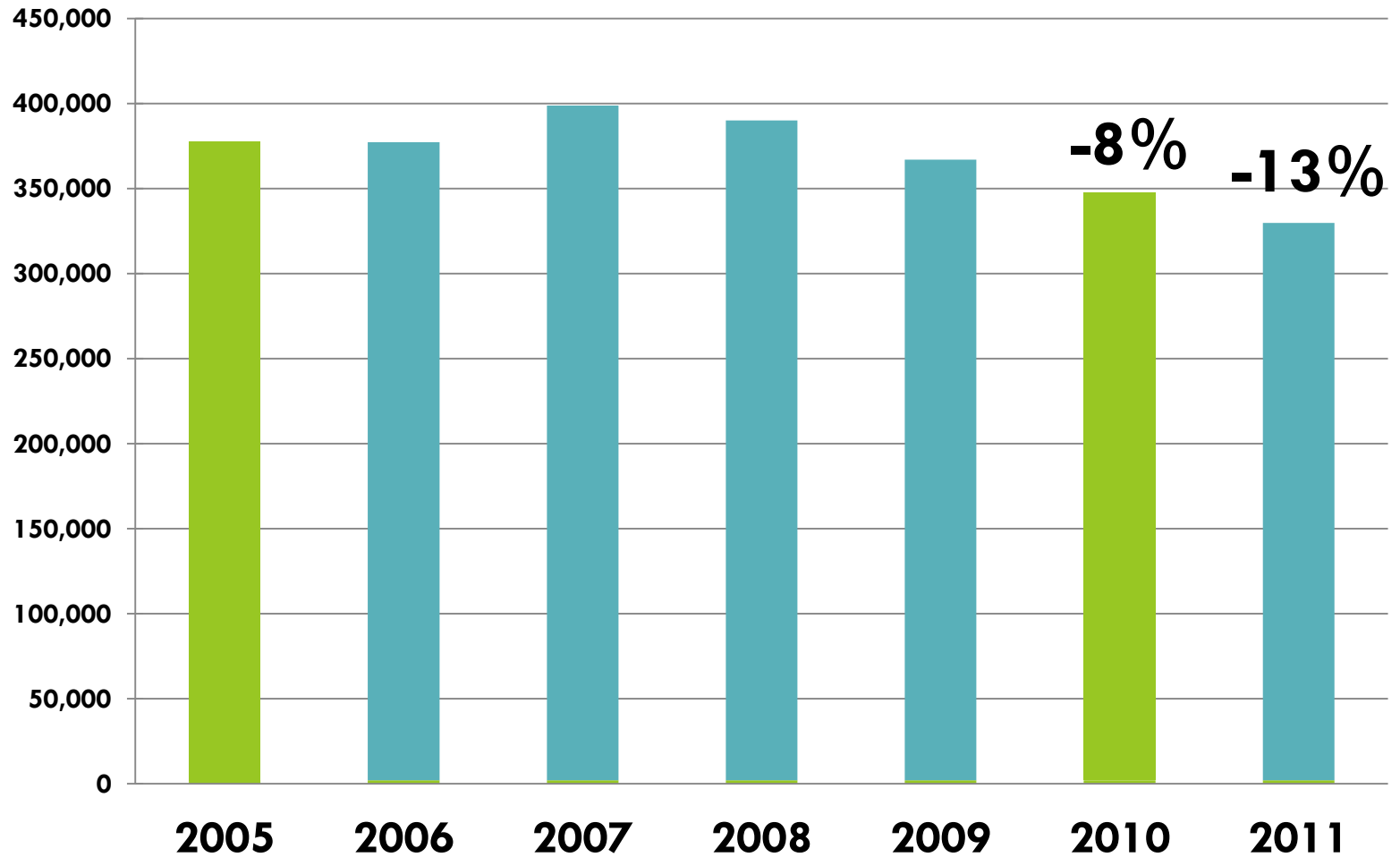
# Sector Share of Emissions



# Community Emissions 2005 vs. 2010

| Sector                | 2005<br>Metric Tons CO <sub>2</sub> e | 2010<br>Metric Tons<br>CO <sub>2</sub> e | Change<br>Metric Tons<br>CO <sub>2</sub> e | % Change   |
|-----------------------|---------------------------------------|--|--|------------|
| Residential           | 89,715                                | 87,694                                   | -2,021                                     | -2%        |
| Commercial/Industrial | 88,116                                | 74,713                                   | -13,403                                    | -15%       |
| Transportation        | 177,338                               | 167,859                                  | -9,479                                     | -5%        |
| Off-Road              | 4,721                                 | 4,095                                    | -626                                       | -13%       |
| Water                 | 1,501                                 | 1,040                                    | -461                                       | -31%       |
| Wastewater            | 1,479                                 | 1,517                                    | 38   | 3%         |
| Waste                 | 12,974                                | 8,598                                    | -4,376                                     | -34%       |
| <b>Total</b>          | <b>375,845</b>                        | <b>345,516</b>                           | <b>-30,329</b>                             | <b>-8%</b> |

# Trend



# Residential

| Source      | 2005<br>Energy<br>Consumption | 2011<br>Energy<br>Consumption | % Change<br>Energy<br>Consumption | % Change<br>Emissions |
|-------------|-------------------------------|-------------------------------|-----------------------------------|-----------------------|
| Electricity | 132,638,035<br>kWh            | 147,399,865<br>kWh            | +11%                              | -12%                  |
| Natural Gas | 11,229,829<br>therms          | 11,862,481<br>therms          | +6%                               | +6%                   |
| Propane     | 5,625<br>MMBtu                | 5,363<br>MMBtu                | -5%                               | -5%                   |
| Total       | --                            | --                            | --                                | <b>-7%</b>            |

# Commercial

| Source      | 2005 Energy Consumption | 2011 Energy Consumption | % Change Energy Consumption | % Change Emissions |
|-------------|-------------------------|-------------------------|-----------------------------|--------------------|
| Electricity | 201,399,752 kWh         | 200,904,744 kWh         | 0%                          | -31%               |
| Natural Gas | 5,656,158 therms        | 6,266,896 therms        | +11%                        | +11%               |
| Total       | --                      | --                      | --                          | <b>-16%</b>        |

# Transportation

| Source            | 2005<br>Vehicle Miles<br>Traveled | 2011<br>Vehicle Miles<br>Traveled | % Change<br>Vehicle Miles<br>Traveled | % Change<br>Emissions |
|-------------------|-----------------------------------|-----------------------------------|---------------------------------------|-----------------------|
| Local Roads       | 228,887,565                       | 212,378,265                       | -7%                                   | -12%                  |
| State<br>Highways | 134,200,048                       | 122,725,091                       | -9%                                   | -13%                  |
| <b>Total</b>      | <b>363,087,613</b>                | <b>335,103,356</b>                | <b>-8%</b>                            | <b>-12%</b>           |



# Off-Road Vehicles & Equipment

| Source                    | 2005 Fuel Use  | 2010 Fuel Use  | % Change Fuel Use | % Change Emissions |
|---------------------------|----------------|----------------|-------------------|--------------------|
| Construction Equipment    | 231,440        | 159,394        | -31%              | -31%               |
| Lawn and Garden Equipment | 267,210        | 268,210        | 0%                | 0%                 |
| <b>Total</b>              | <b>498,650</b> | <b>427,604</b> | <b>-14%</b>       | <b>-13%</b>        |

# Water

| Source | 2005<br>Energy<br>Consumption | 2010<br>Energy<br>Consumption | % Change<br>Energy<br>Consumption | % Change<br>Emissions |
|--------|-------------------------------|-------------------------------|-----------------------------------|-----------------------|
| Water  | 6,711,604<br>kWh              | 5,988,426<br>kWh              | -11%                              | -31%                  |

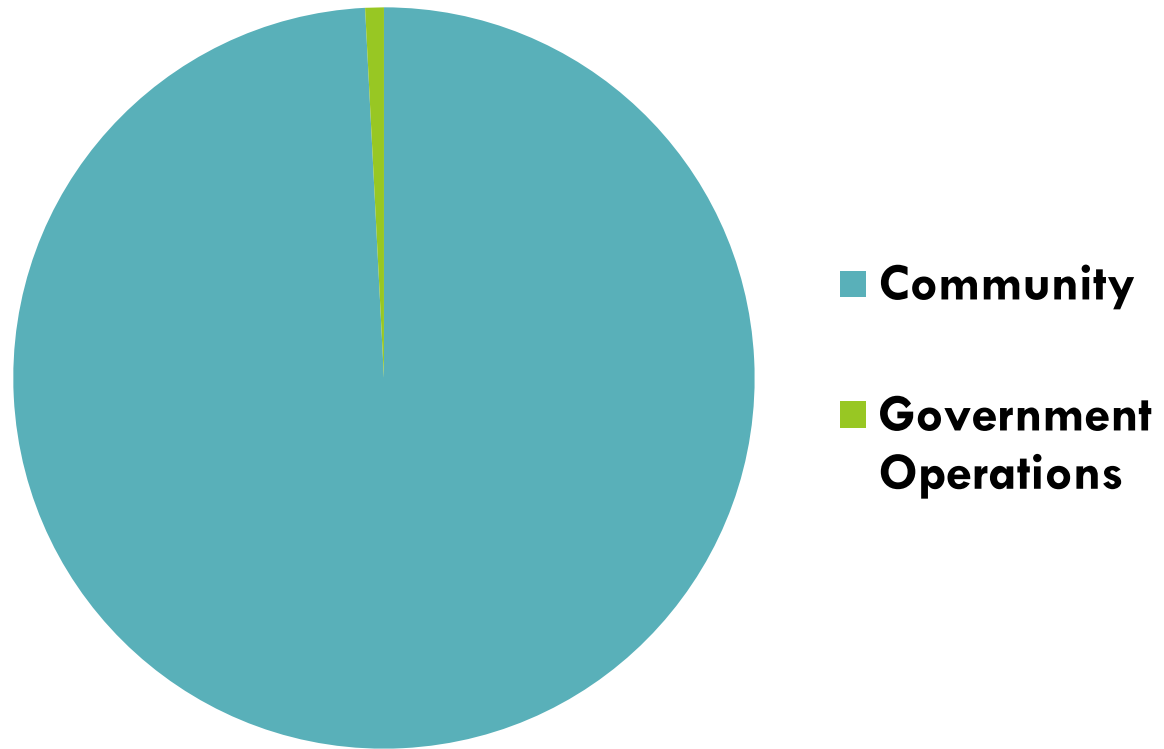
# Wastewater

| Source    | 2005 Emissions | 2010 Emissions | % Change Emissions |
|-----------|----------------|----------------|--------------------|
| Treatment | 1,479          | 1,517          | 3%                 |

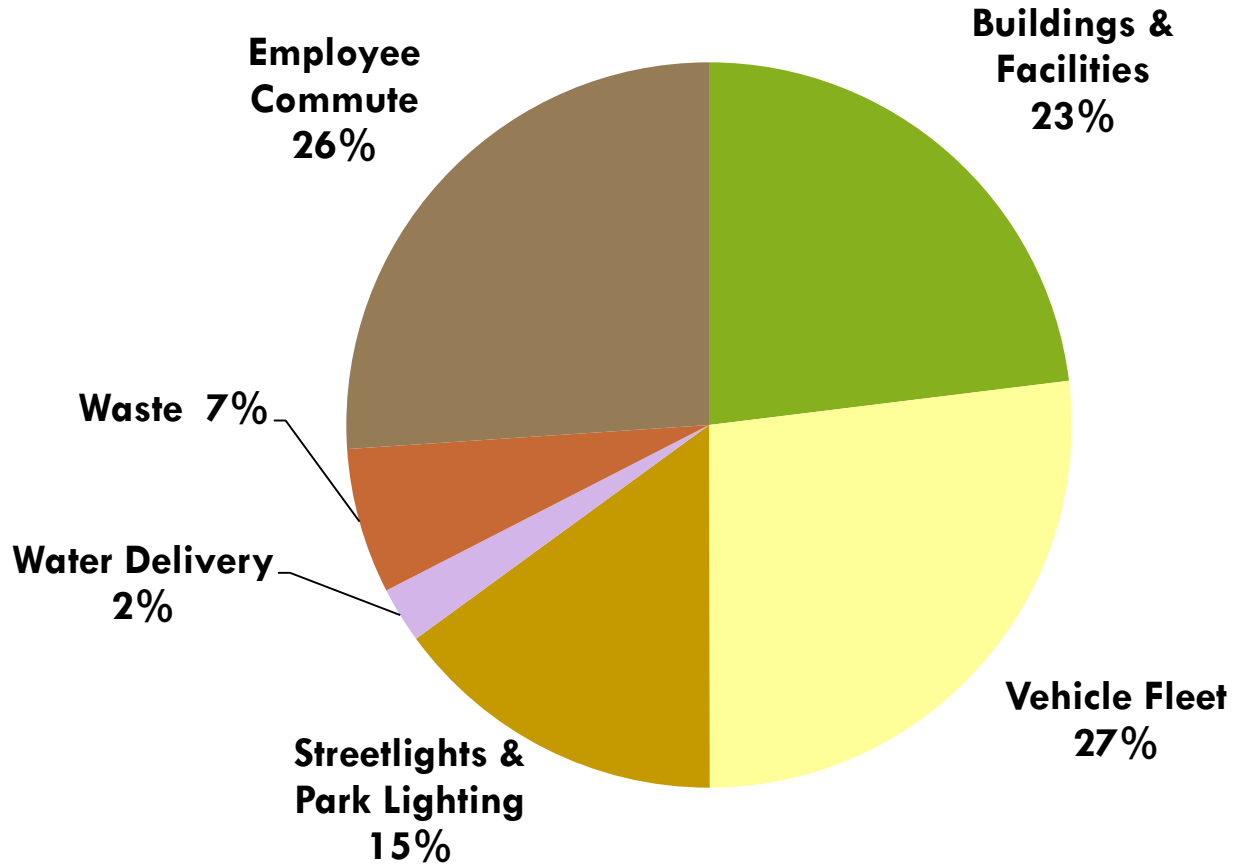
# Waste

| Source | 2005<br>Landfilled<br>Tons | 2011<br>Landfilled<br>Tons | % Change<br>Landfilled<br>Tons | % Change<br>Emissions |
|--------|----------------------------|----------------------------|--------------------------------|-----------------------|
| Waste  | 66,134                     | 44,335                     | -33%                           | -33%                  |

# Government Operations



# Government Operations 2010



# Government Operations 2005 vs. 2010

| Sector           | 2005         | 2010         | Change      | % Change    |
|------------------|--------------|--------------|-------------|-------------|
| Vehicle Fleet    | 934          | 862          | -72         | -8%         |
| Buildings        | 802          | 745          | -56         | -7%         |
| Public Lighting  | 615          | 485          | -130        | -21%        |
| Water Delivery   | 114          | 80           | -33         | -29%        |
| Waste            | 187          | 210          | 23          | 12%         |
| Employee Commute | 1,341        | 843          | -499        | -37%        |
| <b>Total</b>     | <b>3,993</b> | <b>3,225</b> | <b>-768</b> | <b>-19%</b> |

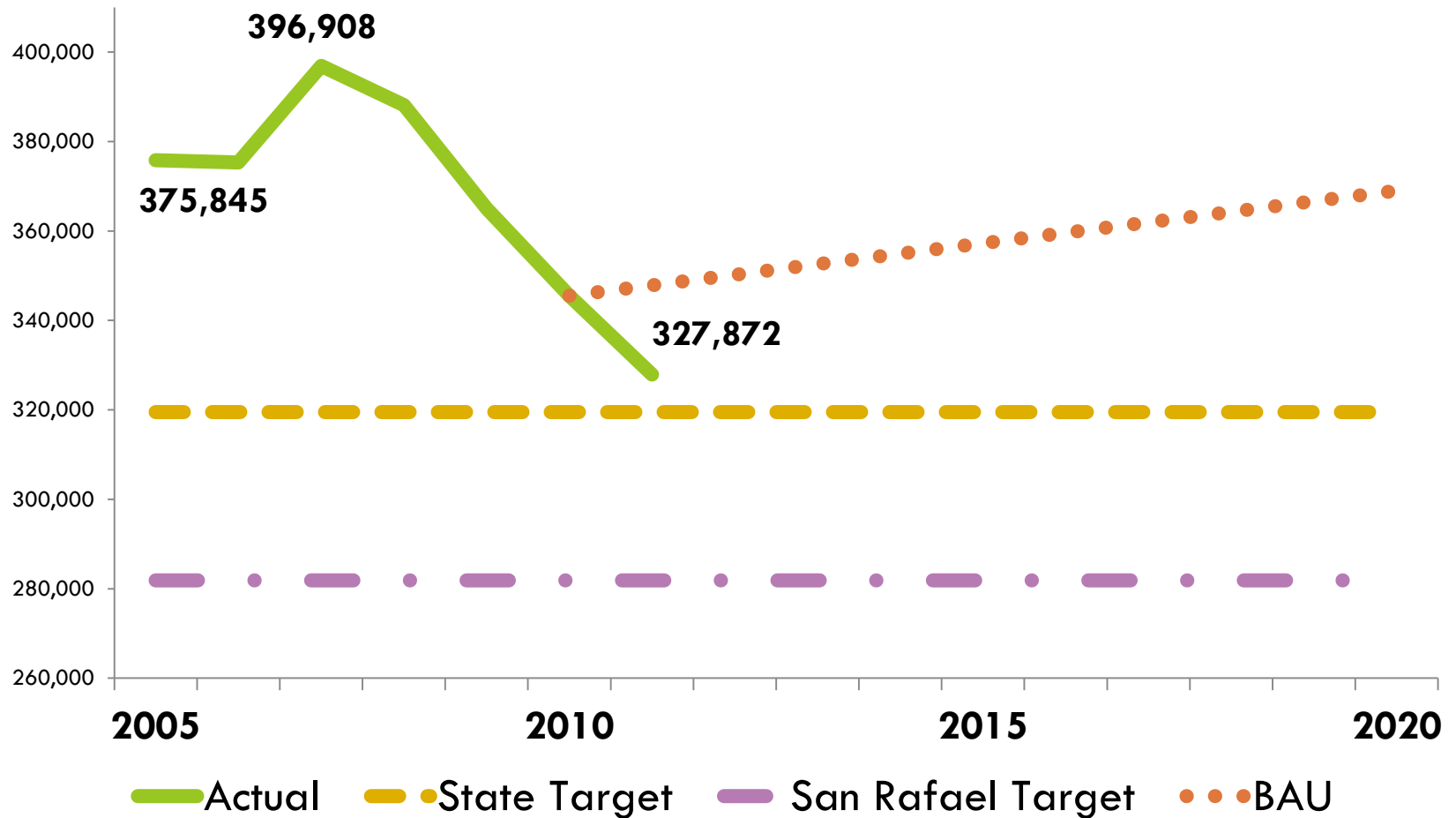
# Emissions Reduction Target



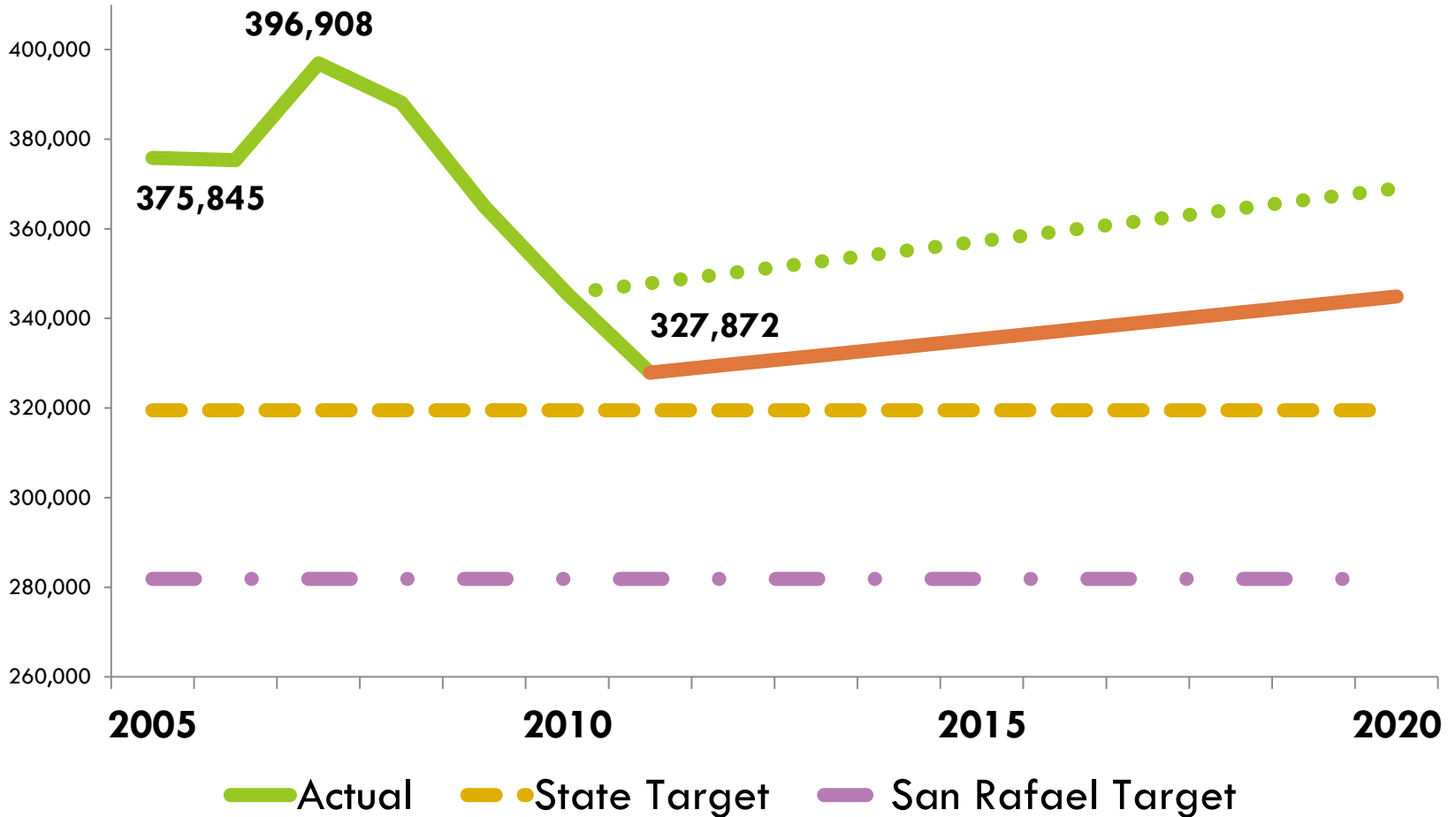
- Emissions reduced 19% between 2005 and 2010
- City's goal is 25% below 2005 level by 2020



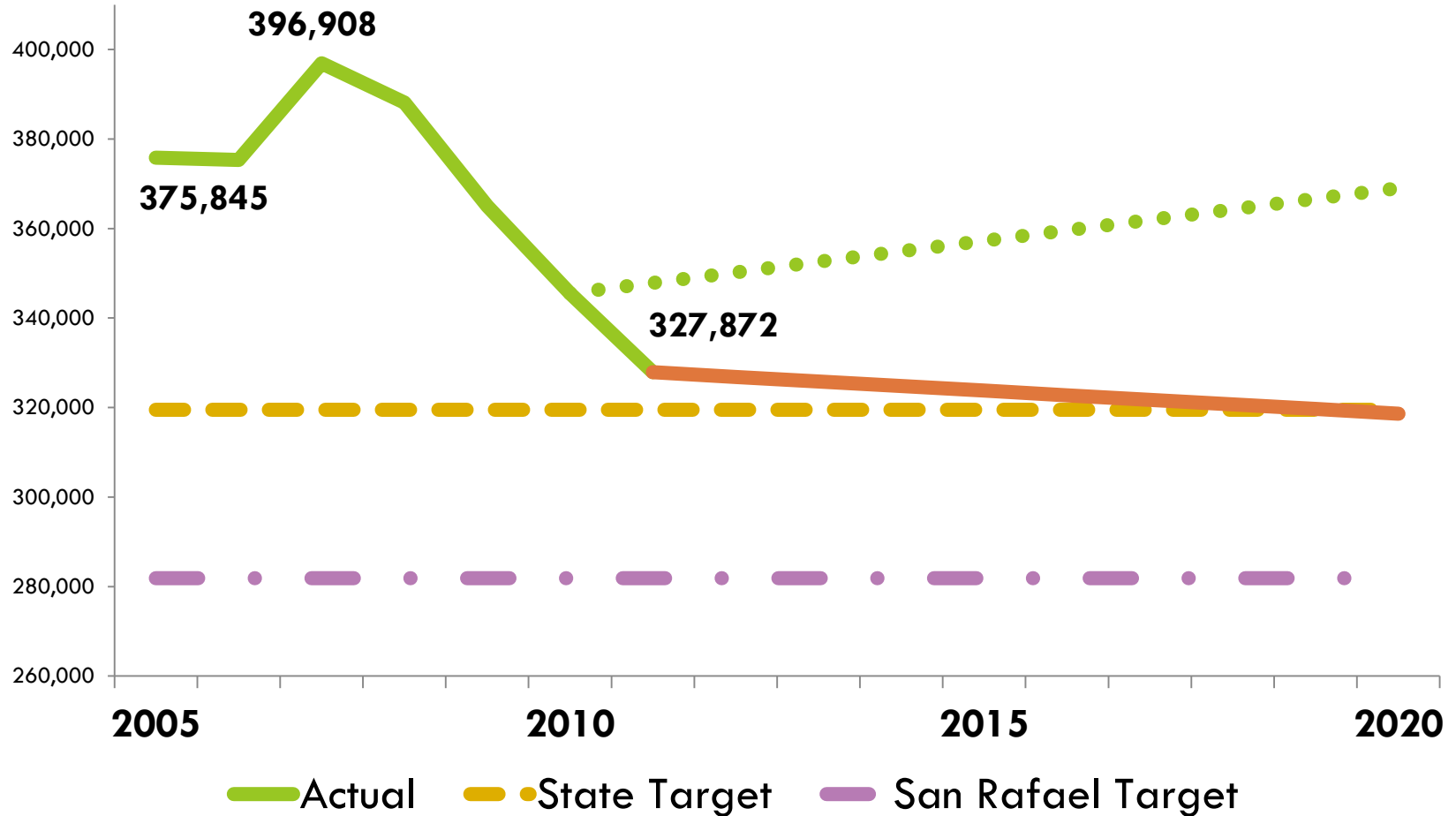
# Community Emissions Recap



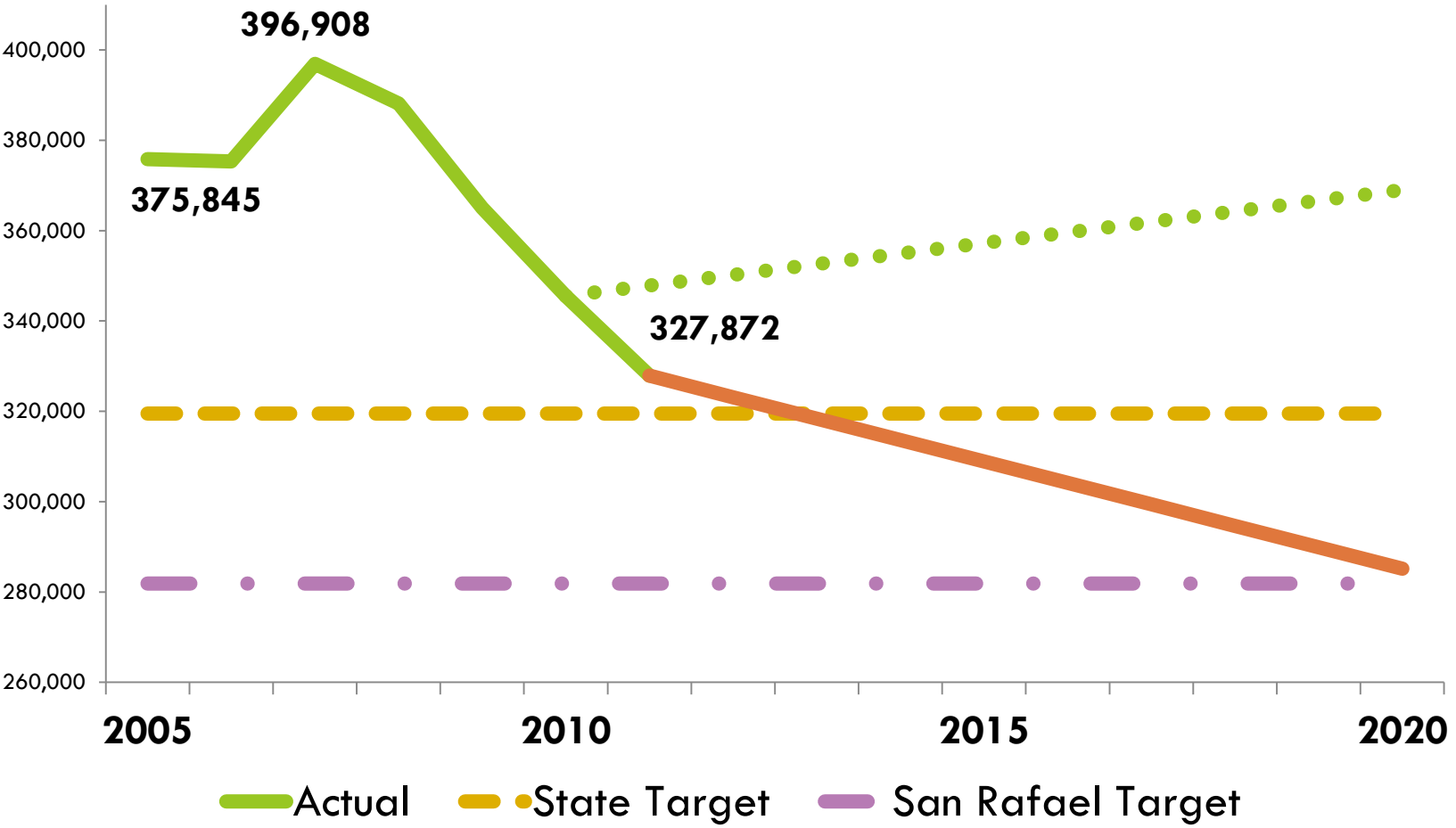
# MEA and Renewable Portfolio Standard



# Plus Pavley and Low Carbon Fuel Standard



# Plus Local Actions



# 2035 Compared to 2050 Target

