MEMORANDUM

DATE January 15, 2019

TO Andrea Chow, Sustainability Analyst, City of San Mateo

FROM Tammy L. Seale, PlaceWorks Project Manager
Benjamin Butterworth, Sustainability Consultant, DNV GL
Eli Krispi, , Climate Action Associate, PlaceWorks

SUBJECT Summary of Climate Action Plan Update Task 1 – Review and Preparation of Greenhouse Gas Emissions Inventories

This memo and the accompanying presentation prepared for staff and the Sustainability & Infrastructure Commission summarize the results of PlaceWorks-DNV GL team's first task of the Climate Action Plan (CAP) Update which was to review and update greenhouse gas emissions (GHG) inventories. This memo provides background for the task, a summary of the results, and key takeaways.

COMMUNITY-WIDE GHG INVENTORY BACKGROUND

As of September 2018, the City of San Mateo had seven community-wide GHG inventories covering the following years: 2005 and 2010 -2015. The PlaceWorks-DNV GL team identified three past inventories to show changes in GHG emissions since the baseline: the 2005 baseline inventory used in the 2015 CAP and the inventories for 2010 and 2015. The 2005 baseline inventory was originally developed by ICLEI and updated by PMC as part of the CAP development process in 2015. The City/County Association of Governments (C/CAG) provided 2010-2015 inventories for the City as part of the Regionally Integrated Climate Action Planning Suite (RICAPS) program. PMC also slightly revised the 2010 community GHG inventory as part of preparation of the 2015 CAP. While these revisions helped to improve the accuracy of the 2005 and 2010 community inventories for comparison to the 2015 inventory during preparation of the 2015 CAP, the revised methodology posed some challenges for "apples to apples" comparisons with regional inventories and a new 2017.

One of the primary goals of the CAP update project is to enable accurate comparisons across four community GHG inventories and regional inventories as feasible: 2005, 2010, 2015 and 2017. This will enable the City to track emissions reduction progress against the 2005 baseline. As a first step in the CAP update, the project team prepared a 2017 community inventory. In order to ensure accurate comparisons across all inventory years, it was important to identify and apply a consistent approach. To accomplish this goal, the project team adjusted the methods of past inventories and made sure all inventories are in compliance with guidance from the U.S. Community Protocol for

Accounting and Reporting of Greenhouse Gas Emissions - the method used to develop the 2017 community GHG inventory.

KEY CHANGES TO 2005, 2010 AND 2015 COMMUNITY GHG INVENTORIES

- Global Warming Potentials: In the past, IPCC Second Assessment Report (SAR) global warming potentials (GWPs) were used for all inventory years. The inventories have been updated to reflect the most recent GWPs available in the IPCC's Fifth Assessment Report (AR5).

- On-road Transportation: In the past, inventories utilized the "in-boundary" methodology for estimating vehicle miles travelled (VMT) in San Mateo. This methodology includes all VMT that occur within the city boundary, including pass-through traffic, regardless of trip origin or destination. The "origin-destination" methodology has been determined to be a more accurate representation of VMT in a city, and, as a result, the inventories were updated to utilize this methodology. The "origin-destination" VMT methodology only accounts for vehicle trips that begin and/or end within the city boundary.

- Off-road Equipment: The California Air Resources Board (CARB) OFFROAD2007 model estimates total emissions from all off-road equipment in a given year at a county level. In the past, inventories assigned emissions from all equipment categories included in this model to the City. However, it was determined to be more accurate to exclude emissions from certain equipment types (e.g. oil drilling, agricultural equipment) that were not relevant to the City. Additionally, County-level off-road construction equipment emissions had previously been allocated to the City using the percent of total County jobs in the City. It was determined to be more accurate to assign off-road equipment emissions to the City using the percent of year-to-year County-level service population change attributable to the City (e.g. if the County service population increased 1,000 in one year and the City service population increased 100 in that same year, 10% of the County's off-road construction equipment emissions would be allocated to the City).

- Direct Access Electricity: In the past, data on total electricity consumption associated with direct access customers in San Mateo was not available from PG&E. Historically, direct access electricity consumption was estimated based on County-level direct access electricity consumption data. In recent years, city-by-city direct access electricity consumption data has become available and the inventories were updated to reflect this.

KEY TAKEAWAYS

Emissions in 2017 were 541,960 MT CO_2e. This represents an 18.0% decrease from 2005 baseline levels of 660,600 MT CO_2e. This puts the City on track to achieve the State's Assembly Bill (AB) 32 target of a 15% reduction below 2005 emissions levels by 2020. Additionally, total emissions have decreased 8.3% from 2015 (prior to launch of Peninsula Clean Energy) to 2017 (after the launch of

PCE). Revisions to the 2005, 2010 and 2015 inventories have enabled the City to make accurate comparisons across inventory years and track progress towards the State's AB 32 goal. The results of the inventories are presented in Table 1 below and the attached presentation.

Table 1: Emissions by Sector, 2005-2017

Sector		2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$
Residential electricity		45,990	43,040	35,420	19,650
Residential gas		90,690	93,550	73,770	78,080
Nonresidential electricity		92,100	80,930	67,620	29,440
Nonresidential gas		49,860	50,670	51,880	56,400
Stationary sources		7,390	7,390	11,610	14,230
On-road transportation		282,370	287,550	280,570	269,110
Off-road equipment		55,780	53,720	41,470	45,030
Solid waste disposal		22,180	16,580	15,860	17,890
Other sectors	Landfill	7,370	6,670	6,030	5,800
	Rail	4,350	4,480	4,410	4,520
	Water use	1,430	1,240	870	840
	Wastewater treatment	1,090	1,130	1,350	960
Total		660,600	646,960	590,850	541,960

Due to rounding, the totals may not equal the sum of the parts.

The number of residents, households, and jobs in San Mateo help inform how GHG emissions have changed in relation to the community's demographics. (Refer to Table 2) This demographic information was also necessary to allocate a portion of County-level off-road equipment emissions to San Mateo.

The job numbers shown here differ somewhat from the numbers presented in the Existing Conditions reports for San Mateo's ongoing General Plan update. While both sets of numbers come from the same source, the numbers used for the Existing Conditions reports have been adjusted in

a way that could not be replicated as part of the GHG inventory, so the unadjusted numbers have been used. Projections of future demographics in the CAP will be consistent with the General Plan.

Table 2: Demographic Indicators, 2005-2017

Demographic indicator	2005	2010	2015	2017	Source
Population	93,400	97,110	101,610	103,470	California Department of Finance
Households	37,980	38,240	38,410	38,950	California Department of Finance
Jobs	40,940	39,370	60,500	63,200	California Employment Development Department and US Census Bureau
Service population	134,340	136,480	162,110	166,670	Calculated (population plus jobs)

NEXT STEPS

The consultant team will prepare a business-as-usual forecast and begin quantification of state and regional policies, programs, and projects that have local GHG reduction benefits. We will rely on the SB 32 Scoping Plan prepared by the Air Resources Board to identify state actions.

ATTACHMENT

- Presentation for Sustainability & Infrastructure Commission

San Mateo Climate Action Plan Update

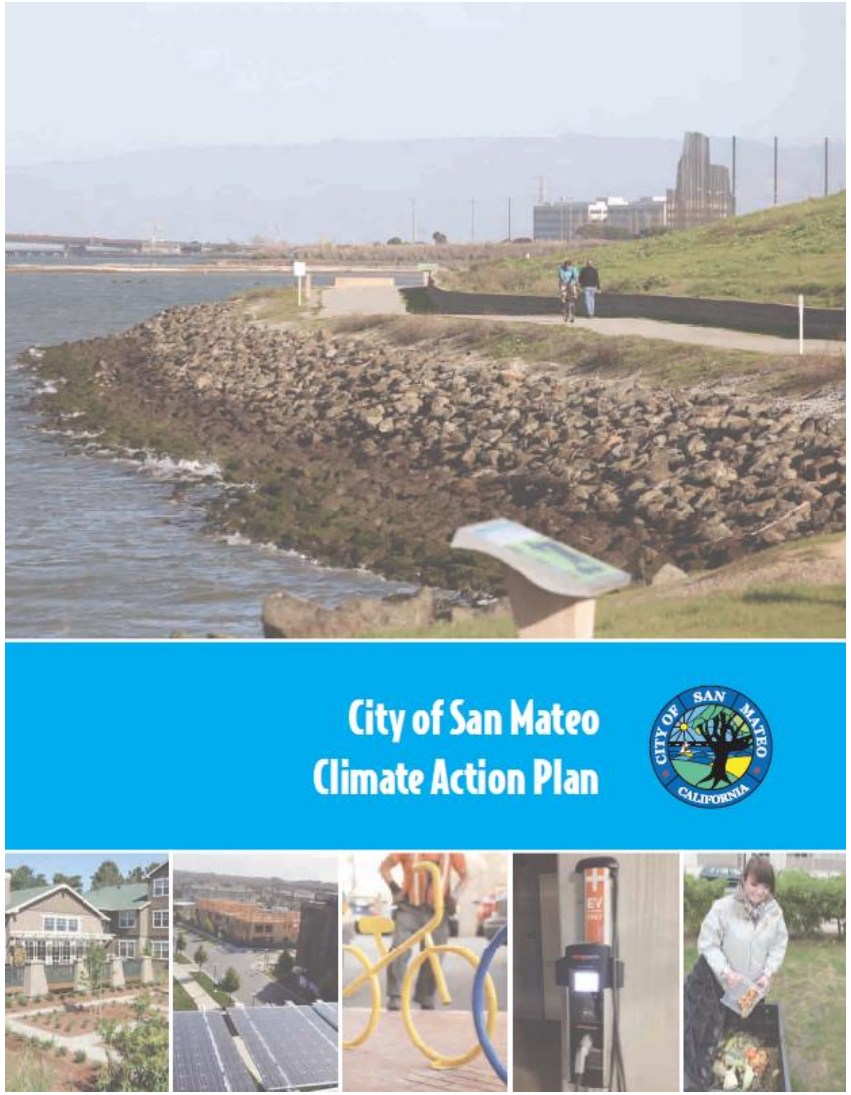
Sustainability and Infrastructure Commission | January 9, 2019

Who We Are

- Andrea Chow
  - Sustainability Analyst, City of San Mateo
- Tammy Seale
  - Principal in Charge and Project Manager, Climate Action and Resiliency Services, PlaceWorks
- Eli Krispi
  - Assistant Project Manager, Climate Action and Resiliency Services, PlaceWorks

Why Update the CAP?

- Current CAP was adopted in 2015
  - Reduces emissions to meet 2020 target.
- Need to stay consistent with State law.
- CAP does not meet long-term GHG targets.
- Build on City's recent CAP implementation successes.
- Integrate with General Plan update.



Integration with General Plan

- CAP will connect with General Plan.
  - Incorporate sustainability throughout General Plan.
  - Ensure General Plan policies support GHG reductions.
- PlaceWorks is General Plan Update prime consultant.
  - CAP will be finished before General Plan.

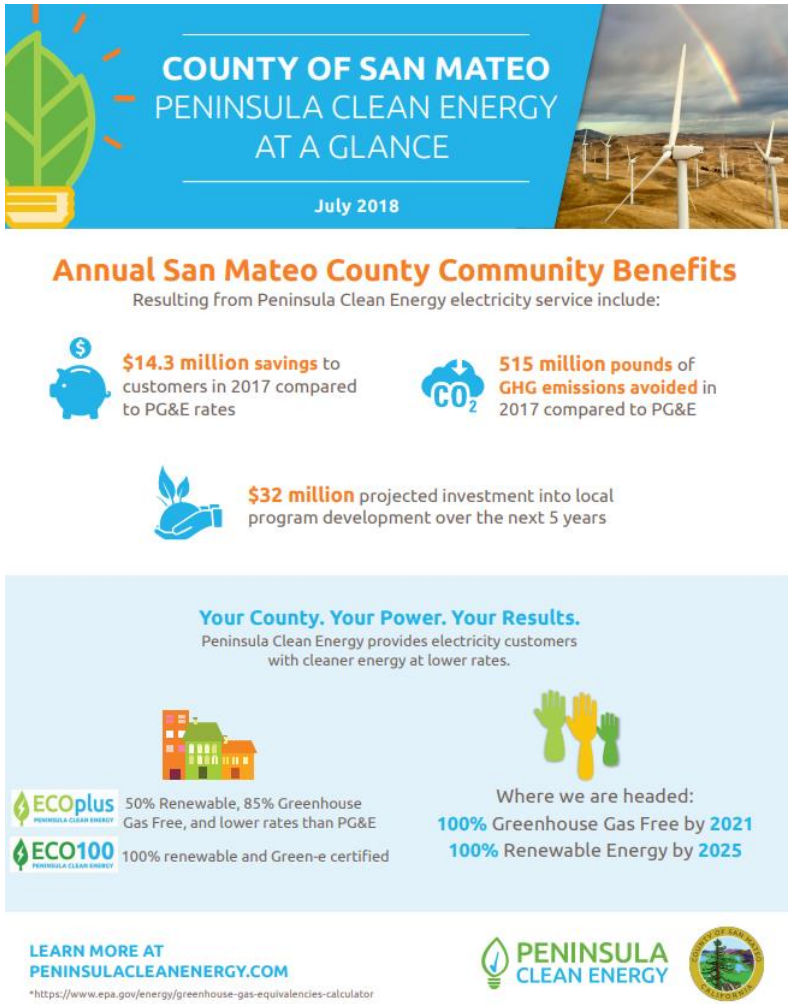
STRIVE SAN MATEO
GENERAL PLAN 2040

GHG Inventory

- Measurement of emissions that are attributed to San Mateo in a single calendar year.
  - Shows baseline emissions, to measure change against.
  - Shows interim emissions, to measure progress since baseline.
- Identifies major sources (sectors) of emissions.

Why Update the Inventory?

- Need to stay consistent with current science.
- Ensure inventories are consistent with RICAPS.
- Prepare 2017 inventory.
  - Impact of PCE and other recent policies.

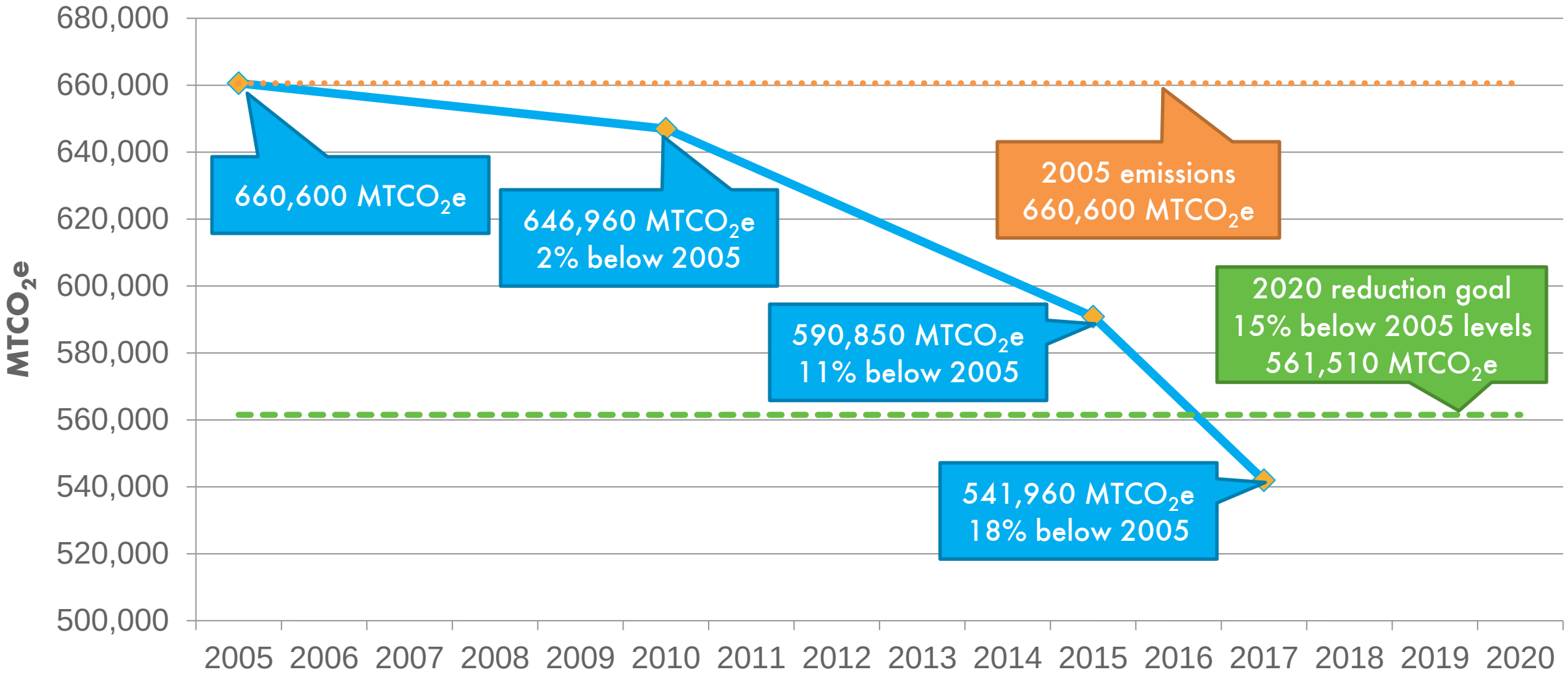


GHG Inventory Update – 2005 Baseline and 2017

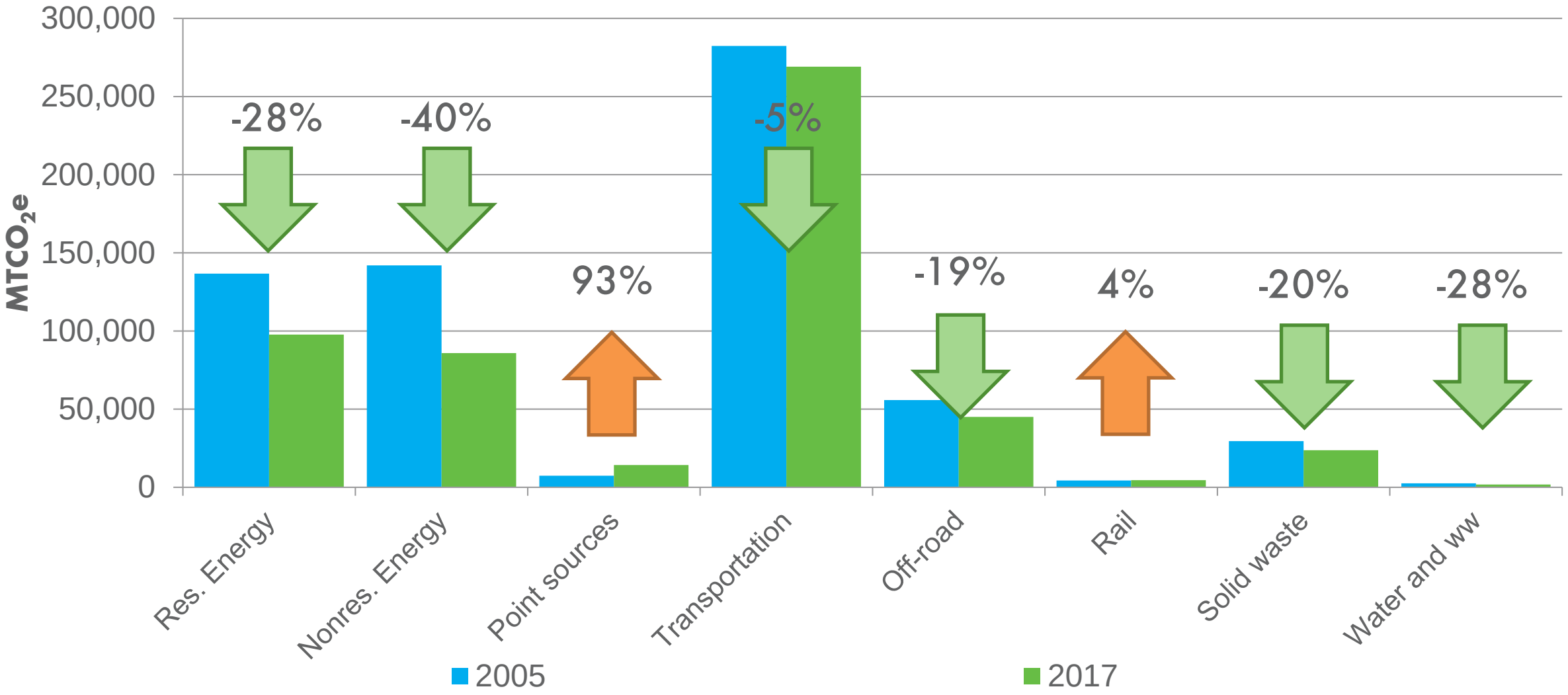
- Changes to VMT method.
- Expanded off-road category.
- Freight trains added.
- Minor method changes.

Sector	2005 $MTCO_2e$ (Adopted CAP)	2005 $MTCO_2e$ (Updated)	2017 $MTCO_2e$
On-road transportation	464,070	282,370	269,110
Commercial/industrial built environment	144,790	141,960	85,840
Residential built environment	136,790	136,690	97,730
Solid waste generation	26,960	29,550	23,680
Off-road equipment	11,690	55,780	45,030
Point sources	6,070	7,390	14,230
Rail	3,870	4,350	4,520
Water and wastewater	3,030	2,520	1,810
Total	**804,290**	**660,600**	**541,960**

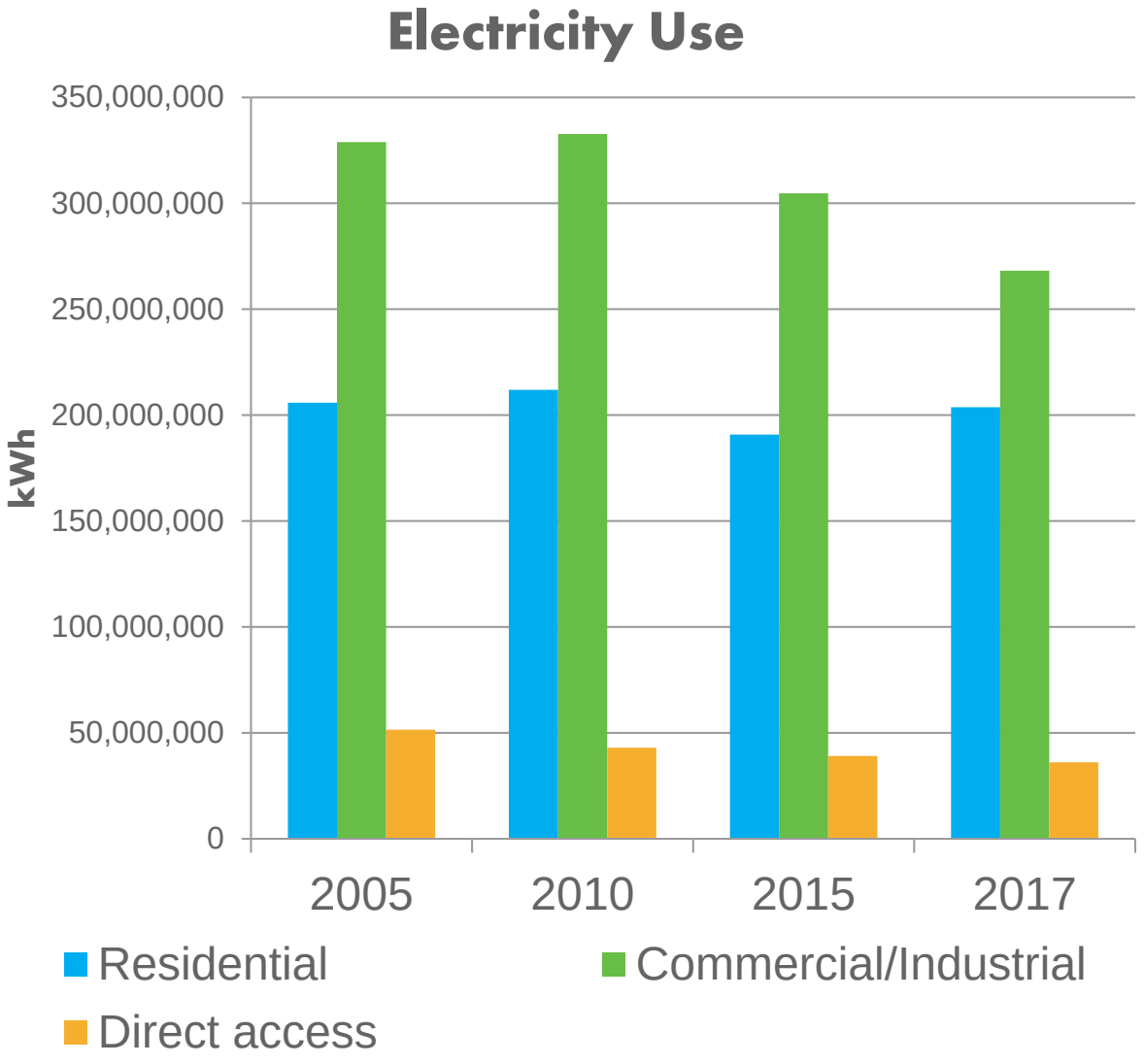
GHG Emissions Trends: 2005 - 2017

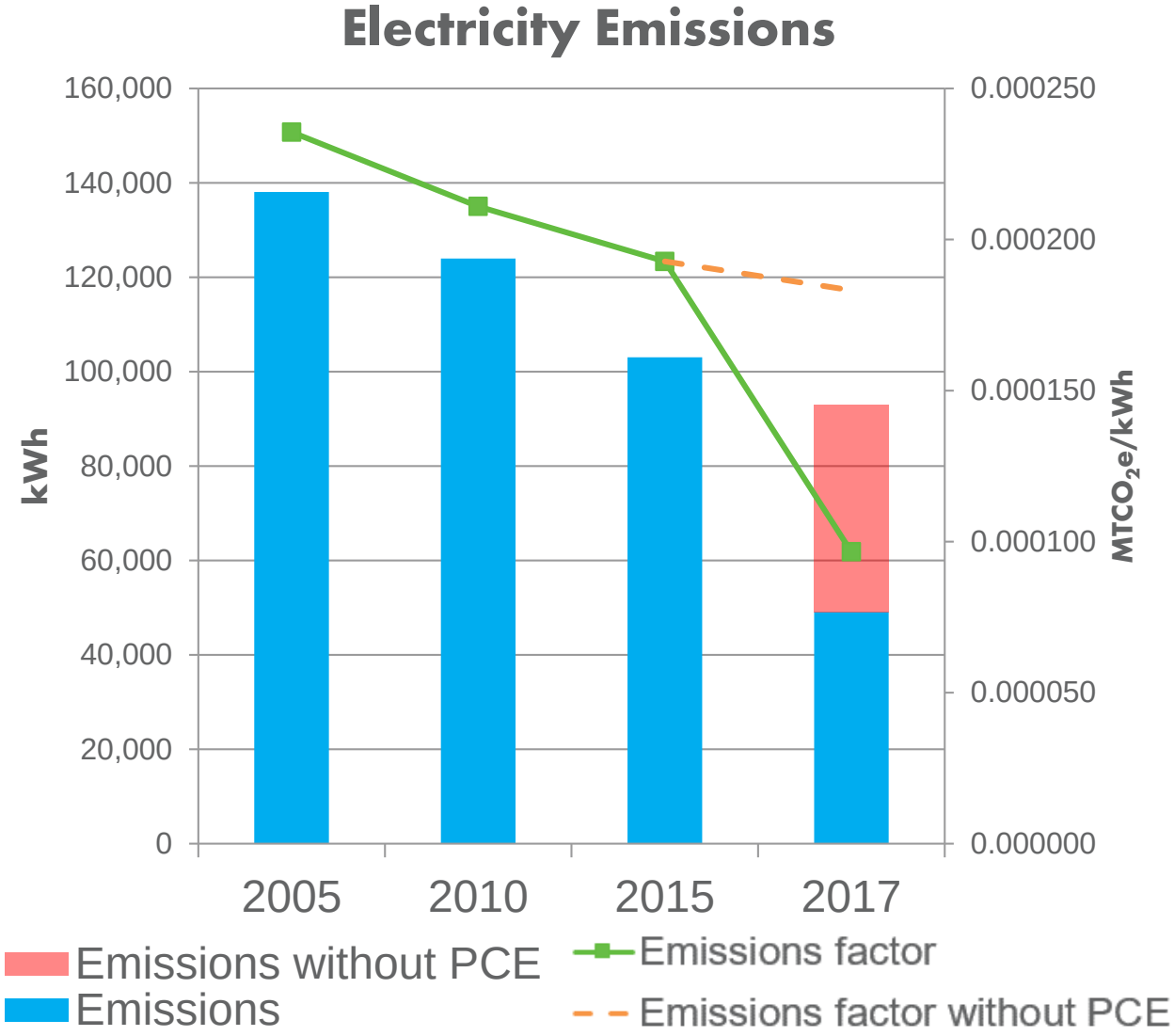


GHG Emissions by Sector: 2005 and 2017

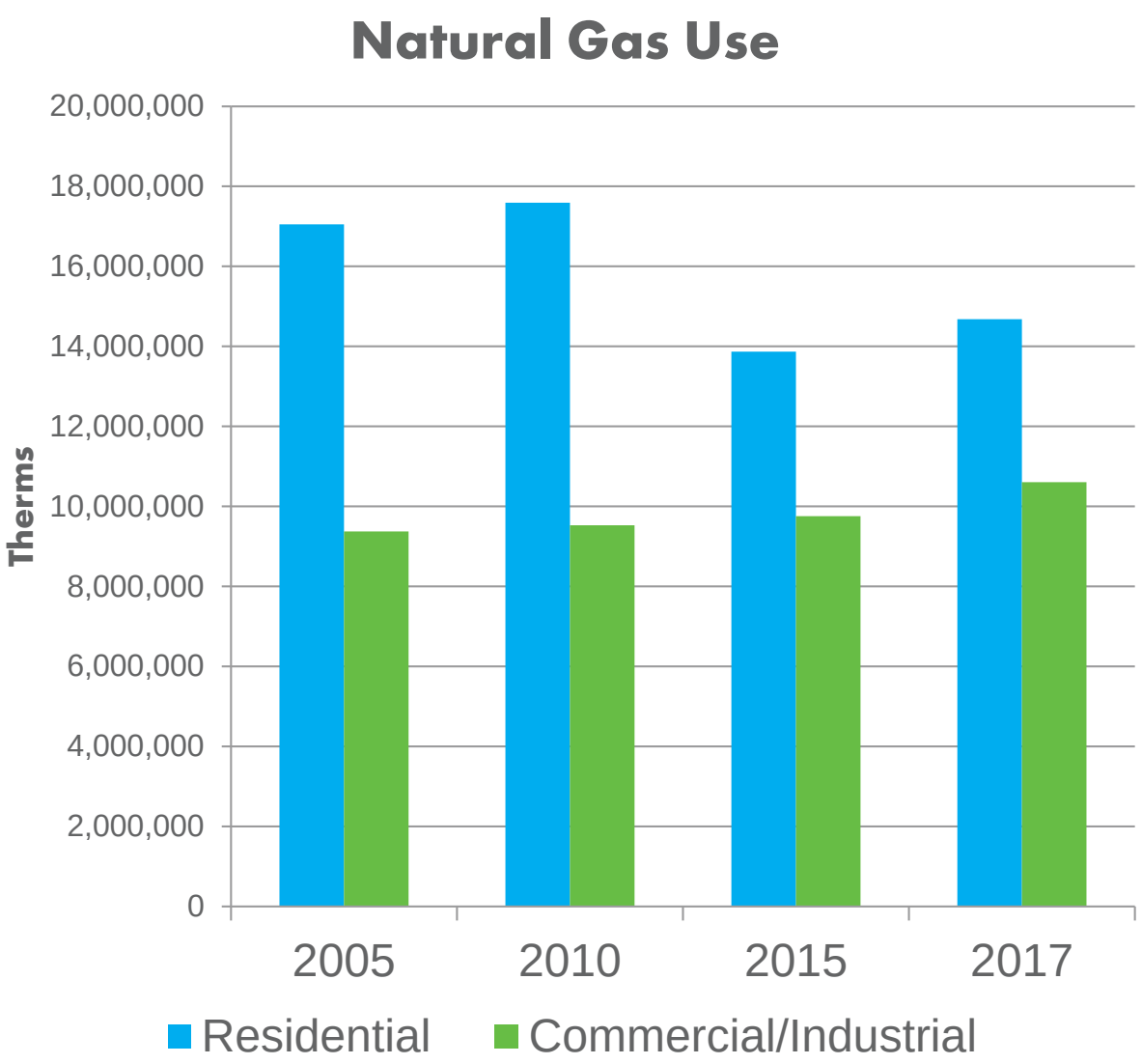


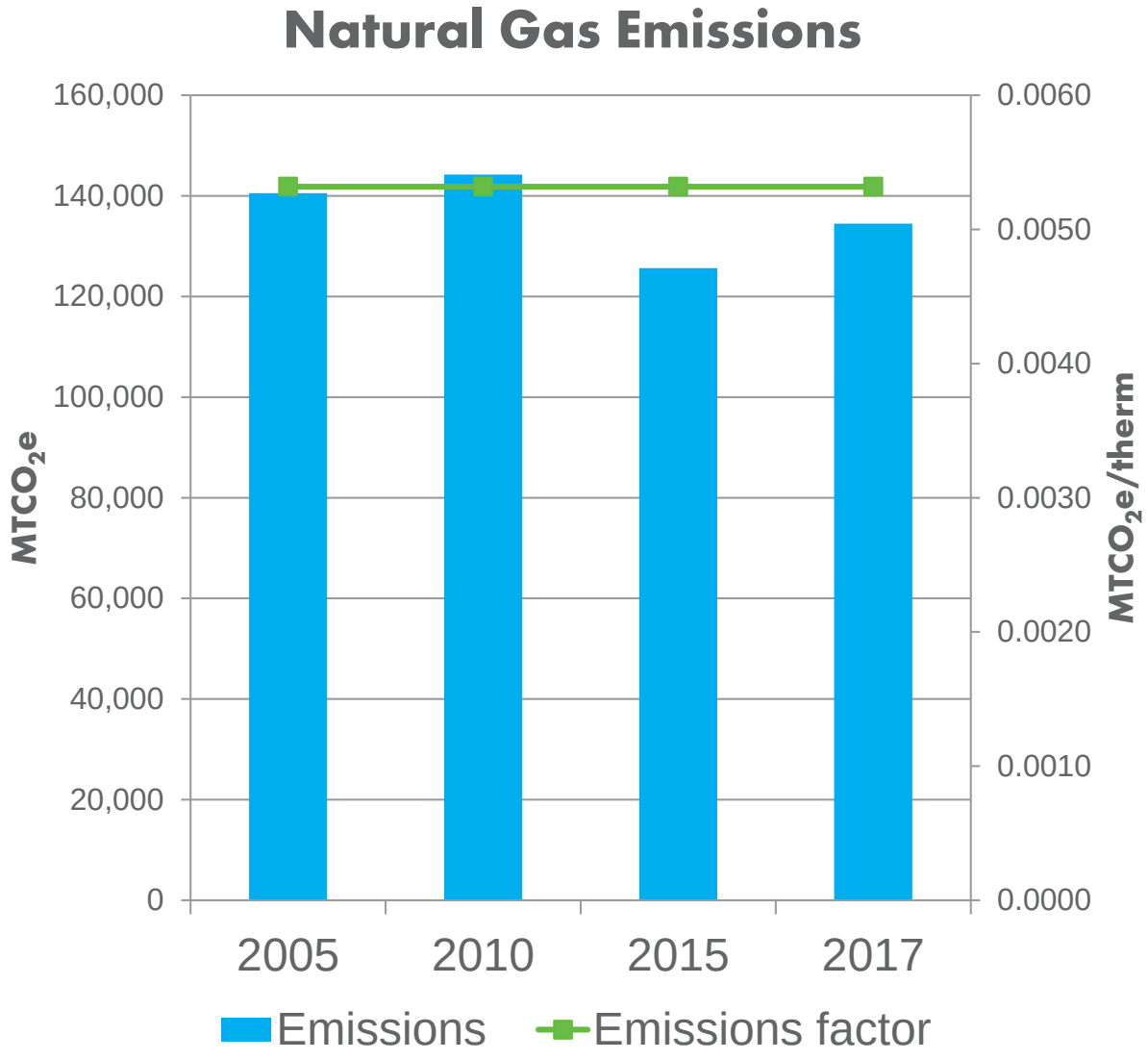
Electricity Trends: 2005 - 2017



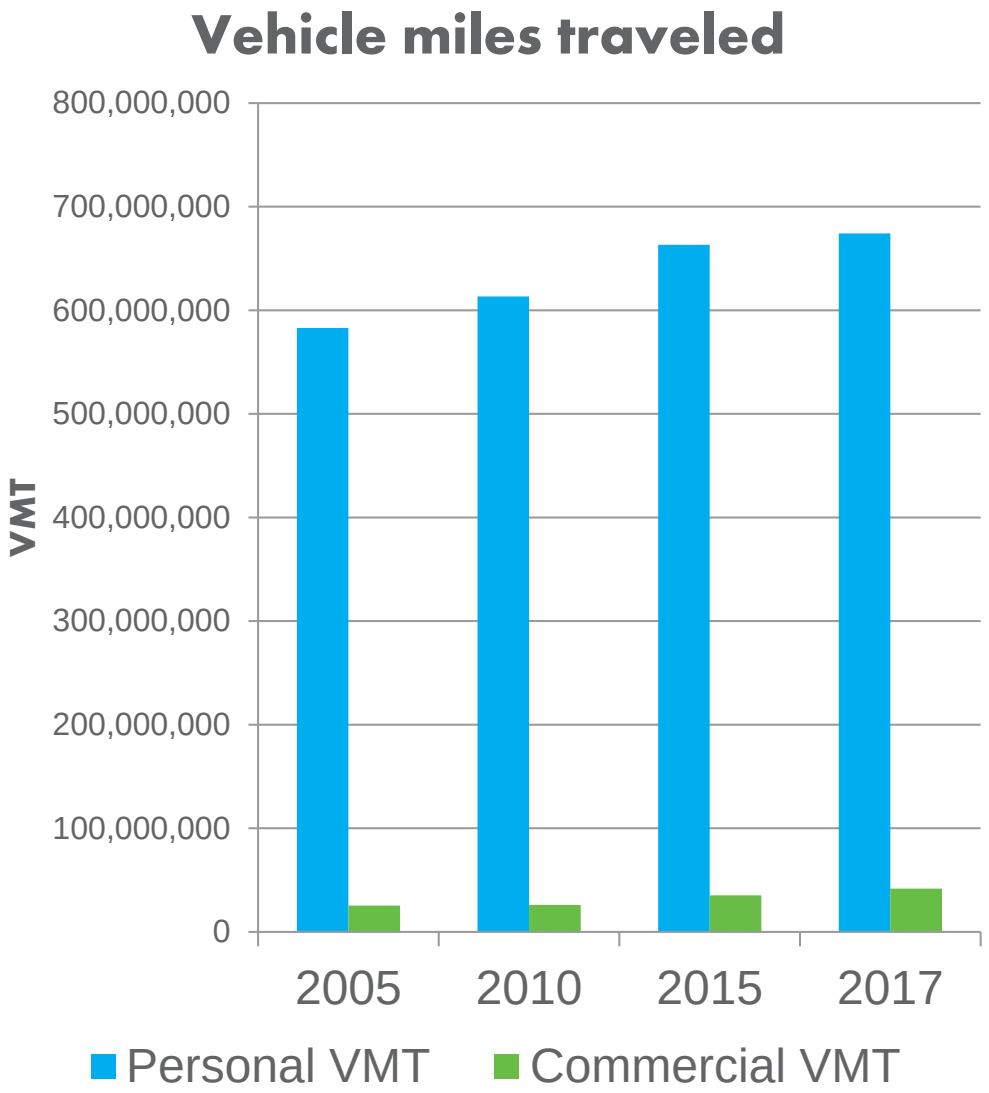


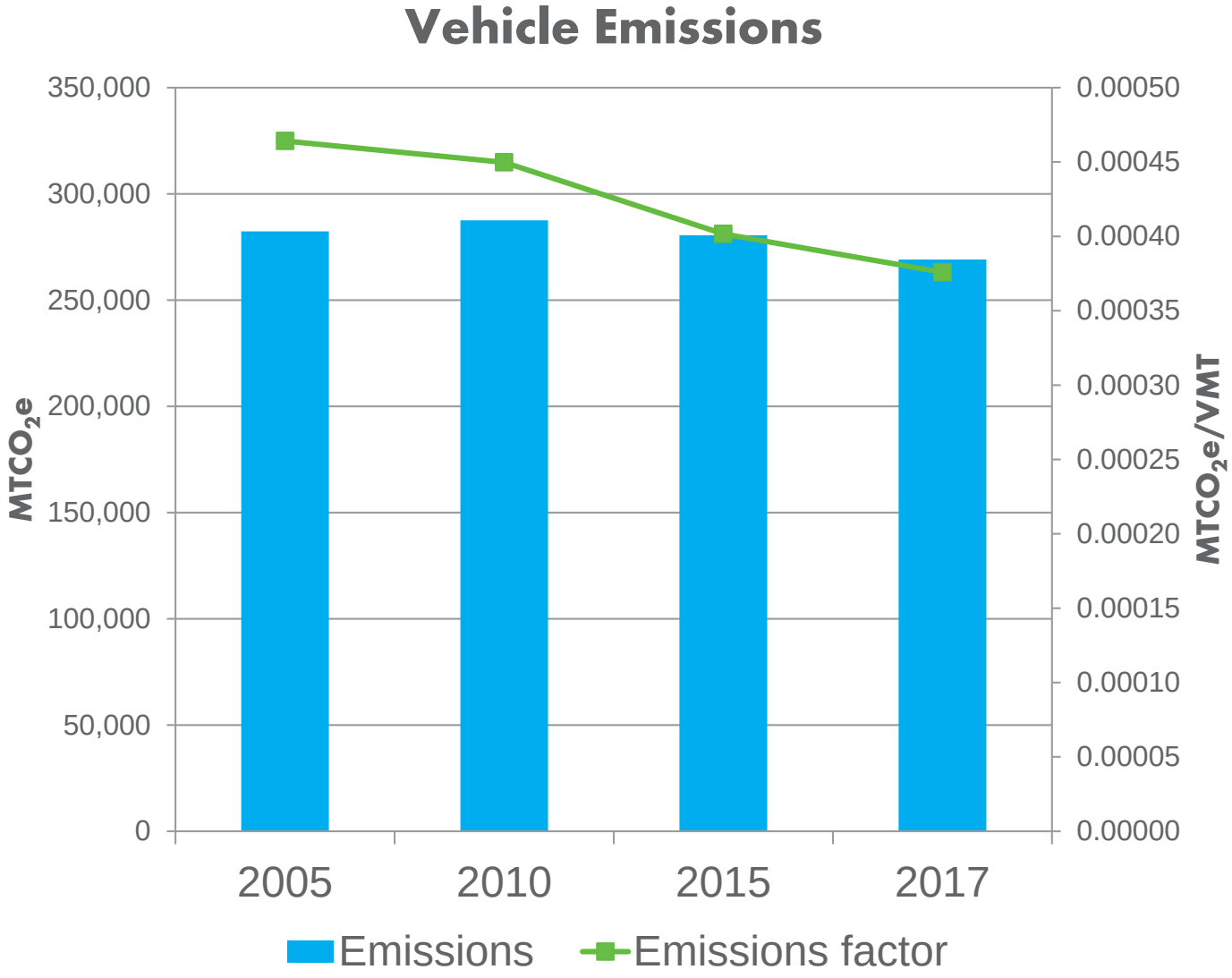
Natural Gas Trends: 2005 - 2017



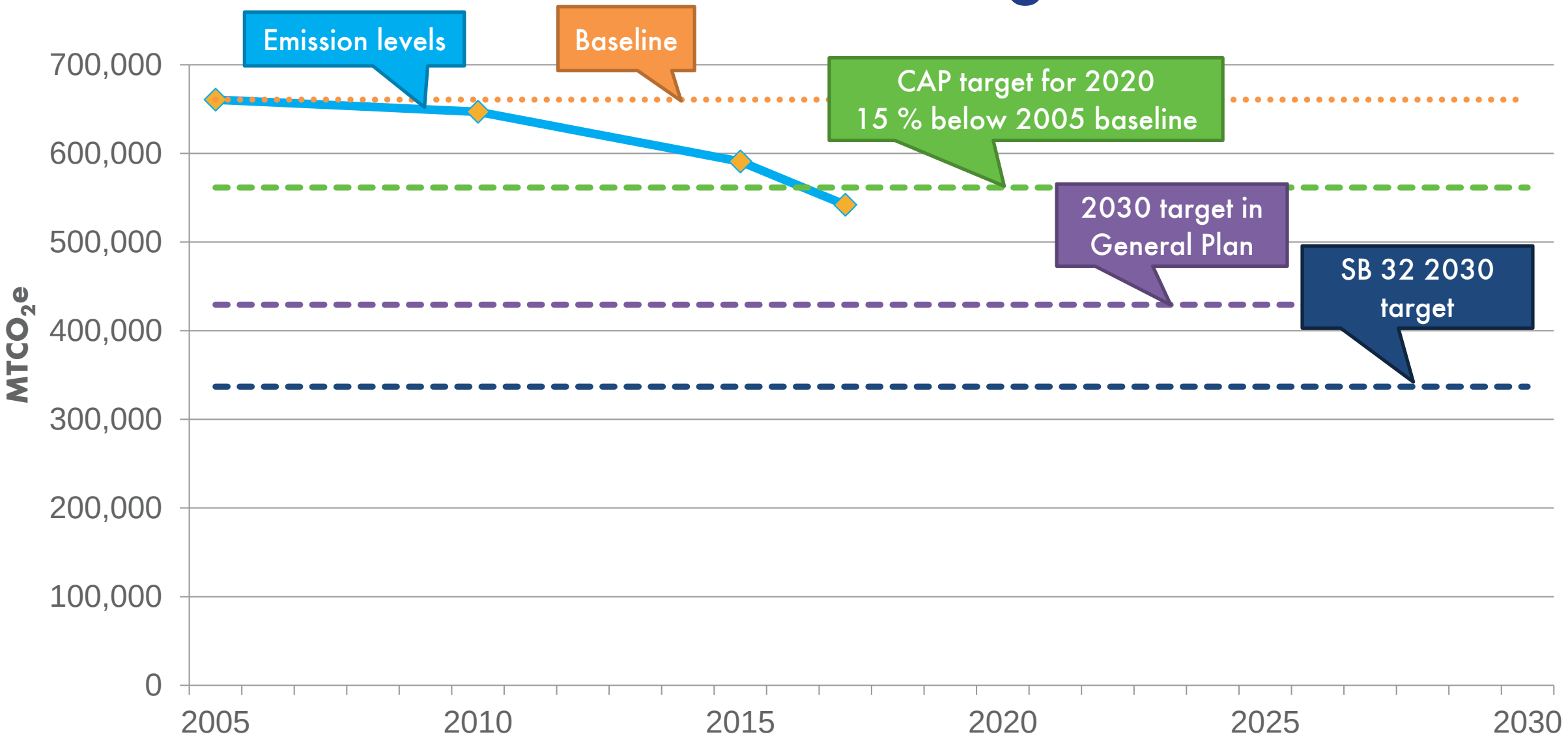


On-Road Transportation Trends: 2005 - 2017





GHG Emissions and Reduction Targets



Next Steps

- Forecast GHG emissions.
- Assess effects of existing and planned state, regional, and local policies.
- Develop GHG reduction strategies.
- Engage community.

Next Meetings

Date	Topics
March 13	Present reductions from existing efforts, review forecast and reduction targets, and discuss GHG reduction measures.
April 10	Continue discussion of GHG reduction measures.
July 10	Present updates on community engagement, and finalize GHG reduction measures and implementation program.
October 19	Review draft CAP and issue recommendation to City Council.

Questions?