Midpeninsula Regional
Open Space District

R-18-67
Meeting 18-27
June 27, 2018

STUDY SESSION AGENDA ITEM 1

AGENDA ITEM

Greenhouse Gas Reduction Goals

GENERAL MANAGER'S RECOMMENDATION

Receive informational presentation and provide feedback to staff on developing a draft Climate Action Plan based on one of the following greenhouse gas reduction goals:

- State of California goal (staff recommendation): 40% below baseline by 2030, 80% below baseline by 2050
- More aggressive goal: 100% reduction by 2050
- Less aggressive goal: 80% below *per-employee* baseline by 2050

SUMMARY

The purpose of this study session is for the Board to receive an informational presentation and provide feedback to staff on the potential greenhouse gas (GHG) reduction goals the draft Climate Action Plan could be based on. This feedback is needed before staff can develop a draft Climate Action Plan because the scale of the plan is determined by the scale of the underlying GHG reduction goal. Project consultants will present the rationale and some example strategies and costs for reaching the State of California's goal, as well as a more aggressive goal option and a less aggressive goal option. Based on Board feedback, staff will develop a draft Climate Action Plan and draft Climate Change Policy for Board review at the September 12, 2018 study session. The Board will formally set the District's GHG reduction goal as part of the Climate Change Policy, adopted concurrently with the Climate Action Plan.

DISCUSSION

Staff and project consultants from Cascadia Consulting Group will provide an informational presentation and facilitate a Board discussion on the District's GHG reduction goal. The presentation will begin with a refresher on the District's current and forecasted GHG emissions (see Attachment 1, Midpen Greenhouse Gas Inventory Report) and background information on peer agencies' GHG reduction goals.

GHG Reduction Goal Scope

Staff recommends an **administrative scope** for the District's GHG reduction goal that includes emissions associated with the administration of the District: vehicles, maintenance equipment, facilities, employee commuting, and tenant residences. Staff recommends excluding livestock emissions from the scope of the GHG reduction goal based on the Board's comments at the March 28, 2018 meeting (R-18-28) that livestock serve a very different function than vehicles

and facilities, provide environmental and community benefits, and exist within a complex biological system. Strategies to offset livestock emissions will still be included in the Climate Action Plan, and livestock emissions will be tracked in the District's annual GHG Inventory. In addition, the Board noted that visitor transportation to preserves is likely a large source of GHG emissions that the District has limited control over. Like livestock, visitor transportation emissions will be assessed and tracked in future years' GHG Inventories.

There is precedent from other agencies, such as Golden Gate National Recreation Area and Point Reyes National Seashore, for using multiple scopes for setting GHG reduction goals and tracking emissions. Both agencies have an administrative GHG reduction goal, and then for more challenging emissions sources like livestock and visitor transportation, they still track emissions and identify GHG reduction strategies for those sources in their Climate Action Plans.

Finally, separate GHG reduction goals could be adopted for livestock and/or visitor transportation in the future as staff completes more research and analysis on those sectors. For example, the Climate Action Plan will likely recommend further study on livestock, including the extent to which soil carbon sequestration could be increased to offset emissions. A more complete understanding of these emissions sources and potential solutions would allow the Board to set supplementary GHG reduction goals in the future that are realistic and achievable.

GHG Reduction Goal Options

Staff recommends developing the draft Climate Action Plan based on the State of California's GHG reduction goal. Project consultants will present three options for GHG reduction goals:

- State of California goal (staff recommendation): 40% below baseline by 2030, 80% below baseline by 2050
- More aggressive goal: 100% reduction by 2050
- Less aggressive goal: 80% below *per-employee* baseline by 2050

For each of the three GHG reduction goal options, the consultants will present pros and cons of the goal and some example strategies and costs for reaching the goal. These examples are intended to provide a high-level picture of what would be required to reach each goal option. Staff will present more holistic and refined cost estimates as part of the draft Climate Action Plan at the September 12, 2018 study session. A memo listing potential GHG reduction strategies that will be analyzed for the draft Climate Action Plan can be found in Attachment 2.

FISCAL IMPACT

There is no fiscal impact associated with this study session. There are sufficient funds in the FY17-18 budget for Climate Action Plan development to date. The FY18-19 budget contains sufficient funds to complete the Climate Action Plan. Staff will present fiscal impacts associated with implementing the Climate Action Plan at the September 12, 2018 study session when the Board reviews the draft Climate Action Plan and draft Climate Change Policy. Implementation funding will be subject to Board approval and direction.

BOARD COMMITTEE REVIEW

No Committee review has occurred on this project.

PUBLIC NOTICE

Public notice was provided as required by the Brown Act.

CEQA COMPLIANCE

This item is not a project subject to the California Environmental Quality Act.

NEXT STEPS

The Board will review the draft Climate Action Plan and draft Climate Change Policy at a study session on September 12, 2018. Staff will incorporate Board feedback and bring a revised Climate Action Plan and Climate Change Policy to the Board for adoption in October 2018.

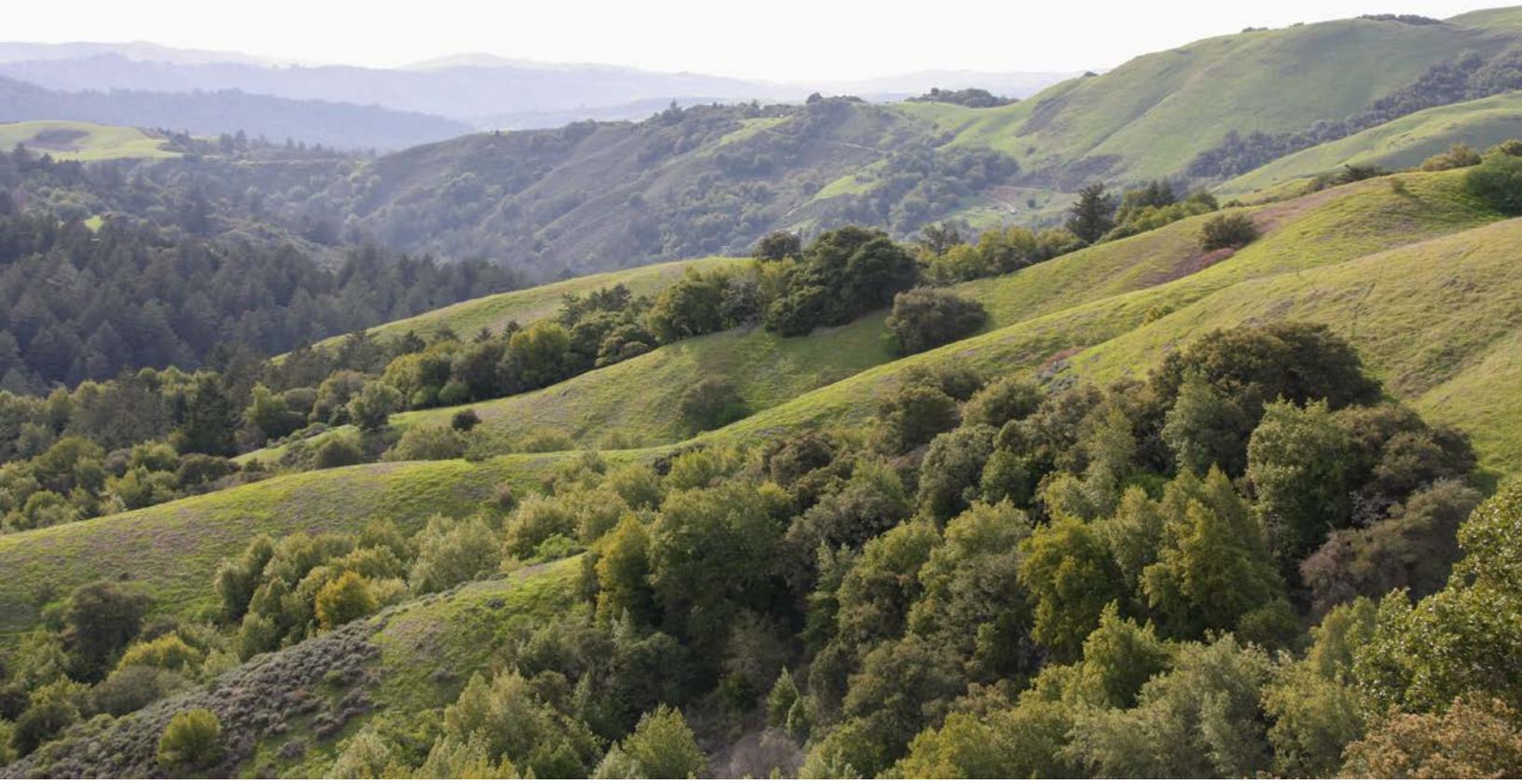
Attachments
1. Midpen Greenhouse Gas Inventory Report
2. Potential Greenhouse Gas Reduction Strategies Memo

Responsible Department Head:
Kirk Lenington, Natural Resources

Prepared by:
Hayley Edmonston, Climate Resiliency Fellow, Natural Resources

Contact person:
Hayley Edmonston, Climate Resiliency Fellow, Natural Resources

Attachment 1



MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GREENHOUSE GAS INVENTORY REPORT

04.13.2018 REVISED DRAFT

MIDPENINSULA REGIONAL OPEN SPACE

CASCADIA CONSULTING GROUP

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

GREENHOUSE GAS INVENTORY REPORT

03.14.2018 DRAFT

Background and Key Objectives

In 2017, the Midpeninsula Regional Open Space District ("District") initiated a climate action planning process to assess District greenhouse gas (GHG) emissions and develop strategies to reduce emissions. By creating and implementing the Climate Action Plan, the District hopes to contribute to regional efforts to address climate change. This 2016 greenhouse gas inventory establishes a **baseline inventory of District operations** to inform future action. In addition, this report includes an overview of **forecasted changes in GHG emissions** through 2045. The forecast can be used to set reduction targets.

Greenhouse Gas Emissions Overview

Methodology

The District is unique among agencies taking climate action; it is an independent special district created to acquire and preserve open space land. Local government greenhouse gas emissions protocols were designed with cities and counties in mind. As a result, there was no clear protocol to employ when conducting the District's inventory. Because the District somewhat functions like a local government (e.g., managing a vehicle fleet, using energy in buildings, commuting staff), we primarily used the ***Local Government Operations Protocol*** to set the boundaries of the inventory. To calculate emissions, we used guidelines from the *Local Government Operations Protocol* and the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC).* The approaches, methodologies, and findings in this report are consistent with these protocols.

GASES

For all emissions sources, we estimated the greenhouse gas impact form carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_20). We reported emissions in metric tons carbon dioxide equivalent ($MTCO_2e$), the standard unit for greenhouse gas inventories. For context, the average American individual produces about 20 $MTCO_2e$ per year.

BOUNDARIES

We used an **operational control approach,** as recommended by the *Local Government Operations Protocol*, to assess the District's emissions. We included emissions sectors that the District can influence directly through operating policies.

SECTORS

The emissions sectors included in this inventory are consistent with typical local government inventories and include:

- Facilities
- Vehicle fleet, maintenance equipment, and business travel
- Employee commutes
- Other facilities (in this case, tenant residences)

Typically, the activities performed by local governments do not include owning or managing agricultural land. However, managing agricultural rangeland is an integral part of the District's character and activities, so a **livestock sector** was added to the inventory to gain a more complete picture of the District's emissions sources.

SECTORS EXCLUDED FROM INVENTORY

Some sectors were excluded from the emissions inventory due to lack of data. In future inventory years, these emissions sectors can be tracked and included. Emissions sources not estimated include:

- Visitor, contractor, and volunteer transportation to open space preserves
- Contractor solid waste
- Industrial processes and product use (lifecycle analysis of products)

Inventory Findings

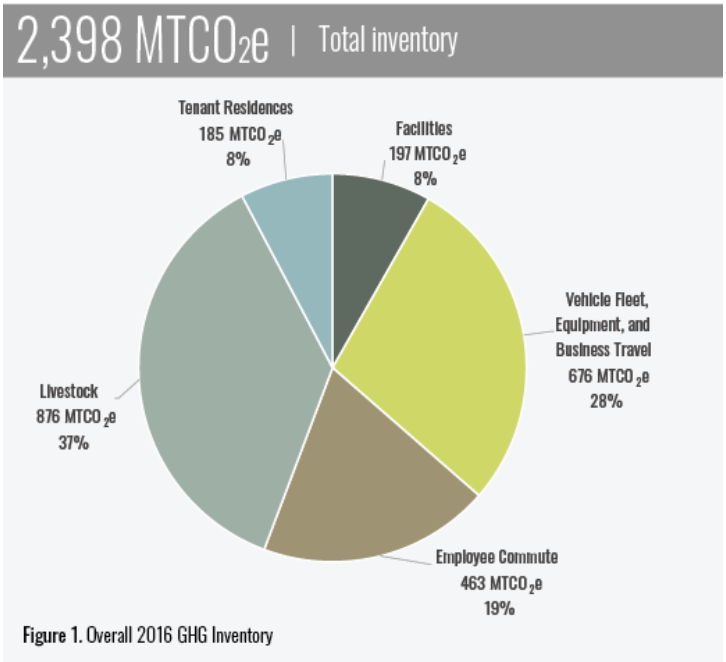


Figure 1. Overall 2016 GHG Inventory

In 2016, the Midpeninsula Regional Open Space District **produced approximately 2,398 MTCO$_2$e**—equivalent to the amount of carbon sequestered by 2,400 acres of the District's forest land in one year. Livestock contributed the most to total emissions, accounting for 37% of total emissions. The vehicle fleet was the second highest contributor (28%), closely followed by employee commute (19%). Tenant residences and facilities each made up approximately 8%.

Vehicle Fleet, Equipment, & Business Travel

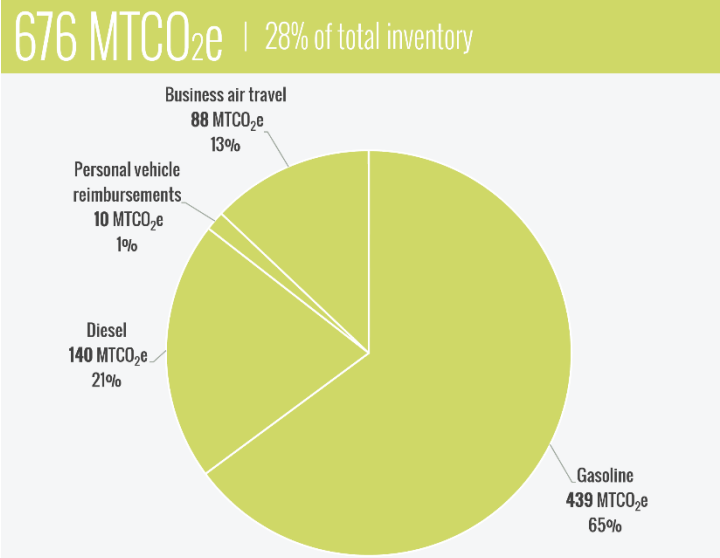


Figure 2. GHG Emissions from Vehicle Fleet, Equipment, and Business Travel in 2016

The District owns a fleet of 80 transport vehicles and five commercial trucks, as well as maintenance equipment such as chippers and chainsaws. The vehicle and equipment fleet require diesel and gasoline. The District uses vehicles to carry out maintenance activities, patrol open space preserves, provide emergency response, and transport District employees. The fuel efficiency of the vehicle fleet and frequency of use impact total emissions. Maintenance equipment is used to build and maintain trails, structures, and facilities.

Business air travel is also included in this sector. **Airplane travel alone accounts for 4%** of the total inventory.

Employee Commute

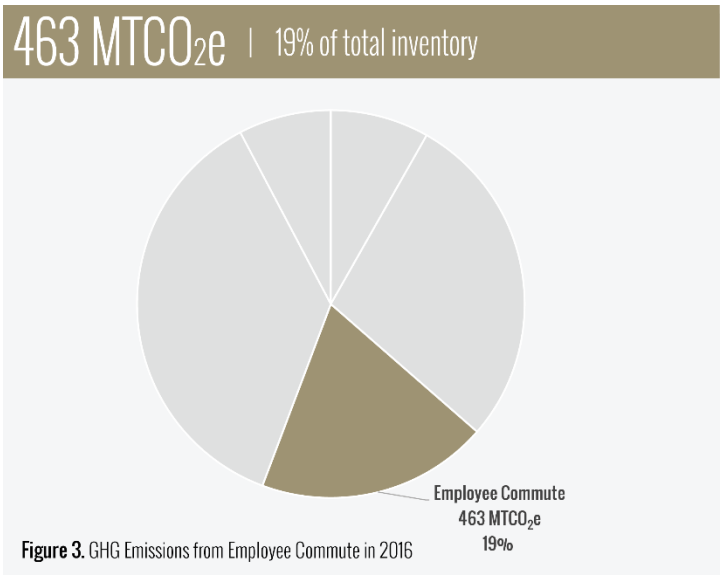


Figure 3. GHG Emissions from Employee Commute in 2016

To estimate employee commute emissions, District staff administered employee commute surveys of administrative and field staff. District employees all together commuted nearly 1.5 million miles in 2016. Over **80% of employees drive alone to work**, likely due to high housing costs and limited public transit options, particularly for field staff. While this activity is not directly under District control, the District can influence employee commute habits to reduce emissions by promoting flexible work schedules and alternative commute options.

Facilities

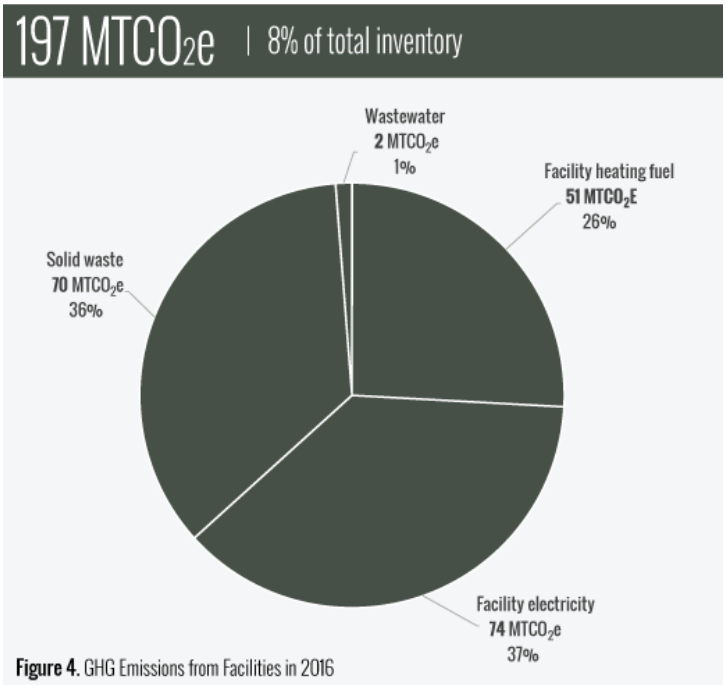


Figure 4. GHG Emissions from Facilities in 2016

The District occupies both **administrative and field offices**. The facilities emissions sector includes **energy use** from administrative offices at 330 Distel Circle and 4984 El Camino Real, as well as the Skyline Field Office, Foothills Field Office, South Area Outpost, and assorted small buildings, gates, and pumps. It also includes **solid waste** and **wastewater** generated by District activities. The top two contributors to this sector's emissions are electricity use and solid waste generation (Figure 4).

FACILITY ELECTRICITY AND HEATING FUEL USE

The generation of electricity requires energy and releases greenhouse gas emissions. A portion of electricity generation emissions are attributed to the District based on electricity use. PG&E's electricity mix in 2016 was 33% renewable. All metered electricity, including electricity used for buildings, gates, lights, and well pumps are included in this sector. Table 1 shows facilities ranked by electricity use. **The administrative offices consumed the most electricity, followed by the Skyline and Foothills Field Offices.**

Table 1. Electricity Use by Facility in 2016 (Total = 348,444 kWh)

Type of Facility	Address	Facility Name	Unit	2016 Use	%of Total Electricity Use
Office	330 Distel Cir	AO1	kWh	162,358	47%
Office	4984 El Camino Real Ste 108	AO2-4	kWh	64,531	19%
Office	21150 Skyline Blvd	SFO office	kWh	50,325	14%
Office	7400 Saint Joseph Ave	FFO office	kWh	43,623	13%
Office	18171 Pheasant Rd	SAO office	kWh	12,889	4%
Operations	21150 Skyline Blvd	Pump for SFO well	kWh	3,598	1%
Office	Cristo Rey Dr near	FFO county park	kWh	3,144	1%
Operations	21150 Skyline Blvd	SFO Nature Center	kWh	2,401	1%
Operations	Ws Stelling N Prospect	DOM pump	kWh	1,977	1%
Operations	5460 La Honda Rd	Event Center	kWh	1,428	0%
Office	7500 Saint Joseph Ave	FFO annex office	kWh	1,275	0%
Operations	6635 La Honda Rd	Small water pump	kWh	607	0%
Operations	13130 Skyline Blvd Gate	Gate	kWh	255	0%
Operations	16062 Skyline Blvd	Small light or gate	kWh	33	0%
TOTAL			**kWh**	**348,444**	

Electricity emissions will likely decrease in future inventories because the District is now part of Silicon Valley Clean Energy and Peninsula Clean Energy, which offer 50% or 100% renewable energy to their customers. The District uses **heating fuels** in its operations, consuming small quantities of natural gas and propane to heat the administrative office and field offices. **Heating fuels contribute 26%** to the sector's emissions.

SOLID WASTE AND WASTEWATER

The facilities sector includes emissions from all solid waste and wastewater generated by District operations. The **District's operations generated 41.6 tons of landfilled trash in 2016**. The field offices accounted for 87% of the solid waste produced. This is due to the maintenance activities conducted out of the field offices, such as building and repairing trail structures and fences. For example, those maintenance activities result in truckloads of treated wood that must be disposed of at a landfill where the wood decomposes and releases methane emissions.

Wastewater emissions are estimated to be small, only 1% of the sector's emissions.

Table 2. Waste Generation by Facility in 2016 (Total = 41.6 tons trash)

Facility	Unit	2016 Use	%of Total Waste Generated
Administrative offices	tons	5.6	13%
Field offices	tons	36.0	87%
TOTAL	tons	41.6	

Tenant Residences

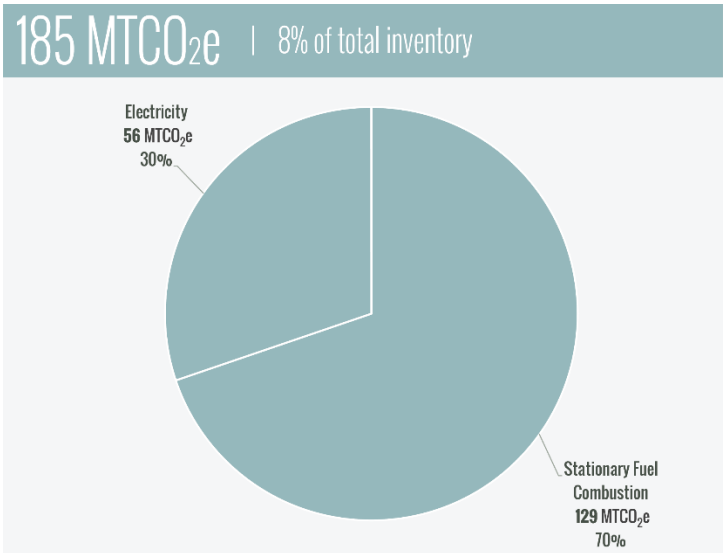


Figure 5. GHG Emissions from Tenant Residences in 2016

The District owns 40 homes that are leased to residents. Tenant heating with natural gas or wood and electricity use contribute a small portion to the total inventory, 8% in 2016. These emissions were estimated using the square footage of tenant buildings and regional energy consumption averages from the U.S. Energy Information Administration. Improved data collection in this sector, such as electricity bills and more detailed information on other heating sources, would help improve the accuracy of emissions estimates for tenant residences.

Livestock

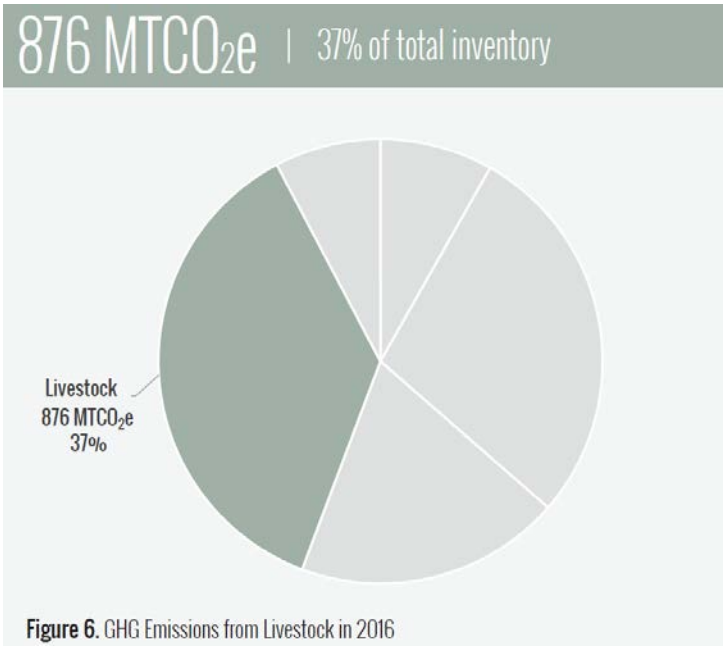


Figure 6. GHG Emissions from Livestock in 2016

The District uses conservation grazing to manage fuel (flammable vegetation) for fire protection, enhance the diversity of native plants and animals, help sustain the local agricultural economy, and foster the region's rural heritage. As part of the Coastside Protection Area Service Plan, the District has committed to conserving open space and agricultural land, preserving agricultural operations on the coast, and encouraging viable agricultural use of District owned lands. Currently, the District has about 400 cattle grazing on 10,800 acres. Grazing tenants also keep other livestock, such as horses, sheep, pigs, and chickens.

When ruminants like cattle digest grass, they produce and release methane. Methane is a strong greenhouse gas that has almost thirty times the impact of carbon dioxide on the atmosphere, so even a modest amount of methane emissions produces a significant greenhouse effect. Methane emissions associated with grazing animals are the largest source of emissions in the District.

This finding is consistent with Point Reyes National Seashore's greenhouse gas inventory, which also found cattle rangeland to be the largest emissions sector. Further research is required to understand the environmental costs and benefits of conservation grazing, such as carbon sequestration on rangeland and opportunities to reduce or offset livestock emissions.

Business as Usual Emissions Forecast

The business as usual (BAU) emissions forecast projects greenhouse gas emissions through 2045 to provide a sense of which emissions sectors will grow over time and which will decline. District planning, expected growth in staff, vehicle fleet growth, additional planned buildings, and new land acquisitions all inform the growth projections in the forecast. The BAU forecast does include California state fuel efficiency laws and changes to electricity emissions. The forecast presents a scenario where the District takes no additional action to reduce emissions.

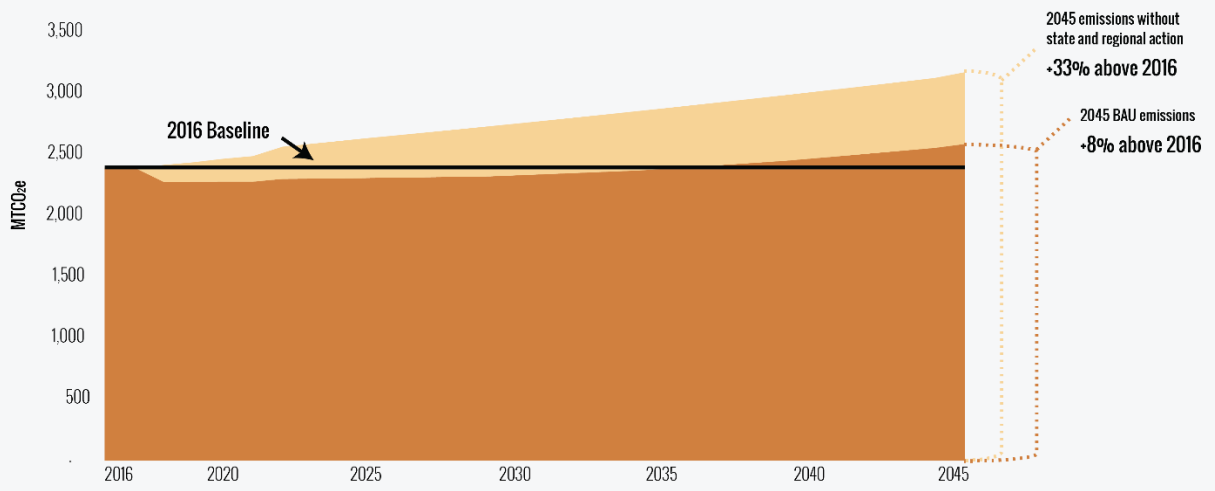


Figure 7. BAU Emissions Forecast by Sector 2016 through 2045

Planned District growth is offset by regional and state changes to **electricity carbon intensity** and **vehicle fuel efficiency**. The result is an **overall 8% increase in total greenhouse gas emissions by 2045**. Without existing state laws and renewable electricity from Silicon Valley Clean Energy and Peninsula Clean Energy, the District's emissions would grow 33% above the 2016 baseline by 2045. This business as usual growth scenario can inform reduction target setting and climate action strategies.

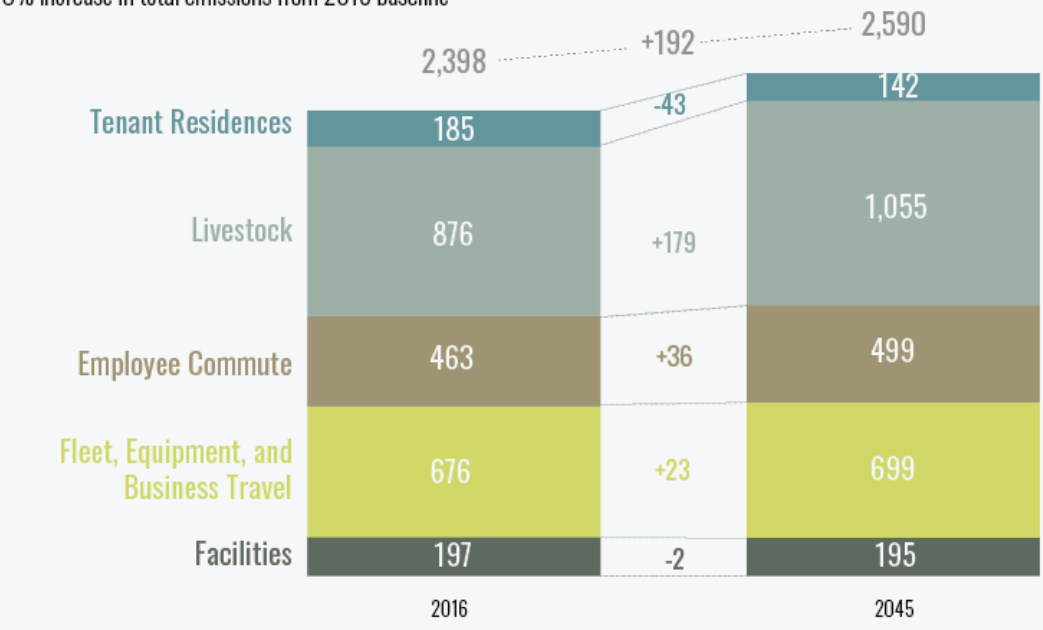


Figure 8. BAU Emissions Forecast by Sector for Overall Inventory 2016 and 2045 (units in $MTCO_2e$)

Implications of Inventory Findings

This greenhouse gas inventory and emissions forecast will be used to inform the development of the District's Climate Action Plan. Climate action strategies can be prioritized based on their potential impact on overall emissions. The forecast also provides insight into which emissions sectors will be reduced through state or regional action and which require the District to take independent action. This assessment, and its contribution to future planning efforts, supports the District's goal to be a leader in addressing climate change.

Midpeninsula Regional Open Space District

Memorandum

DATE: May 21, 2018

MEMO TO: Board of Directors

FROM: Hayley Edmonston, Climate Resiliency Fellow

SUBJECT: Potential Greenhouse Gas Reduction Strategies

This memo summarizes potential greenhouse gas reduction strategies that will be analyzed for the draft Climate Action Plan. The purpose of this memo is to provide the Board with a high-level picture of the District's greenhouse gas reduction options.

Vehicles, Maintenance Equipment, and Business Travel

- Improve vehicle fuel economy as vehicles are replaced
- Replace vehicles with electric or hybrid vehicles where possible
- Reduce miles driven by changing work practices and using teleconferencing
- Change diesel trucks and equipment over to plant-based renewable diesel
- Replace maintenance equipment with electric equipment where possible
- Reduce travel to conferences and trainings, particularly air travel

Facilities and Tenant Residences

- Require new District-owned or leased buildings to meet high energy efficiency standards
- Assess and retrofit existing offices for energy efficiency
- Assess and retrofit tenant residences for energy efficiency
- Purchase 100% renewable energy through Silicon Valley Clean Energy and Peninsula Clean Energy
- Study the viability of solar panel arrays on office roofs or parking lot carports
- Reduce the amount of solid waste generated by District activities
- Reduce the amount of wastewater generated by District activities

Employee Commuting

- Reduce commute days by expanding telecommute and compressed schedule options
- Incentivize commuting by public transit, bicycle, carpool, or electric vehicle by providing financial incentives and educating employees
- Reduce commute distance by providing more District housing

Livestock

- Research the viability of increasing soil carbon sequestration to offset emissions

- Research the effectiveness of the grazing program in reducing invasive species and fire risk

Visitor Transportation

- Assess emissions from visitor transportation and add to GHG Inventory
- Install electric vehicle chargers at preserves
- Study the viability of a park shuttle similar to San Mateo County Parks' pilot project
- Engage in regional planning to expand public transit and bicycle options to get to preserves