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Update on the San Leandro Greenhouse Gas Emissions Inventory 2015 and the San Leandro Climate Hazards Assessment

SUMMARY AND RECOMMENDATIONS

This report is for informational purposes only. No formal action is required.

BACKGROUND

Climate action planning in the Bay Area began in the late 2000s and resulted in a first round of carbon emission reduction plans that focused on energy efficiency and carbon reduction in the areas within the control of local governments, including: solid waste diversion, municipal operations, and building energy usage.

In 2006, StopWaste convened the Alameda County Climate Protection Project - a county-wide effort which included the cities of Alameda, Albany, Berkeley, Emeryville, Hayward, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City and the County of Alameda - to join the International Council for Local Environmental Initiatives (ICLEI) Local Governments for Sustainability 5-Milestone process to:

1. Conduct an inventory of city-wide greenhouse gas emissions
2. Set a carbon emissions reduction target
3. Establish a Climate Action Plan
4. Implement a Climate Action Plan
5. Monitor and evaluate progress

In 2007, ICLEI conducted the 2005 inventory on behalf of the city (milestone #1) and subsequently

the City Council set a target to reduce community-wide emissions by 25% below 2005 levels by year 2020 (milestone #2). San Leandro completed the third milestone by adopting the San Leandro Climate Action Plan at the end of 2009 with the theme, “Reduce, then Produce” to first maximize energy efficiency and then look to generate electricity with renewable energy.

Since adoption of the 2009 Climate Action Plan, City staff has implemented the actions in the plan (milestone #4) by utilizing funds from federal stimulus programs, notably the Energy Efficiency and Conservation Block Grant (EECBG), to incorporate energy efficiency in government operations and promote green building and energy efficiency in community programs. Transit-Oriented Development has been promoted through the adoption of the San Leandro General Plan 2035 and approvals of transit-oriented development entitlements and zoning changes, as well as completion of various transportation improvement projects and bicycle/pedestrian planning.

Milestone #5, to monitor and evaluate emissions reductions, has been carried out on a five-year cycle since 2005. San Leandro’s 2010 greenhouse gas emissions were inventoried in 2014 with assistance from StopWaste and PG&E. In 2016, through a grant from the East Bay Energy Watch and the Local Government Commission, the City obtained the services of an AmeriCorps/CivicSpark fellow, Ben Davenport, who completed the City’s first in-house greenhouse gas emissions inventory for municipal and community-wide emissions for the year 2015. The results of this inventory are presented in detail in the attached 2015 Community and Municipal Emissions Inventory report.

Staff used the ICLEI methodology, which complies with the Global Protocol for Community-Scale Emissions (GPC) standards. This enabled the City to fulfill its obligations to the Global Covenant of Mayors via reporting these emissions to the Carbon Disclosure Project (CDP) in May 2017. A more detailed methodology for accounting and emissions factors is available in the Appendix.

Also included in this update is an in-depth assessment of climate hazards that are expected due to changing climate conditions already underway. In 2016, the services of a consultant, FourTwentySeven Climate Solutions, were sponsored by StopWaste to create Climate Hazard Assessments for the cities of Albany, Emeryville, Fremont, Hayward, Livermore, Piedmont and San Leandro to promote a consistent approach to incorporating adaptation and resilience into climate planning in Alameda County.

The resulting San Leandro Climate Hazard Assessment report will inform the City of San Leandro’s future adaptation strategies and has already helped in the completion of its Local Hazard Mitigation Plan and reporting to the Global Covenant of Mayors. The Assessment will also assist San Leandro in obtaining funding for resiliency efforts and for federal funding from agencies such as the Federal Emergency Management Agency (FEMA.) The detailed report is attached and a summary analysis is presented in this staff report.

This summary report omits data tables and graphics. Please refer to the attached reports, San Leandro Community and Municipal Emissions Inventory for 2015 and the San Leandro Climate Hazard Assessment, for the full set of data tables, graphics, and citations for data presented in the narrative below.

Analysis

The City of San Leandro is committed to the measurement and reduction of greenhouse gas

emissions within its management and control. The City has conducted inventories every five years since 2005 to continuously evaluate the scale and scope of emissions. Greenhouse gas inventories provide policymakers with information necessary to assess the existing state of carbon emissions within their jurisdictions and to make decisions on where to focus mitigation efforts. The community inventory represents all the energy used and waste produced within the City of San Leandro and its contribution to greenhouse gas emissions. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

Greenhouse gases are defined as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆). Carbon dioxide equivalent (CO₂e) is a unit of measure that normalizes the varying climate warming potential of the six greenhouse gas emissions. For example, one metric ton of methane is equivalent to 21 metric tons of CO₂e. One metric ton of nitrous oxide is equivalent to 210 metric tons of CO₂e. The global warming potential of these gases was determined in the International Panel on Climate Change (IPCC) 4th Assessment.

San Leandro Community Greenhouse Gas Emissions Inventory 2005 to 2015

Community Emissions, in metric tons (MTCO₂e):

2005: 675,288

2010: 612,376

2015: 636,172

In 2015, San Leandro's community emissions were 636,172 metric tons (MT) CO₂e, a reduction from the 2005 baseline of 675,288 MT CO₂e by 39,116 MT CO₂e. Municipal operations and facilities contributed 6,225 MT CO₂e, about 1% of the total inventory. The largest sectors contributing to community emissions are transportation (60%), commercial and industrial energy use (23%), and residential energy use (13%). Solid waste and wastewater emissions contributed only about 4% of total emissions.

This mixed result can be attributed to a reduction in energy usage during the 2008-2010 Great Recession - a period of decreased economic activity with greater vacancies in San Leandro's building stock, a slowdown in building and goods shipments - and an uptick in development and population growth between 2010 and 2015. The surge in transportation, especially in the through-traffic of commercial trucks and passenger vehicles, are outside the direct control of the City of San Leandro.

The largest source of carbon emissions in San Leandro is transportation, accounting for 60% of all community emissions. Vehicle miles travelled (VMT) have increased over the past few years and overall transportation emissions, after declining slightly in 2010, went up significantly between 2010 and 2015. Analysis of the VMT data shows that much of this increase is due to heavy-truck traffic through San Leandro. As the economy has improved, goods movement up and down the I-880 corridor has increased transportation-related emissions occurring within city limits.

Commercial and Industrial emissions from building and process energy use, which accounts for 23% of citywide emissions, showed steep declines to approximately 29% less than 2005 levels. Residential building emissions also dropped 16% from 2005 levels. Variation in weather patterns can influence building energy usage, but efforts by residents, commercial/industrial building owners and

businesses, and utilities (as part of the state-mandates and incentive programs under AB 32) have also played a role in improving the energy performance of San Leandro's building stock.

The types of power sources that make up a utility's electricity generation mix also have had a significant impact on a city's greenhouse gas emissions in the commercial, industrial and residential sectors. Over the past several years, PG&E's electric grid has reduced its reliance on carbon-intensive energy sources. PG&E's power mix in 2015 comprised of approximately 25% natural gas, 23% nuclear, 6% large hydro-electric and 30% renewable energy, with 17% remaining from "unspecified" sources. In 2015, PG&E's electricity created only one-third as many greenhouse gas emissions per kilowatt-hour compared to the industry average and produced over two times the amount of renewable energy than in 2005.

Waste diversion policies - mandatory recycling and composting through county-wide regulations - contributed to steep decreases in emissions from the Solid Waste sector. The 50% reduction in tons landfilled in 2015 compared to 2005 resulted in a decrease of 60% in emissions from solid waste. Wastewater treatment emissions remained flat between 2005 and 2015 even while San Leandro's Water Pollution Control Plan (WPCP) decreased its process emissions by 41%. The inclusion of emissions data from the Oro Loma Sanitary district in the 2015 emissions calculation offset the significant upgrades made at the WPCP.

San Leandro Municipal Emissions from 2005 to 2015

Municipal Emissions, in metric tons (MTCO_{2e}):

2005: 5,146

2010: 7,413

2015: 6,225

Over the past ten years, San Leandro's municipal emissions have increased by 21% to approximately 6,225 MT of CO_{2e} from the 2005 baseline of 5,150 MT CO_{2e}. This increase may not reflect actual increase in emissions; improved methods of measurement and calculation as well as new sources counted in 2015 that were not included in the 2005 inventory. 2015 emissions are 16% lower than in 2010 and, while the target for 25% reductions by 2020 has not been met, ongoing energy efficiency and renewable energy projects for city facilities will enable municipal operations to make greater progress towards the 2020 goals.

City Buildings and Facilities emissions have decreased significantly since 2005, showing a decrease of 10%. This sector represents approximately 20% of municipal emissions. This decrease is due to the installation of more energy-efficient building equipment in 2010-2012, as well as the cleaner power mix coming from PG&E. Wastewater treatment emissions, which represent 27% of municipal emissions, have decreased by approximately 16% since first accurately measured in 2010.

Substantive increases in city emissions have [are](#) only been noted in one sector: the city's vehicle fleet (representing 24% of emissions) increased by 20% since 2005. Staff is taking a closer look at the data associated with these percentages, as the number of fleet vehicles/mobile equipment has stayed flat between 2005-2015, and the State-mandated diesel retrofits have been installed prior to 2010.

Conversely, Streetlights and Traffic Signals show reductions of 18% since 2005, due to the partial

conversion of some streetlights (14%) and all traffic signals to LEDs in 2012. The remaining 86% of streetlights are being retrofitted to smart controllers and LED light fixtures in 2017 through a guaranteed energy savings contract with Climatec, as are City buildings/parks interior/exterior lighting, which will result in greater reductions in emissions in the next inventory.

Climate Hazard Assessment

The climate hazard analysis covers the following likely scenarios that climate change may have on our community. San Leandro's climate is projected to grow hotter and experience fluctuations in precipitation. The analysis also finds that rising sea levels may inundate important city and community assets. The exposure to the hazards examined in the attached Climate Hazard Assessment include:

High exposure:

- *Inland Flooding*: Significant exposure during 100-year storm (1% annual chance) with increasing exposure and risk during 500-year storms (0.2% annual chance).
- *Wildfire*: Some assets are located in high fire hazard severity zones or are in close proximity to very high fire hazard severity zones.

Medium exposure:

- *Sea Level Rise*: Significant exposure likely by mid-century with a 5-year (20% chance) storm surge, a combination of permanent and temporary inundation equivalent to 36 inches of sea level rise.
- *Temperature Change*: Increase in the number of extreme heat days
- *Rainfall-induced Landslides*: important assets in a few landslide hazard zones.

Low exposure:

- *Precipitation*: Limited change in overall rainfall totals.

In summary, the Climate Hazards Assessment found that San Leandro will likely be affected by the combination of sea level rise, high tides and flooding along the shoreline and through the southwest portion of the city, which threaten to limit mobility and damage amenities and industry that are important to San Leandro and the regional economy. However, the most severe impacts will be seen in the long term, when projected temperature increases and the frequency of very hot days will impact a broader set of the city's assets and population, resulting in greater occurrence of heat-related illness and increased energy usage for cooling.

Conclusions and Next Steps

Through its commitment to the Global Covenant of Mayors, the City has pledged to conduct continued tracking of greenhouse gas emissions. Municipal emissions inventories will be updated on a regular basis, while updates to citywide inventories (which rely on outside information more difficult to obtain) will continue to be conducted every three to five years. The City's transition to the ICLEI ClearPath platform will allow for more consistent tracking of greenhouse gas trends in future years. To translate the information contained in these inventories into action, the City and its partners

continue to develop and execute policies intended to help mitigate greenhouse gas emissions.

Overall, the 2015 Greenhouse Gas Emissions Inventory and the Climate Hazards Assessment reveal a need to place emphasis on the City's efforts to reduce carbon emissions, especially in the transportation sector, and to plan for climate hazards already creating impacts in the medium term.

Transportation emissions within municipal operations can be addressed over the next few years by switching to renewable diesel for trucks and heavy equipment and electric vehicles (EVs) for certain city vehicles as fleet vehicles are replaced. To attain emissions reductions in the private use of vehicles and commercial trucks, the City can continue to promote the use of EVs but primarily must rely upon state- or utility-sponsored programs for fuel efficiency and fuel switching (converting from gasoline or regular diesel to electric, hydrogen, or renewable diesel fuels).

Certain energy efficiency projects (municipal LED streetlighting and efficient HVAC projects and community-wide residential energy upgrade incentive and DIY programs) outlined in the 2009 CAP were pursued with federal Energy Efficiency Community Block Grant (EECBG) funding in 2010-2012. However, after the Great Recession, overall coordination of climate action activities ceased and those federal programs were terminated when the EECBG funding ended in 2012. Mandatory measures that were proposed in the 2009 CAP to require residential or commercial energy conservation in local ordinances were not implemented. Again, state-wide regulations such as the CalGreen building code will be important elements in achieving energy efficiency in existing and new building projects.

In 2017, the City will complete a guaranteed energy savings project for streetlights, irrigation controls and building equipment as well as begin the design and installation of approximately 1 megawatt (MW) of solar photovoltaic at the Water Pollution Control Plant, a result of the award by the California Energy Commission of a \$1.996M grant.

In the building and facilities sector, greener building codes will ensure that new construction is more energy efficient. The statewide energy benchmarking and disclosure program for large commercial buildings, mandated to begin in 2017 under AB 802, will help building owners, operators, and tenants better understand the opportunity to save energy and reduce carbon emissions in existing facilities. Finally, the overall electricity mix will become more weighted with renewables under the Community Choice Aggregation project, East Bay Community Energy. When combined with possible microgrid development, new renewable energy projects in San Leandro's private and public sector will contribute to decreased emissions in building energy use.

These policies can have a significant impact on San Leandro's carbon footprint, but deeper reductions will be necessary to reach aggressive targets beyond 2020. San Leandro is currently working with StopWaste to develop a framework for reducing greenhouse gas emissions 50% from current baseline by 2030 and 80% by 2050, targets set by the California Air Resources Board (CARB). To reach these ambitious new goals for 2030 and 2050, deep cuts in carbon emissions are required. Cities must expand their focus to access hard-to-reach measures such as fuel switching, investment in renewable energy and materials re-use in an ambitious de-carbonization approach. The State of California and several cities nationally and worldwide have made such commitments. San Leandro hopes to partner with other small cities in Alameda County to create a CAP 2.0 that will enable smaller communities to achieve these deep carbon reduction targets.

Now that San Leandro has completed its 2015 emissions inventory, and the results reported to the CDP/Global Covenant of Mayors, staff will focus on engaging in public outreach efforts to create stakeholder momentum behind climate action. The work will also include policy research on best practices, coordination of community meetings to evaluate concerns and potential support for these actions, and assistance in preparing updates to City Council on progress.

With the results of the Hazard Assessment report, coordination with other city departments and functions such as Engineering & Transportation, Community Development, and Emergency Management will be conducted to plan for actions and investments needed to confront climate hazards in the medium- to long-term. Over the next year, the City will seek funding for a comprehensive Climate Action and Adaptation Plan to create strategies for deeper emissions reductions and preparedness for the climate changes already underway. Public engagement will be a cornerstone in these future efforts.

Current Agency Policies

- San Leandro Climate Action Plan (2009)
- San Leandro General Plan 2035 (2016)

ATTACHMENT(S)

- San Leandro Community and Municipal Greenhouse Gas Emissions for 2015
- San Leandro Climate Hazards Assessment

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