



**BOARD OF DIRECTORS  
EAST BAY MUNICIPAL UTILITY DISTRICT**

375 – 11<sup>th</sup> Street, Oakland, CA 94607

Office of the Secretary: (510) 287-0440

**AGENDA  
Sustainability/Energy Committee  
Tuesday, January 28, 2020  
8:00 a.m.  
Training Resource Center**

**(Committee Members: Directors Linney {Chair}, Katz and Mellon)**

**ROLL CALL:**

**PUBLIC COMMENT:** The Board of Directors is limited by State law to providing a brief response, asking questions for clarification, or referring a matter to staff when responding to items that are not listed on the agenda.

**DETERMINATION AND DISCUSSION:**

1. Climate Change Monitoring and Response Plan (Chan/White)
2. Greenhouse Gas Inventory Methodology Update (Chan)
3. Energy Policy Update (Chan)
4. Managing Vehicle Emissions (Chan)

**ADJOURNMENT:**

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## EAST BAY MUNICIPAL UTILITY DISTRICT

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DATE: January 23, 2020

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Clifford C. Chan, Director of Operations and Maintenance *CCC*  
Eileen M. White, Director of Wastewater *EMW*

SUBJECT: Climate Change Monitoring and Response Plan

### INTRODUCTION

The District has been a leader in addressing climate change with its successful efforts to produce renewable energy, reduce greenhouse gas (GHG) emissions, diversify its water supply, and build resilience into its infrastructure. Since 2008, the District's Strategic Plan has included a strategy to address climate change. The District has proactively considered the impacts of climate change and has taken actions to understand, mitigate, and adapt to those impacts. This information is summarized in the District's Climate Change Monitoring and Response Plan (CCMRP). In 2019, an updated CCMRP was prepared to expand on the District's climate change efforts at the wastewater facilities. This item will be presented at the January 28, 2020 Sustainability/Energy Committee meeting.

### DISCUSSION

Climate change poses significant threats to the planet, the state, and the District. Climate change will result in rising sea levels, reduced snowpack, increased climate variability, and impacts to the ecosystem. For over a decade and a half, the District has been engaged in a range of climate change-related activities including establishing and meeting aggressive GHG reduction goals, considering the impacts of climate change on its water supply, generating renewable energy, diverting GHG-generating waste from landfills, making infrastructure improvements, participating in the U.S. Environmental Protection Agency's Climate Ready Water Utilities working group, participating in research, and obtaining green building certification for many of its facilities.

In 2008, the District prepared its first CCMRP to understand, mitigate, and adapt to the impacts of climate change on the water system. This plan has been updated three times since 2008. In 2019, a separate CCMRP was prepared to evaluate the vulnerabilities of the wastewater system facilities, identify wastewater facilities' contribution to GHG emissions and efforts to reduce those emissions, identify adaptation strategies, and describe collaborative efforts with regional partners to reduce the impacts of climate change from the wastewater system. This memo summarizes some of the findings from the wastewater CCMRP.

The District has reduced wastewater related GHG emissions by producing renewable energy, finding opportunities to reduce electricity demand, and accepting high-strength waste as part of the District's Resource Recovery (R2) Program. Further reductions in wastewater process GHG emissions will become more and more challenging due to the nature of emissions from wastewater sources.

The District's wastewater GHG emissions primarily come from three sources: process emissions due to nitrogen, purchased electricity, and combustion of fossil fuels. The District has used the General Reporting Protocol, developed by The Climate Registry (TCR), to estimate emissions from wastewater facility operations. The science of GHG emissions from wastewater is evolving, and the new Water Energy Nexus (WEN) protocol developed by TCR, in 2019, specifically for water and wastewater utilities now accounts for GHG emissions attributed to wastewater treatment and discharge. Specifically, nitrogen in wastewater converts partly to nitrous oxide (N<sub>2</sub>O) – a GHG 300 times more powerful than carbon dioxide.

Prior to the 2019 WEN protocol, wastewater process GHG emissions were not included in a utility's inventory but rather included in the inventory for the community where the utility resides. There is still uncertainty about these wastewater-specific GHG emissions, and the science that forms the basis for the calculations continues to evolve. Wastewater process GHG emissions are challenging to eliminate. Natural biological processes convert nitrogen to N<sub>2</sub>O in both the treatment process and the environment after discharge. The District is exploring technologies to remove nitrogen from wastewater as part of its Integrated Wastewater Master Plan. Those technologies, however, will only modestly reduce overall GHG emissions from nitrogen, since the emissions primarily occur in the treatment process rather than after discharge.

As part of the 2019 CCMRP, the District also investigated how wastewater facilities will be impacted by climate change, established adaptation strategies, and described collaborative efforts with regional partners to reduce the impacts. The CCMRP concluded that while wastewater infrastructure should avoid major impacts over the next few decades, there are potential risks including:

- Sea level rise: In the 30-year planning forecast, the MWWTP may experience inundation due to rising sea level when combined with a storm surge during extreme (100-year) storm events. Working collaboratively with the District's regional partners and implementing planned improvements to the shoreline will reduce or eliminate these risks.
- Groundwater level rise: Inflow and infiltration (I/I) will incrementally increase if current sewer pipe conditions remain the same. Implementing planned District and tributary agency projects under the East Bay Regional Wet Weather Consent Decree (Consent Decree) will address these effects and reduce or eliminate their impacts.
- Local climate and weather pattern changes: More intense storms will result in changes to I/I, increasing both peak wet weather flows and the duration of those peak flows. Improvements under the Consent Decree will reduce the impact of these changes.

The District continues to follow the climate change science. The CCMRP uses the information from the Intergovernmental Panel on Climate Change's (IPCC's) Fifth Assessment Report. The IPCC recently released three special reports: Global Warming of 1.5°C; Climate Change and Land; and Ocean and Cryosphere in a Changing Climate. The CCMRP will be updated when the Sixth Assessment Report is released in 2021.

The District continues to participate in other climate-related activities including the Bay Area Climate Action Network, TCR, and "We Are Still In." In addition, on June 11, 2019, the District adopted a Climate Action Policy to affirm its commitment to addressing climate change and continuing its leadership role in the industry.

## **NEXT STEPS**

The District will continue its efforts to mitigate and adapt to the impacts of climate change on the water and wastewater systems. Actions planned for Fiscal Years 2020 and 2021 include:

- Combine the water and wastewater CCMRPs into a single document.
- Finalize the District's Climate Change Design Guidelines.
- Update the District's Energy Policy.
- Adopt the WEN protocol for GHG emissions reporting beginning calendar year 2019.
- Implement climate change adaptation modifications on the Pump Station M Rehabilitation Project and Dechlorination Facility Project.
- Collaborate with neighboring jurisdictions, regulators, and stakeholders to address climate change adaptation plans, including sea level rise along the San Francisco Bay shoreline.

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## EAST BAY MUNICIPAL UTILITY DISTRICT

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DATE: January 23, 2020

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Clifford C. Chan, Director of Operations and Maintenance *CCC*

SUBJECT: Greenhouse Gas Inventory Methodology Update

### INTRODUCTION

In 2019, a new voluntary protocol for conducting greenhouse gas (GHG) inventories called the Water-Energy Nexus (WEN) was released by The Climate Registry (TCR). The District was part of the advisory committee during the WEN development and became a founder of the WEN. The WEN protocol provides guidance to water and wastewater utilities in calculating their GHG emissions. The District will incorporate the updated WEN methodologies into its annual GHG inventory beginning with the calendar year 2019 reporting year. This item will be presented at the January 28, 2020 Sustainability/Energy Committee meeting.

### DISCUSSION

The District has been tracking and reporting its GHG emissions on a voluntary basis since 2005 using the TCR's General Reporting Protocol. The WEN is a new protocol developed by TCR and funded by the State of California to better calculate GHG emissions attributed to water and wastewater operations. TCR also updated its General Reporting Protocol in May 2019. The District calculated its 2018 GHG emissions using the updated protocol and compared the results against the prior protocol for the same year. The table below summarizes the results.

Emission Type	2018 Emissions Prior Protocol (metric tons)	2018 Emissions WEN Protocol (metric tons)
Anthropogenic	18,817	30,823
Biogenic	36,377	41,598

Several new sources of emissions have been added to the WEN, resulting in a roughly 50 percent increase in reported anthropogenic, or human-caused, emissions compared to the past methodology. Emissions from biogenic, or natural processes, increased 14 percent under the new protocol. The increase in emissions using the updated protocol is described in detail in the table below. Emissions of nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), and refrigerants are converted to carbon dioxide equivalent (CO<sub>2</sub>e).

Emission Activity	Increased Emissions (metric tons, CO <sub>2</sub> e)	Description
Wastewater Treatment	876	Process emissions related to treatment of wastewater
Wastewater Discharge	9,861	Process emissions related to discharge of wastewater containing nitrogen
Refrigerants	213	Fugitive emissions related to refrigerant-containing equipment
N <sub>2</sub> O and CH <sub>4</sub>	340	Direct emissions from combustion of fuels
Minor Changes	716	Combination of protocol changes and adjustments to prior data
Flared Biogas	5,221 (biogenic)	Direct emissions from biogas combustion in the flares (previously exempted)

The most significant increase in anthropogenic emissions is attributed to wastewater discharge process emissions. The WEN protocol contains an emission factor based on the amount of nitrogen in wastewater discharged to surface waters not previously accounted for in the prior protocol. The addition of this emission factor to the WEN protocol has not been universally accepted by wastewater utilities since it does not account for specific plant and receiving water conditions.

Prior to the 2019 WEN protocol, wastewater GHG emissions were not attributed to a specific utility but viewed as contributed by the community. Due to the ongoing debate about the appropriateness of attributing the responsibility for all the GHGs to the utility, in the interim the District intends to follow the WEN protocol and report these emissions but exclude the GHG emission reduction goal until the science and emissions estimation is better developed.

## NEXT STEPS

The District will adopt the new WEN protocol to estimate its annual GHG inventory beginning with the calendar year 2019 reporting year and establish a new baseline for GHG tracking. In addition, the District will seek third-party verification of its inventory. The new protocol and inventory will help inform the District's future GHG reduction goals and strategies.

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## EAST BAY MUNICIPAL UTILITY DISTRICT

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DATE: January 23, 2020

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Clifford C. Chan, Director of Operations and Maintenance *CCC*

SUBJECT: Energy Policy Update

### INTRODUCTION

At the October 22, 2019 Sustainability/Energy Committee meeting, staff presented proposed revisions to Policy 7.07 – Energy, including a proposal to accelerate the District’s greenhouse gas (GHG) emission reduction goals for both indirect and direct emissions to zero by 2040. The Committee provided feedback to staff on the proposed changes. This memo addresses the Committee’s comments and updates the cost analysis for several alternatives. This item will be presented at the January 28, 2020 Sustainability/Energy Committee meeting.

### SUMMARY

In 2003, the District adopted Policy 7.07 – Renewable Energy to guide cost-effective investments in renewable energy and encourage efficient energy use. In 2008, the District added an objective to its Strategic Plan to ensure the District mitigates its GHG emissions in response to climate change. In 2013, the District recast Policy 7.07 to address all of the District’s energy uses and established aggressive GHG reduction goals, carbon-free for indirect (electricity) emissions and a 50 percent reduction in direct (fuel) emissions by 2040 compared to a 2000 baseline. At the October 22, 2019, Sustainability/Energy Committee meeting, the Committee expressed interest in a more aggressive GHG reduction, targeting an emissions-free goal by 2030 using verifiable high-quality carbon offsets.

The District uses a number of strategies to meet its GHG reduction goals including investing in renewable energy projects, purchasing power from Community Choice Aggregators, improving building energy efficiency, installing more energy efficient pumps and equipment, water conservation, investing in more fuel efficient vehicles, and using renewable diesel. In addition, the District will benefit from Senate Bill (SB) 100, which requires renewable energy and zero-carbon resources to supply 100 percent of electric retail sales in California by 2045.

The District purchases nearly 20 percent of its electricity use from the Western Area Power Administration (WAPA), which is not subject to SB 100, but offers the District significant cost savings of approximately \$2 million each year. The Climate Registry (TCR) protocol provides

guidelines for indirect emissions sources, such as WAPA, which does not publish a certified emissions factor. For those sources, a regional grid emissions factor published by the Emissions and Generation Resource Integrated Database (eGRID) may be used as a surrogate. Recent eGRID factors in California are trending downward by about 3.5 percent per year, consistent with the state's efforts to reduce the emissions from electricity generation.

However, the District will still need to purchase offsets or certificates to meet its GHG emission reduction goals. Under TCR protocols, use of carbon offsets is voluntary for meeting GHG emission goals, but when used, must be real, additional, permanent, transparent, verified and owned unambiguously. In order to meet these standards, the District will need to purchase California Carbon Offsets (CCO), California Carbon Allowance (CCA), or equivalent; these offsets currently sell in the range of \$15 - \$20 per metric ton (MT). This price is approximately ten times higher than the prices used in prior District cost estimates because of the TCR requirements for offsets. Furthermore, the United Nations (UN) and International Monetary Fund (IMF) estimate that Carbon Offset (CO) pricing will need to be closer to \$70 - \$80 per MT this decade to limit warming below 2 degrees Celsius. As a result, the District can expect CO pricing to increase significantly over time.

## FISCAL IMPACT

The table below summarizes the estimated cost to meet the District's current GHG reduction goal and the cost if the goal is changed to eliminate GHG emissions by 2040 and 2030 based on current low range and future market price for CO. These costs are cumulative through 2045. The table also includes an estimate if wastewater process-related emissions are included based on the TCR's new Water-Energy Nexus protocol.

	Include Wastewater Process Emissions		Exclude Wastewater Process Emissions	
Energy Policy goals	CO of \$15/MT	CO of \$80/MT	CO of \$15/MT	CO of \$80/MT
Current Goal - 100% indirect, 50% direct by 2040	\$3,900,000	\$20,800,000	\$1,200,000	\$6,400,000
Proposal A – 100% indirect and direct by 2040	\$4,800,000	\$25,600,000	\$1,800,000	\$9,200,000
Proposal B – 100% indirect and direct by 2030	\$7,300,000	\$38,800,000	\$3,600,000	\$19,200,000
Annual cost to purchase CO beyond 2045	\$320,000	\$1,720,000	\$160,000	\$880,000

The District's current strategy in Policy 7.07 – Energy is to select the least cost option to meet its GHG reduction goals for fuel and electricity use. Based on the District's projected GHG emissions, the cumulative cost through 2045 to meet the current goal is between \$1.2 million - \$6.4 million, the cost to meet the 2040 goal is between \$1.8 million - \$9.2 million and the cost to meet the 2030 goal is between \$3.6 million - \$19.2 million with the annual cost between \$160,000 - \$880,000 for all three goals beyond 2045.

Staff is recommending the District inventory and track wastewater process-related emissions but exclude those emissions from the GHG emission reduction goal until after the Integrated Wastewater Master Plan is finalized, and the science and emissions estimation in the Water-Energy Nexus protocol is better understood.

## **NEXT STEPS**

Comments from the Sustainability/Energy Committee will be evaluated and brought back to the Sustainability/Energy and Finance/Administration Committees, and considered concurrent with the Fiscal Year 2022/2023 budget cycle to evaluate the cost implications.

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## EAST BAY MUNICIPAL UTILITY DISTRICT

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DATE: January 23, 2020

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager *ARC*

FROM: Clifford C. Chan, Director of Operations and Maintenance *CCC*

SUBJECT: Managing Vehicle Emissions

### INTRODUCTION

In July 2019, a consortium of four automakers agreed to California's voluntary framework to reduce greenhouse gas (GHG) emissions and criteria pollutants for light duty vehicles. California also implemented policies requiring state agencies to only purchase vehicles from manufacturers that have committed to these emission reduction goals. At the November 12, 2019 Board meeting, the Board asked staff to consider a policy to limit future purchases to automakers that support the voluntary framework. This topic will be presented at the January 28, 2020 Sustainability/Energy Committee meeting.

### RECOMMENDATIONS

1. Follow California's fleet procurement restrictions.
2. Continue purchasing the Toyota Prius consistent with the state's procurement restrictions.

### DISCUSSION

On July 25, 2019, the California Air Resources Board (CARB) announced an agreement with several automakers on a voluntary framework to reduce emissions. The agreement was in response to the federal government's Safer Affordable Fuel-Efficient (SAFE) Vehicle Rule. The SAFE Rule would freeze the Corporate Average Fuel Economy (CAFE) and Carbon Dioxide (CO<sub>2</sub>) standards for model years 2020-2026 passenger cars and light trucks. Ford, Honda, BMW, and Volkswagen agreed to the voluntary framework. On September 20, 2019, 21 states, commonwealths, districts, and cities joined a lawsuit in federal court in support of California's ability to set its own GHG emissions and zero-emissions vehicle standards.

#### Fuel Efficiency Impacts on GHGs Emissions

CARB identified the transportation sector as the largest source of GHG emissions in the state. The most cost-effective strategy to reduce GHG emissions from transportation is through increasing vehicle fuel economy. The previous administration's federal CAFE standards increase fuel efficiency 4.7 percent per year for model years 2020-2025 vehicles. It has been estimated

that freezing progressive increases required by the CAFE standards at the 2020 levels would result in an additional 120 million metric tons of CO<sub>2</sub> equivalent emissions by 2030. CARB's voluntary agreement would increase fuel efficiency by 3.7 percent per year from 2020-2026. The agreement would eventually achieve a standard of approximately 50 miles per gallon (mpg) by 2026 as compared to the current federal proposal of 39 mpg.

### State Vehicle Procurement Restrictions

California owns and operates a fleet of vehicles that range from electric compact vehicles to heavy-duty trucks. The state Department of General Services (DGS) solicits bids annually with multiple suppliers to purchase many types of vehicles for their fleet. As allowed under Public Contract Code, Section 10298, the District purchases most vehicles using competitively awarded state contracts without pursuing separate competitive bidding.

On September 20, 2019, Governor Newsom issued an Executive Order directing DGS to "promote zero-emission vehicle purchasing in state and local government fleets." As a result, state agencies are required to purchase vehicles from Original Equipment Manufacturers (OEMs) that recognize California's authority to set vehicle emissions standards and have aligned with CARB's commitment to reduce their fleet's emissions (CARB-aligned OEM). State agencies are prohibited from purchasing sedans powered solely by an internal combustion engine utilizing fossil fuels, as well as sedans powered by flex-fuel or bi-fuel engines utilizing petroleum-based fuels and other fuels such as ethanol. However, there are exemptions for some situations including sedans, such as the Toyota Prius, powered by a hybrid electric engine.

The District currently purchases the Toyota Prius through the state contract. Toyota has not agreed to CARB's voluntary framework. Staff estimates costs would increase about \$124,000 in the next five years if the District were to purchase the hybrid-electric sedans from CARB-aligned OEM's such as the Ford Fusion hybrid or other hybrids rather than the Toyota Prius. In addition, the Toyota Prius has a higher combined EPA rating (52 mpg) than the Ford Fusion (42 MPG). Furthermore, the Ford Fusion hybrid is scheduled to be discontinued by 2021. Honda's current product line of hybrid electric sedans is comprised of the Accord and Clarity models. The Accord is not on the State of California contract, the Clarity is a plug-in hybrid electric vehicle and both are more expensive than a Toyota Prius.

### Alternative Fuels

Alternative fuels are another strategy to reduce GHG emissions. In 2018, 55 percent of diesel purchased at the District was renewable diesel. Renewable diesel is manufactured using organic materials such as waste animal fat or used cooking oil. The manufacturing process produces a "drop-in," biogenic replacement for regular diesel fuel, but with lower tailpipe emissions, a reduction in emission component maintenance, and up to an 80 percent reduction in GHG emissions over its lifecycle compared to petroleum-based diesel. Renewable diesel is the next evolution of bio-diesel, but without the maintenance, fuel stability, and storage tank challenges associated. The District will continue to expand its use of renewable diesel.

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