EBMUD

BOARD OF DIRECTORS
EAST BAY MUNICIPAL UTILITY DISTRICT

375 – 11th Street, Oakland, CA 94607 Office of the Secretary: (510) 287-0440

AGENDA
Sustainability/Energy Committee
Tuesday, October 27, 2017
9:00 a.m.
Training Resource Center

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

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. Fiscal Year 2015 Sustainability Report (Sykes)
2. Food Waste Program Update (Horenstein)
3. 2014 Greenhouse Gas Inventory and Mitigation Efforts (Wallis)

ADJOURNMENT:

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: October 22, 2015

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager

FROM: Richard G. Sykes, Director of Water and Natural Resources

SUBJECT: Fiscal Year 2015 Sustainability Report

INTRODUCTION

In 2008, the District first adopted its policy on sustainability, which has since been revised several times and most recently at the September 22, 2015 Board meeting. The policy defines sustainability as "using resources (economic, environmental, and human) in a responsible manner to meet the needs of today without compromising the ability of future generations to meet the needs of tomorrow." This definition incorporates the "triple bottom line" (TBL) concept of environmental, social, and economic sustainability to address multiple objectives in a balanced manner. This commitment has been further reinforced by the newly adopted values for the District, leading with stewardship, with sustainability as a key element.

The American Water Works Association recently released the results of a North American survey entitled "The State of Water/Wastewater Utility Sustainability." It revealed an industry that remains in its infancy with respect to widespread adoption of sustainability practices at either a policy or operational level. In this context, EBMUD has taken a number of significant steps that reflect a strong commitment to sustainability, surpassing most of its peers. However, the District still lacks a comprehensive set of metrics or indices to gauge its efforts and progress. This will be the subject of continuing investigation as the field matures. Staff will make a presentation on the Fiscal Year 2015 (FY15) Sustainability Report to the Board Sustainability/Energy Committee at its meeting on October 27, 2015.

SUMMARY

This report features two sections, including: 1) highlights of programs and actions in FY15 that demonstrate significant progress in sustainability at EBMUD; and 2) specific areas of focus for development in FY16. The FY15 accomplishments were selected for their visibility, commitment of resources, and demonstrated sustainability. In addition, they collectively encompass all three elements of the TBL. The second section identifies aggressive but achievable goals for FY16 that will require new approaches to achieving sustainability.

DISCUSSION

FY15 Accomplishments

Drought Management: In FY15, the extended drought was the defining feature of EBMUD's business, and posed one of the most difficult and sustained challenges that the District has faced in recent years. Despite extreme conditions, including a historic low Sierra snowpack, EBMUD succeeded in managing demand and securing supplemental supplies to maintain reliable, high quality water supplies for our customers. During FY15, EBMUD's demand management yielded savings of 45,000 acre-feet. East Bay homeowners made use of the District's lawn conversion rebate program to remove nearly 1.25 million square feet of lawns, and large irrigation customers slashed their use by more than 40 percent.

EBMUD's expanding recycled water program began delivering 150,000-200,000 gallons a day to the Oakland Airport, contributing to a total of 8.2 million gallons a day (MGD) in recycled water production and marking steady progress toward its overall 2040 goal of 20 MGD. The recycled water commercial truck program grew significantly in FY15, offsetting about 2 million gallons of potable water for use in construction projects and other non-drinking uses. Pipeline construction projects were also initiated which will deliver an additional 0.5 MGD of recycled water starting in 2016.

District staff designed and had constructed a new pipeline to carry recycled water from the second floor bathrooms in the Administration Building to supply the roof-mounted Auxiliary Cooling Tower (ACT) as part of a pilot project. Currently, the ACT is using a 50/50 mixture of potable and recycled water for an estimated 11 percent savings on the building's total annual water use of 3 million gallons.

EBMUD further augmented its supplies by negotiating transfers of 25,000 acre-feet from Placer County Water Agency and two irrigation districts on the Sacramento River, supplementing the 33,000 acre-feet of supply available under EBMUD's Central Valley Project contract. These drought management actions put the District in a far better position to weather potential water shortages in 2016. These supplemental supplies not only preserve water in Pardee and Camanche Reservoirs, the supplemental supplies include a "gainsharing" provision whereby 20 percent of the yield is assigned for fishery resource benefit on the Mokelumne River. Currently that "gainshare" water is being used to conduct pulse flows to attract upmigrating salmon this fall.

Collectively, EBMUD's efforts toward conservation, recycling, and supplemental supplies were critical to ensuring a sustainable solution to the drought.

Energy Management: In 2014, the District adopted aggressive goals for reducing greenhouse gas (GHG) emissions by 2040 – a 100 percent reduction in indirect emissions (mainly from electricity use), and a 50 percent reduction in direct emissions (mainly from fuel combustion in district vehicles and equipment). While pumping supplemental supplies at Freeport led to

increased emissions in FY15, the overall trajectory of GHG emissions since 2008 is on track to meet the 2040 goal.

In addition to treating wastewater from 650,000 customers in the East Bay, EBMUD's Main Wastewater Treatment Plant (MWWTP) helps recover valuable resources from the wastewater in the form of nutrients, recycled water, and green energy. Biodegradable material from sewage, food scraps, grease from local restaurants, and waste from wineries and poultry farms are mixed together in large tanks and digested by microorganisms. The biogas generated during the digestion process is captured and used to generate renewable electricity to power the MWWTP.

In FY15, the renewable electricity produced from biogas at the MWWTP was equivalent to 130 percent of the plant's power demand, exceeding EBMUD's key performance indicator of 100 percent. Excess power is currently sold to the Port of Oakland. The residual biosolids resulting from the digestion process are 100 percent beneficially reused through land application as a soil amendment and alternative daily cover at local landfills. The gross revenue from the Resource Recovery Program, which includes tipping fees from both low- and high-strength organic wastes, now exceeds $1 million per month.

Private Sewer Lateral Replacement: The Regional Private Sewer Lateral (PSL) Ordinance was implemented in 2011 to help drive repair of old, cracked sanitary sewer pipes to prevent infiltration of rainwater, which can overwhelm wastewater treatment facilities and lead to the release of partially treated wastewater into San Francisco Bay. The PSL Ordinance is a regional program that requires affected property owners to obtain a certificate from EBMUD certifying that all of their PSLs are free of leaks. The ordinance is triggered if a property owner is selling, reconstructing or remodeling at a cost greater than $100,000, or changing the meter size. Property owners may also voluntarily choose to have their laterals tested and certified. Since the PSL program began in 2011, approximately 16,100 compliance certificates have been issued. In FY14 and FY15, a total of 4,396 compliance certificates were issued. In June 2015, program compliance was 92 percent, exceeding EBMUD's key performance indicator of 90 percent. The cities of Albany and Alameda joined the PSL program on January 1, 2015. EBMUD staff is also expanding outreach to homeowner associations and properties with laterals longer than 1,000 feet.

Green Bonds: In June, the District issued its first-ever "green bonds" to finance $74 million of capital improvement projects. Green bonds are debt used to fund sustainable infrastructure. The District believes this is an emerging, valuable market and elected to be an early participant to stimulate its growth. A guidance document for issuing green bonds was approved by the Board in April 2015. Green projects have been defined as "activities that will promote progress on environmentally sustainable activities …." including:

- Sustainable water management (including clean and/or drinking water)
- Sustainable waste management
- Renewable energy and energy efficiency
- Sustainable land use and biodiversity conservation
- Clean transportation

Most District projects are arguably sustainable, but the guidance refines the standard to ensure projects meet some or all of ten criteria developed by the committee and are free of issues that have not yet been resolved (e.g., not optimizing the use of recycled materials). Staff reviewed FY15 capital improvement projects that were expected to be debt financed, and identified 20 projects that met the criteria laid out in the guidance. These projects are being financed by the green bond issue.

Salmon Returns: As a result of the 2008 Central Valley fall-run Chinook salmon population collapse, EBMUD, in cooperation with the Lower Mokelumne River Partnership, undertook a number of actions designed to recover the Mokelumne salmon population as quickly as possible. The actions were designed to improve migratory conditions and reduce straying of Mokelumne salmon to other systems.

The population response to the management actions implemented since 2008 has been remarkable. The stray rate has been reduced from 70 percent to approximately 25 percent, which not only improves the returns but also helps to protect the native Mokelumne fish stock as well as neighboring salmon stocks. Between 2009 and 2014, the Mokelumne had four of the best returns recorded since 1940, including a record return of over 18,000 salmon in 2011 and four consecutive years of returns topping 12,000 fish. Through EBMUD's actions, the average salmon returns to the river have doubled from 3,636 (1940 to 1997 average) to 8,774 (1998 – 2014). (Although the salmon return in 2015 is not within the FY15 time frame, the strong of successful years continued with a return of 12,117 fish.)

Estates Reservoir Replacement: This large project not only minimized temporary construction impacts, but also minimized visual impacts from the new tanks by incorporating native landscaping features that returned the site to its original open space character, and by developing a design that optimized the balance of cut and fill materials required during construction. The District required its contractors to recycle materials generated during the demolition process, such as concrete materials and rebar. These measures allowed the District to minimize the need for imported backfill materials, by storing and reusing excavated materials on-site, which minimized greenhouse gases and construction traffic in adjacent neighborhoods.

Bay Area Regional Reliability (BARR): In the spring of 2014, eight Bay Area water supply agencies (EBMUD, Contra Costa Water District, Santa Clara Valley Water District, San Francisco Public Utilities Commission, Zone 7 Water Agency, Alameda County Water District, Marin Municipal Water District and the Bay Area Water Supply and Conservation Agency) adopted the Bay Area Regional Reliability Principles (BARR Principles). EBMUD adopted the BARR Principles on May 27, 2014. The BARR Principles are intended to:

- Improve the Bay Area's regional water supply and water quality reliability through a regional partnership,
- Maximize the use of existing assets of partner agencies, and if needed, construct new ones to benefit near- and long-term reliability projects,
- Employ equitable cost, risk, and benefit sharing approach, and

- Conduct all work in a transparent, inclusive, mutually beneficial manner.

This coalition effort is included in the 2015 accomplishments because it demonstrates an unprecedented level of collaboration among regional water providers. It is a significant step toward an integration that will optimize the use of existing infrastructure and help identify future investments that will provide broad regional benefits.

FY16 Goals

Pipeline Rebuild: This is a signature program at EBMUD to dramatically accelerate the replacement of aging water distribution pipeline in the service area. Significant resources are being directed to pilot new approaches to this critical aspect of the District's infrastructure. Sustainability is one of the key emphases in the expanded pipeline replacement effort, which is highly resource intensive and connected to all the elements of the triple bottom line. In FY16, Pipeline Rebuild will:

- Calculate GHG emissions of pipeline replacement alternatives;
- Conduct an analysis of different pipe materials to meet multiple objectives of performance, safety, environmental and community impact, and long-term cost; and
- Continue to pilot an interdepartmental team structure that eliminates siloes and creates new synergies.

Trench Spoils Master Plan: The generation of trench spoils is anticipated to increase by 50 percent by FY17 as the Pipeline Rebuild program accelerates the rate of pipeline replacement. The Trench Spoils Master Plan update will address the remaining spoils capacity at District owned disposal sites and identify options for long term management and efficient use of the District's sites, including options for trench spoils reuse and techniques to minimize the production of trench spoils. This in turn will help reduce the transport costs, GHG emissions, and community impacts associated with trench spoils production, hauling, and storage.

Renewable Energy: In 2014, the District completed a feasibility study of adding photovoltaic (PV) projects at District facilities under Pacific Gas and Electric Company's Net Energy Metering (NEM) tariff and a new NEM-Aggregate tariff. Net energy metering allows the District to offset the cost of electricity use at one account with the excess energy generated and sent back to PG&E. The aggregate tariff allows the District to apply net energy metering to multiple accounts.

The study identified five projects, and in December 2014 a Request for Proposals (RFP) was issued for those sites for a power purchase agreement and direct purchase of PV systems. Based on the RFP, staff recommended entering into agreements at Norris Reservoir, North Richmond Water Reclamation Plant and the Camanche Dam site, and recommended the direct purchase of a PV system at the Oakport Storage/Oakport Wet Weather Treatment Plant. The total PV capacity for the new systems would be 1,013 kilowatts (kW) and would bring the District total PV capacity to 700 kW for systems owned by the District and 1,559 kW for systems under power purchase agreements.

"Envision" Sustainable Infrastructure Rating System: Envision was developed by the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure, and provides a comprehensive framework for evaluating and rating the community, environmental and economic benefits of infrastructure projects. It includes a framework of criteria and performance objectives to identify sustainable approaches during planning, design, construction, and operation. It also offers optional third-party verification and awards for recognizing project achievements. While EBMUD is already implementing many of the approaches advocated by Envision, the tool will help further formalize design approaches. Several District staff have been or will soon be certified in implementing the Envision process, and will pilot the system on select projects.

Panoramic Hills: This project is scheduled to start this fall and will take about three years to complete. It includes an orchestrated effort to upgrade the pipelines, pumping plant, and reservoir facilities serving a historic neighborhood in the Berkeley hills. To reduce community and environmental impacts, EBMUD is closely coordinating work with the community and also the City of Berkeley's sewer upgrade and repaving efforts. Sustainable components include use of trenchless technology to minimize construction impacts, by slip-lining an old water main located under the Orchard Lane stairs to preserve a pedestrian path of historic significance.

Food Waste Green Energy: EBMUD is expanding the Resource Recovery program to capture energy and recycle nutrients in food scraps that are discarded within Oakland and other nearby communities. EBMUD plans to expand its food waste processing and digestion over the next few years through contracts with two project partners. The District is negotiating with Harvest Power, an organics and renewable energy specialty firm, to provide preprocessing services to remove contaminants from food waste in Oakland so it is made suitable for anaerobic digestion. Another impact of the agreement will be for Harvest Power to work with the District to find and obtain other organics sources to supplement Oakland food waste and grow the program. A facility to refine the biogas from food waste into compressed natural gas is also being considered which could be used as transportation fuel, thus expanding the District's green energy portfolio. Separately, District staff entered into a contract with Recology, the waste hauler for the City of San Francisco, to accept preprocessed organics extracted from municipal solid waste from San Francisco for anaerobic digestion. The Recology project, which will begin as a pilot in fall 2015, will bring in approximately 70 tons per day, with plans for expansion.

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: October 22, 2015

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Bennett K. Horenstein, Director of Wastewater BH

SUBJECT: Food Waste Program Update

SUMMARY

The District is continuing to progress toward securing long-term partnerships for the anaerobic digestion of food waste delivered to the Main Wastewater Treatment Plant (MWWTP) for renewable energy production. The Board authorized a contract with Recology for delivery of preprocessed urban organics from San Francisco on October 13. Staff is also continuing to negotiate a contract with Harvest Power to develop a project that would provide the required preprocessing (i.e., contaminant removal, size reduction) of City of Oakland material delivered through the contract with Waste Management of Alameda County, as well as digested food waste dewatering and compressed natural gas (CNG) production facilities. Staff will provide an update to the Sustainability/Energy Committee on October 27, 2015.

DISCUSSION

On June 23, 2015, the Board approved a memorandum of understanding (MOU) with Harvest Power to design, construct, and operate food waste processing facilities at the MWWTP. Staff continues to negotiate key financial, technical, operational, and legal contract terms. Under the contract model currently being negotiated, the District will provide all of the capital financing to fund the project and will own all project facilities and equipment. Harvest Power will design and build the facilities and will assume risk for meeting the project schedule and performance indicators. Harvest Power will have overall operational responsibilities for the three facilities (preprocessing, dewatering, and CNG) while utilizing District labor to operate and maintain the dewatering and CNG facilities. Harvest Power will also provide support in developing agreements for sources of feedstock, offtake of the CNG, and sale of the environmental attributes associated with the CNG. The District will pay Harvest Power fees for services delivered under the contract, including an operations and maintenance fee. District and Harvest Power staff are also currently negotiating a commercial performance fee that would align incentives such that Harvest Power receives some share of project net revenues based on project performance.

Preprocessing equipment has been identified as a notable technology risk area for both the Harvest Power and Recology projects. To better understand and mitigate/manage this risk, staff is planning to conduct technology evaluation site visits. The purpose of the site visits is to

observe facilities that have been in operation for several years preprocessing food waste and digesting the cleaned feedstock. Three District staff, from wastewater engineering and operations, will observe the equipment in operation and meet with technical and field staff at each facility to gather information on key lessons learned, including operations and maintenance requirements, downtime, contaminant removal, odor control, and other considerations. As there are currently no comparable equipment installations in North America, staff will travel to Italy, where this technology has been in use for a number of years. Staff plans to visit five facilities that are operating equipment being considered in the Harvest Power and Recology projects.

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EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: October 22, 2015

MEMO TO: Board of Directors

THROUGH: Alexander R. Coate, General Manager ARC

FROM: Michael J. Wallis, Director of Operations and Maintenance MJW

SUBJECT: 2014 Greenhouse Gas Inventory and Mitigation Efforts

INTRODUCTION

An objective of District Policy 7.05, Sustainability, is to identify projects and plans that mitigate climate change impacts and reduce greenhouse gas (GHG) emissions. District Policy 7.07, Energy, includes the goals to be carbon free for indirect emissions and to achieve a 50 percent reduction in direct emissions compared to 2000 levels by 2040. This memo provides a summary of the District's 2014 GHG emissions inventory and progress towards the District's GHG emissions goals. These items will be discussed at the October 27, 2015 Sustainability/Energy Committee meeting.

SUMMARY

The District has been tracking and reporting its GHG emissions since 2005. GHG emissions are calculated according to generally accepted protocols. In 2014, the District's GHG emissions totaled 37,235 metric tons of carbon dioxide equivalent (MT CO_2^e) which represents an 18 percent reduction from year 2000 levels, but a 19 percent increase from the 2013 emissions inventory (31,244 MT). The District's GHG emissions were below the goal for 2014. Staff continues to investigate alternatives and implement measures to reduce GHG emissions.

DISCUSSION

There are many factors that affect the District's GHG emissions and some of those factors are outside the District's control. GHG emissions are comprised of indirect and direct emissions. The District's indirect emissions result from the use of electricity and direct emissions result from the combustion of fuel in stationary and mobile equipment. Direct emissions are calculated using the total annual fuel consumption multiplied by an emissions factor (pounds of CO_2/gallon of fuels used) for the specific fuel used (i.e., propane, natural gas, gasoline, or diesel). Indirect emissions are calculated using the annual electrical use multiplied by an emissions factor (pounds of CO_2/kWh) for the electricity source. The emissions factor is dependent on the fuel used by the electrical utility for generation.

GHG Emissions on a Sector-Specific Basis

The District's GHG emissions inventory can be categorized into five sectors representing major areas of operations. The table below summarizes the 2014 GHG emissions for each of these sectors. In 2014, the Treatment and Distribution sector was the most significant source of GHG emissions. The Raw Water sector varies significantly from year-to-year based on operation of raw water pumps and was higher in 2014 due to the operation of the Folsom South Canal Connection.

Sector	Direct GHG Emissions (MT)	Indirect GHG Emissions (MT)	Percent of Total Emissions
Treatment and Distribution	0	16,625	45%
Wastewater	512	2,613	8%
Fleet	6,706	0	18%
Buildings	2,816	1,430	11%
Raw Water	0	6,534	18%
Total	10,034	27,202	100%

Direct Emissions Goal

The District's 2014 direct emissions were 10,034 MT CO_2^e, which is 421 MT CO_2^e over the District's 2014 direct emissions goal based on Policy 7.07 to be less than 9,613 MT CO_2^e. Staff has made efforts to reduce direct emissions including purchasing more efficient vehicles and alternative fueled vehicles as well as reducing vehicle miles traveled. Staff is also working with District units and outside agencies to reduce the vehicle miles traveled for the District's fleet. A satellite fleet facility in Walnut Creek was purchased and is being constructed to reduce the miles traveled for vehicles and equipment.

In 2015, the District installed a new fuel management system to effectively measure and manage fuel use. Standard reports have been developed to track fuel use by budget unit, vehicle, and vehicle class. These reports will be used to evaluate alternative operations and equipment to maximize fuel efficiency. There are currently limited opportunities for low and zero emissions heavy duty vehicles such as alternative fuels and fleet electrification. Senate Bill 1204 was signed by Governor Brown in September 2014 to create the California Clean Truck, Bus, and Off-Road Vehicle and Equipment Technology Program. SB1204 allocated cap-and-trade fee revenue to various incentives for alternate-fueled buses, trucks, and off-road equipment. The purpose of the program is to support the development, demonstration, pre-commercial pilot, and early commercial deployment of zero and near-zero emission technologies, with priority given to projects that benefit disadvantaged communities. In June 2015, the California Air Resources Board approved $373 million to fund all investments in advanced technologies for fiscal year 2015-16. This includes $148 million for SB1204 projects. Staff will follow developments of this program throughout the year.

Indirect Emissions Goal

The District's 2014 indirect emissions was 27,202 MT CO_2^e, which is less than the District's 2014 indirect emissions goal to be less than 30,584 MT CO_2^e based on Policy 7.07.

In 2015, the operation of the Folsom South Canal facilities and the raw water pumping plants and the conventional water treatment plants (Sobrante, San Pablo, and USL) will require a significant amount of power. The increase in power use is estimated to increase indirect emissions in 2015 by 2,000 to 8,000 MT CO_2^e over the overall GHG emissions goal for 2015 depending on the amount of energy used to pump water to the service area. To meet the 2015 GHG goal, Policy 7.07 directs staff to utilize the least-cost option to achieve the GHG goals, which currently would be the purchase of tradable renewable energy credits (TRECs). TRECS are non-tangible energy commodities that represent one megawatt-hour of power produced from a renewable energy source.

FISCAL IMPACT

Purchasing TRECs to offset the projected overage in 2015 is estimated to cost between $10,000 and $50,000 in FY16. These costs can be accommodated within the existing budget.

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