



GREEN BUSINESS REPORT – FY20

I. Agency Recycling

Item	Description	Recycling Measurement	Quantity
1) Paper	Paper cups, plates, printer paper, newspaper, magazines, and other paper-based materials are separately disposed of in office containers, collected by staff and transferred to 64-gallon bins that are picked up and recycled weekly by Marin Sanitary Service.	# of 64 gallon bins	64 <i>FY19 - 62</i>
2) Aluminum and Plastic	Aluminum cans and plastic containers (labeled #1-#7) are deposited by employees in bins outside the Agency lunchroom, and they are picked up and recycled weekly by Marin Sanitary Service.	# of 64 gallon bins	40 <i>FY19 - 40</i>
3) Scrap Metal	Iron, steel, and related metals are collected in 20-yard bins and then recycled, typically four times per year, by Marin Sanitary Service.	lbs. of metal	114,200 <i>FY19 -120,000</i>
4) Cardboard	Waste cardboard boxes, packing, and similar material are collected in a 3-yard dumpster. Marin Sanitary Service picks up the dumpster weekly and recycles the materials.	# of 3 yard bins	52 <i>FY19 - 52</i>
5) Green Waste	Grass clippings, tree branches, and trimmings from landscaping activities are deposited in 3-yard dumpsters, picked up weekly by Marin Sanitary Service, and used in a composting operation.	# of 3 yard bins	52 <i>FY19 - 52</i>

II. Reused Agency Products

Metric	Definition	Reuse Measurement	Quantity
1) Recycled Water	Treated wastewater that is reused for Agency landscape irrigation, tank wash down, and cogeneration engine cooling, used offsite at the Remillard Pond, and delivered through the Agency's truck fill station.	million gallons/year % of effluent	397.4 8.7% <i>FY19 – 9.3%</i>
2) Biosolids	Treated biosolids that are beneficially reused as: - alternate daily cover at Redwood landfill - soil amendment/fertilizer for land application - biofertilizer production for agricultural use	wet tons/year wet tons/year wet tons/year	3,267.1 857.5 1,902.8
3) Biogas	Biogas generated in the Agency's anaerobic digesters is used for fuel in an engine-generator to produce on-site electricity.	Million ft ³ of biogas	99.2 <i>FY 19 – 100.7</i>



III. Hazardous Material Collection and Disposal

Metric	Description	Recycling Measurement	Quantity
1) Oils and Lubricants	Used oils and lubricants from CMSA equipment, vehicles, and engine-generators are collected and stored in a waste oil facility. The supplier periodically collects the materials for recycling.	gallons	Oil: 625 <i>FY 19 – 1,045</i> Coolant: 200 <i>FY 19 – 640</i>
2) Mercury	Collected mercury containing devices: - amalgam waste at dental offices is collected and disposed of by certified haulers - fluorescent tubes are collected by the public education program agencies - mercury thermometers exchanged for digital thermometers by the public ed agencies	kg linear feet # of thermometers	5.56 53,075 20
3) Pharmaceuticals	Old or unused pharmaceuticals are brought to pharmacies and police stations by the public for proper disposal. CMSA and the Marin County public education program agencies fund the collection and disposal expenses, and the program is administered by the Marin County Environmental Health Department.	lbs. of pharmaceuticals	10,000 <i>FY 19 – 8,500</i>
4) Batteries	Depleted, used, or damaged batteries collected by staff and brought to a Hazardous Waste facility and Interstate Battery. Sources of batteries include: - Agency vehicles - Devices (AA, C, D, 9V, etc.) and employee batteries brought from home	# of batteries lbs.	55 110
5) Electronic Waste	Electronic products that contain toxic materials, from Agency facilities and employees - cell phones, computers, computer monitors, process instrumentation, etc. – are collected and stored on-site, then periodically disposed of at the Marin Hazardous Household Waste Facility.	# of devices	216 <i>FY 19 - 227</i>
6) Herbicides	The Agency uses the same types of herbicide products utilized by the County of Marin as part of their Integrated Pest Management Program, and over the past year has minimized/eliminated the use of pesticides and fungicides. Waste products are disposed of at the Marin Sanitary Service Household Hazardous Waste Facility.	gallons/lbs	Herbicide: 3.28 <i>(liquid)</i> Herbicide: 40 lbs <i>(solid)</i>



IV. Green Activities

Metric	Description	Environmental Benefit
1) Potable Water Conservation	High-efficiency water fixtures have been installed in all Agency facilities and buildings. Staff records the Agency’s daily potable water use.	Potable water use was 81,831 gal <i>FY19</i> – 185,512 gal
2) Green Commuting	Programs encourage employees to use alternate commute methods such as carpool, biking, public transit, etc., when convenient and affordable for Agency employees. Administrative procedures are in place to assist in registering, tracking, and utilizing these modes of transportation.	Six Agency employees participated in the program, which reduces the number of vehicles on roads during commute hours, emissions, and fossil fuel use.
3) Spare the Air Days	Participation in the Bay Area Air Quality Management District’s Spare the Air Day program. The Agency does not use gasoline fueled landscape maintenance equipment on these specified days.	26 days that resulted in lower emissions and GHG reduction
4) Increased Digital Document Management	Digital and email correspondence to replace hard copy mailing. Many agency documents are now posted on the Agency website for viewing.	Reduced use of paper, toner, and postage
5) Green Vehicle Fleet	Agency staff use bicycles and electric carts to travel around Agency property and within the treatment plant, and 24% of Agency vehicles are alternate fuel – Hybrids.	Fuel savings and reduced GHG emissions
6) Water Fill Station	A water fountain/bottle fill station was installed in the Administration Building for staff to fill water bottles to replace the purchase of plastic water bottles.	4,356 16oz water containers filled

V. Energy Saving Activities

Project/Initiative	Description of Energy Saving Aspect of initiative
1) PG&E Interconnection Agreement Modification Project and Power Delivery	<p>CMSA’s electrical cogeneration system currently powered the Agency’s facilities for an average 22-23 hours per day with biogas as its fuel source. After the unfortunate failure of the cogeneration engine in late May 2019, an identical refurbished cogeneration engine was purchased and installed in FY20, and in parallel staff initiated and almost completed the final design phase for a new and more efficient cogeneration system. As part of this project, we also selected and pre-purchased a new, larger capacity cogeneration engine which arrived at CMSA on August 20 and will be installed in FY21. The PG&E interconnection agreement process for the new system is nearly completed, and we submitted a second power purchase agreement application to MCE for the additional renewable energy delivery.</p> <p>In FY20, CMSA also completed significant progress in the Digester Organic Loading Study, including starting the system up and operating it continuously since October 2019. The study will continue into FY21 and is intended to answer the question about how much additional external organic waste can be accepted in CMSA’s digestion system, an important consideration for CMSA’s long-term planning of future phases its power delivery program.</p>



VI. Energy Saving Activities, cont.

Project/Initiative	Description of energy saving aspect of initiative
<p>2) Power Monitoring Equipment</p>	<p>CMSA has installed over 70 power monitoring devices for each building and process, and on critical equipment. This collected data is logged and reviewed by staff and the Agency’s Energy Efficiency Committee on a monthly basis, and automated power monitoring reports are routinely published and shared with staff. Graphs, generated in real-time showing how much electricity was purchased and how much biogas-generated electricity was exported and sold, are posted on the Agency website and are displayed on screens in the Agency lobby and Operations Control Room. In FY20, CMSA successfully implemented energy efficiency measurements of our digester mixing system, and improved energy efficiency by roughly 20%, saving approximately 67,000 kW of electricity annually. The power monitoring system has been proven to play a vital role in operational decision making.</p>
<p>3) Lighting System Replacement</p>	<p>The Agency has a multi-year program to replace fluorescent, incandescent, and metal halide fixtures/bulbs throughout the Agency’s facilities with energy-efficient lighting – electronic ballast fluorescents or LEDs. In FY20, staff replaced a total of 24 fixtures and retrofitted 138 existing fixtures to LED. Pendants and ceiling fixtures were replaced in the Solids Handling Building Load Bay and Headworks Grit Load Bay, and exterior wall sconces were replaced on the Effluent Pump Station (EPS) Building. Fluorescent fixtures retrofitted to LED lighting were completed in various locations in the Administration Building, Headworks Grit Tank Room, Effluent Pump Station Building, and various locations inside the Solids Handling Building. These energy wise upgrades will save the Agency and additional 72,629 kWh of electricity annually.</p>
<p>4) Energy Generation</p>	<p>The Agency uses a cogeneration system comprised of an internal combustion engine coupled to a generator to produce over 95% of the Agency’s energy needs. The system is fueled by biogas generated in the Agency’s anaerobic digesters and purchased natural gas; a small amount of utility electricity is purchased to minimize system disruptions when energy demand instantaneously changes. For FY20, metrics for energy generation and the resulting electricity procurement savings are:</p> <ul style="list-style-type: none"> - <i>Biogas generation (from Table 2):</i> 99,177,890 cubic feet - <i>Natural gas purchase:</i> 71,823 therms - <i>Annual energy costs without cogeneration:</i> \$ 738,287 (assumes purchasing all electricity) - <i>Electricity savings due to cogeneration:</i> \$ 638,059 (use of biogas and natural gas as cogeneration fuel) - <i>Electricity savings due to biogas use:</i> \$ 560,958 (value of biogas used as engine fuel)