Calendar Year 2022 Greenhouse Gas Inventory

Sustainability Committee
November 14, 2023

Agenda

- District policies for GHGs
- Water-Energy Nexus Protocol
- 2022 GHG Inventory Results
- Next Steps

GHG = greenhouse gas

Energy Policy and GHG Inventory Protocol

Energy Policy 7.07 (updated September 26, 2023)

- District goal is to be carbon neutral by 2030
- Prioritize actual emission reductions
- Purchase credits to mitigate residual emissions
- Track process emissions but not included in goal

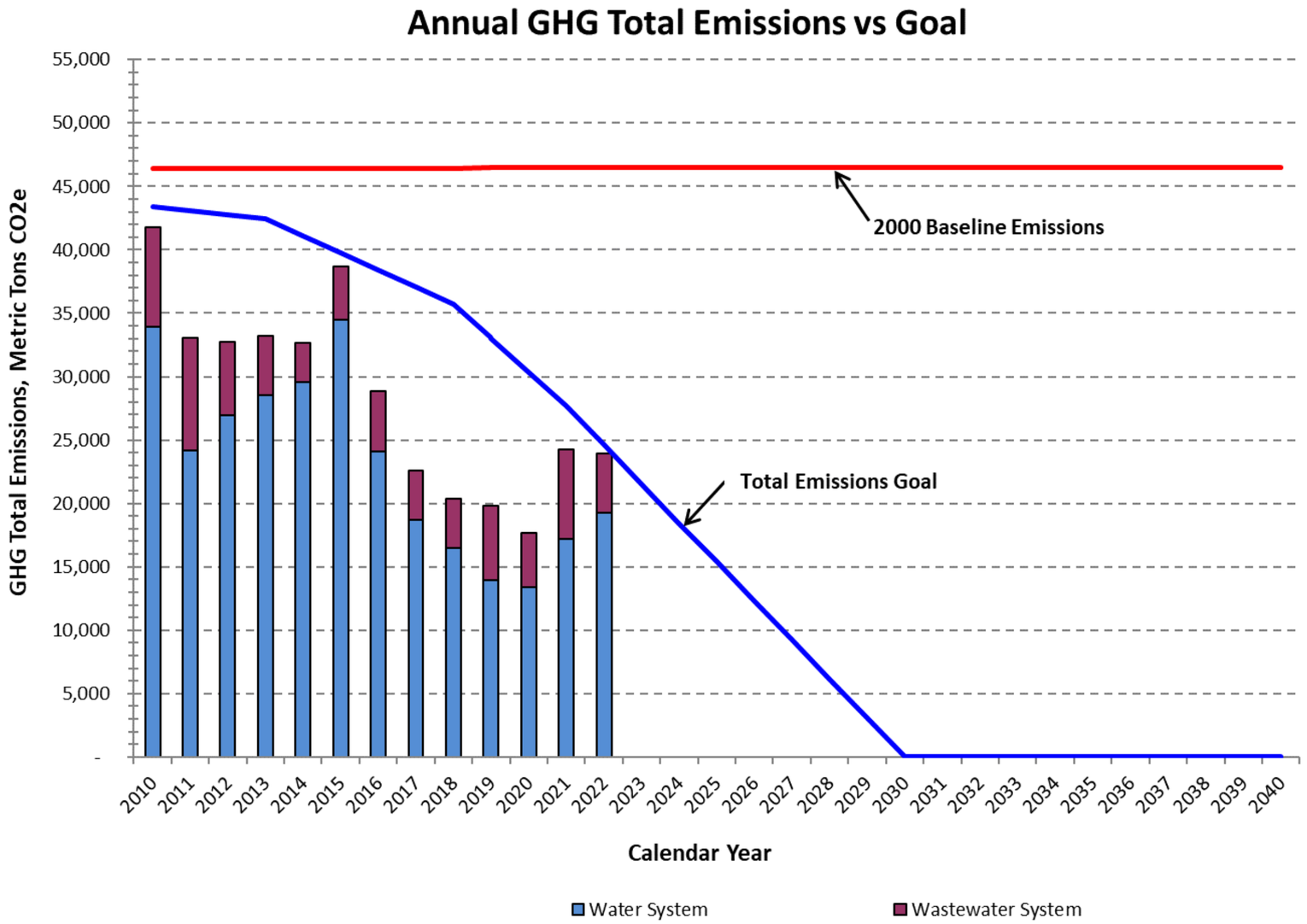
WEN 2.0 used to estimate GHG inventory

- All past year GHG data revised to match WEN 2.0
- Allows more precise year-to-year comparison

Climate registry logo

WEN = Water Energy Nexus

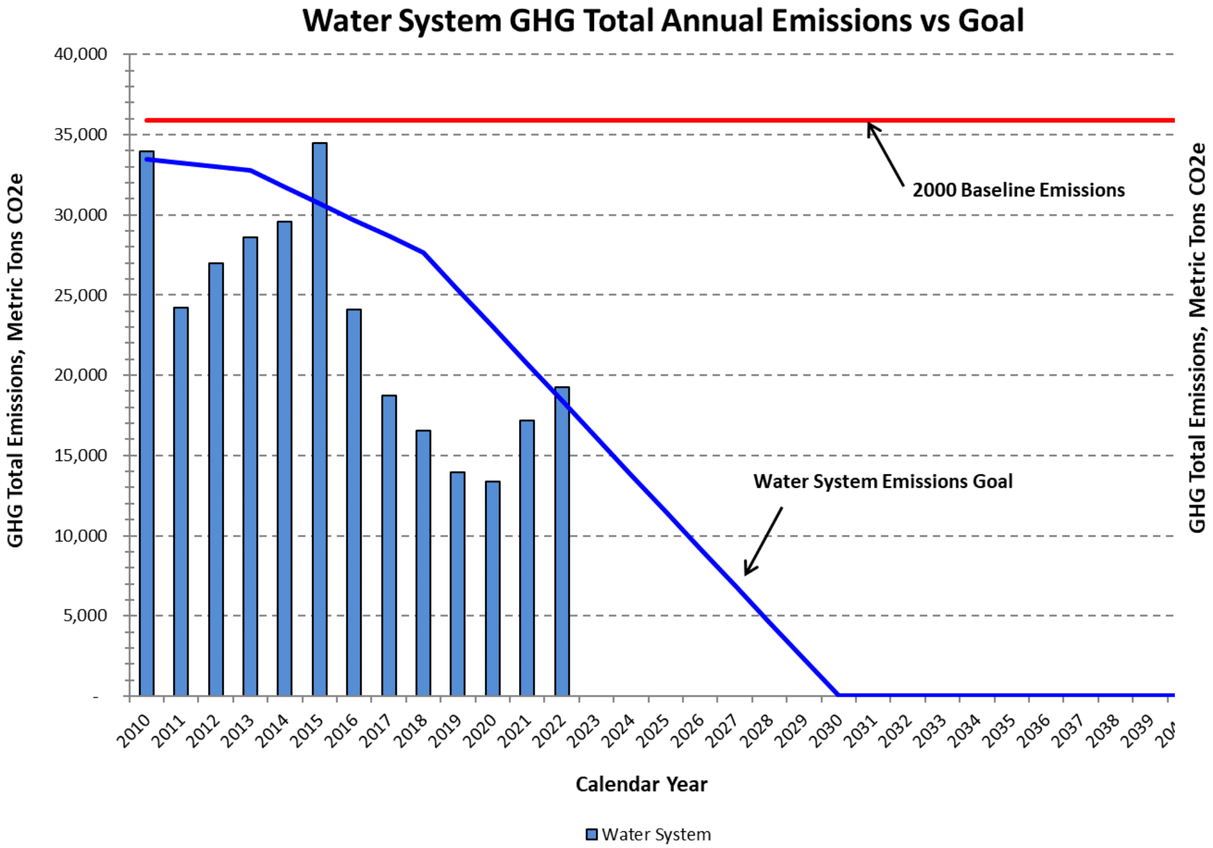
District GHG Emissions

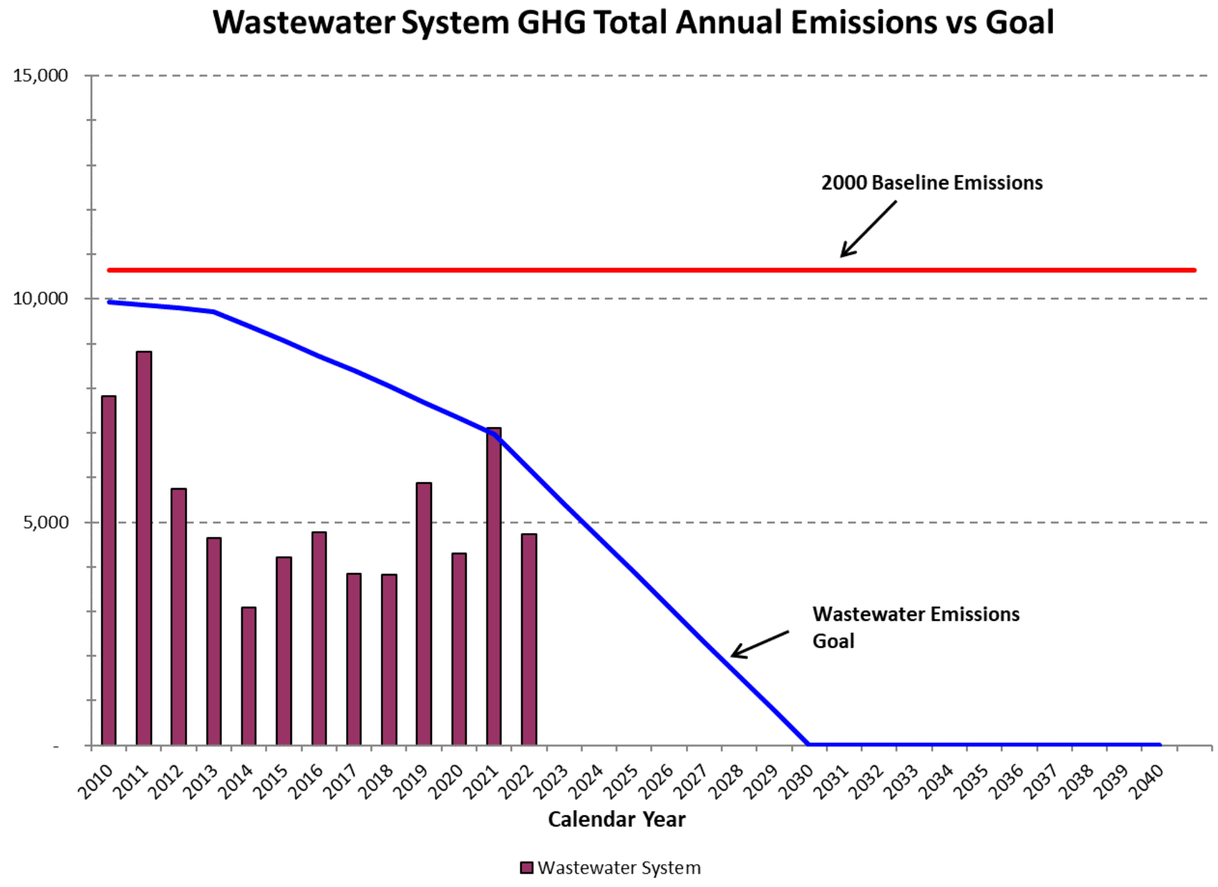


2022 Emissions	2022 Goal
23,968 MT CO2e	24,611 MT CO2e

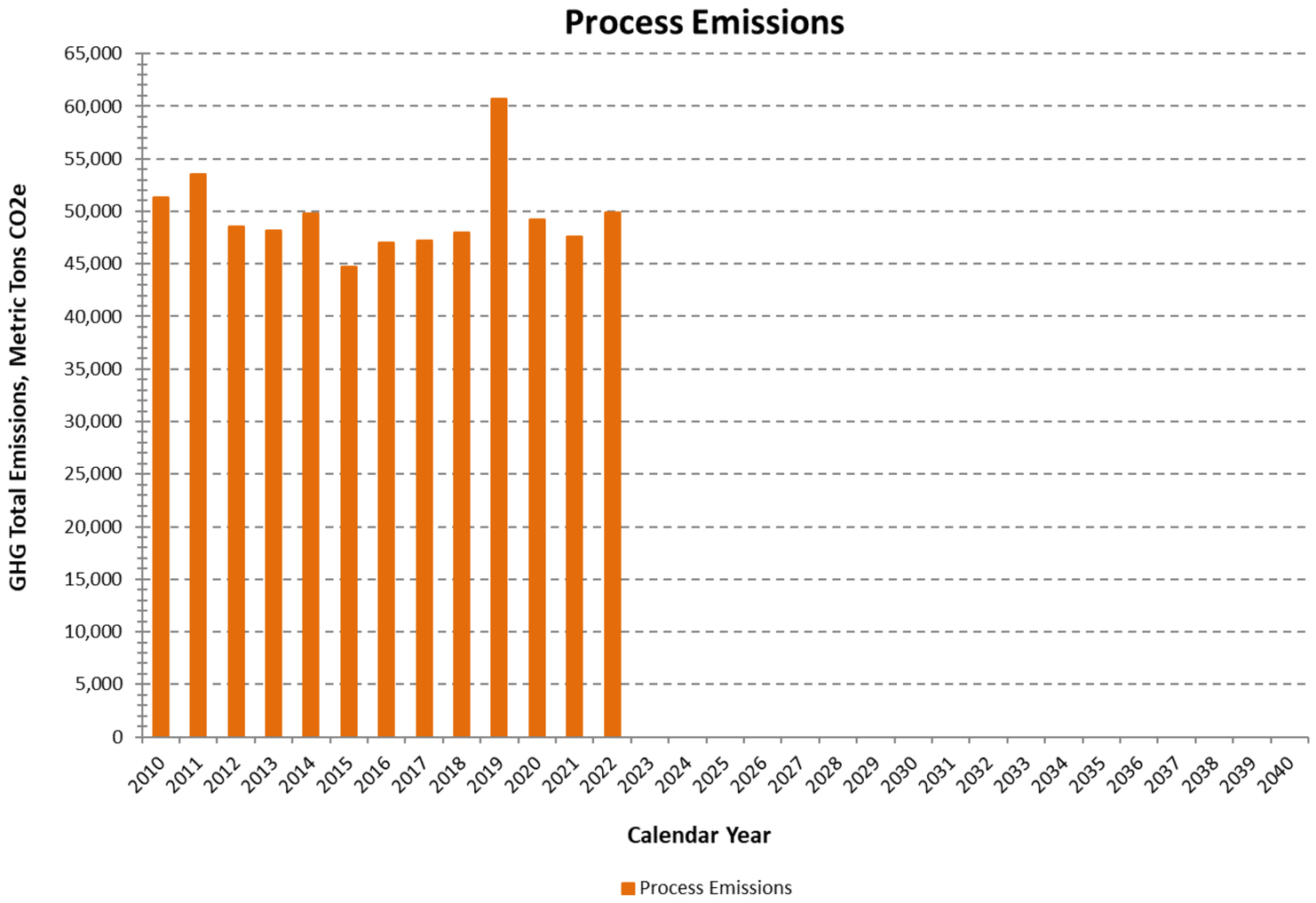
MT CO2e = Metric Tons of Carbon Dioxide equivalent

Water and Wastewater GHG Emissions





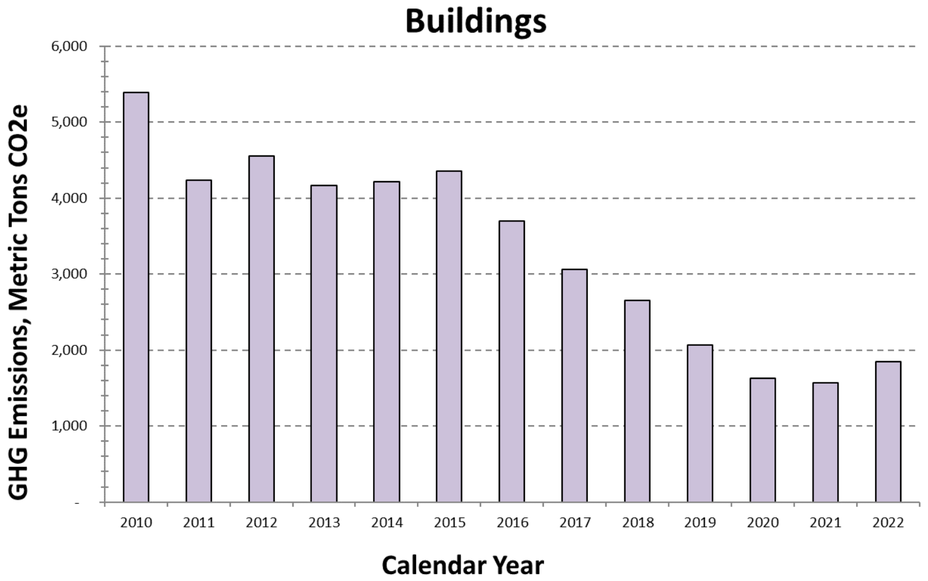
Process GHG Emissions

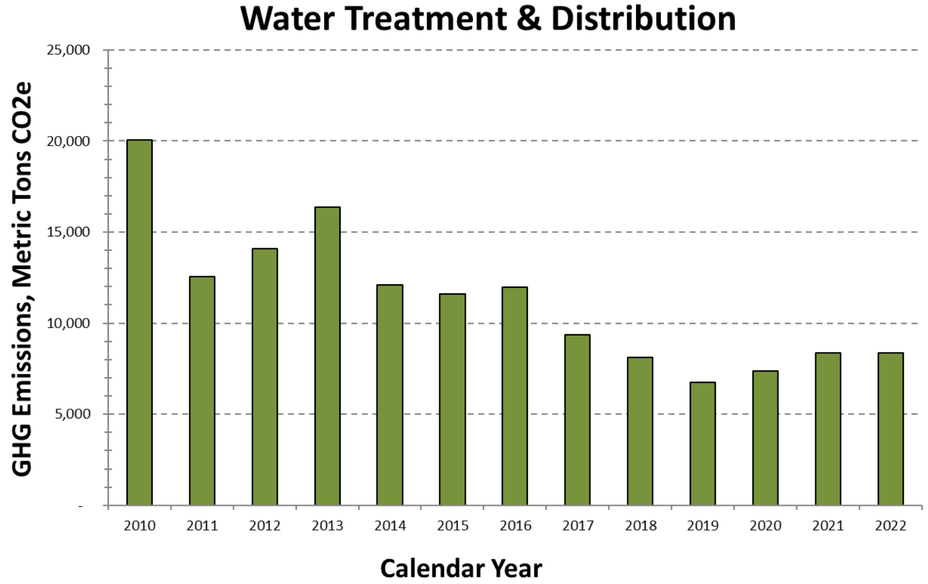


Process emissions include methane and nitrous oxide from wastewater treatment.

These estimates are uncertain since the science is evolving in this area.

2022 Emission Profile by Sector





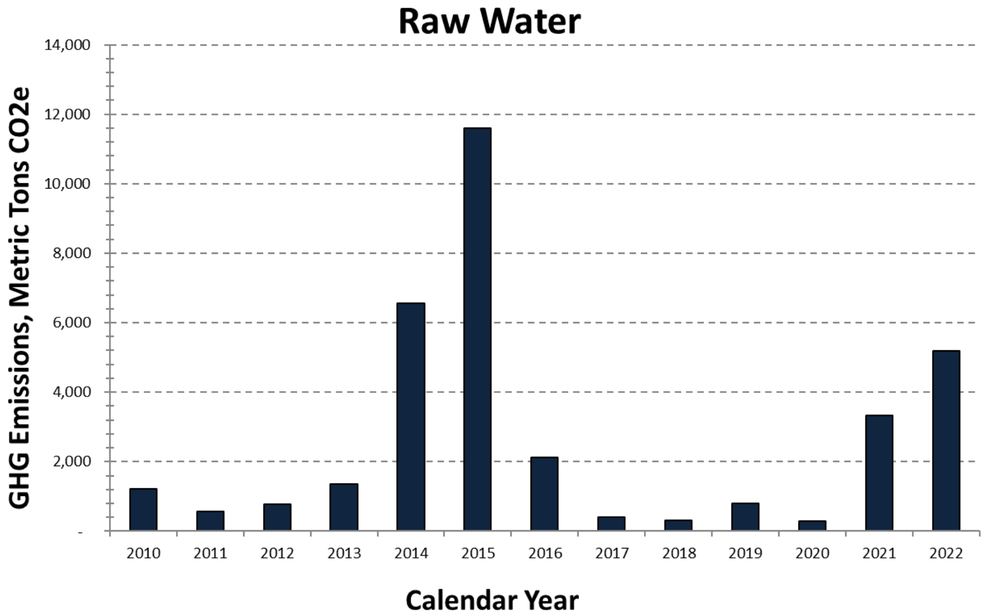
Buildings Emissions

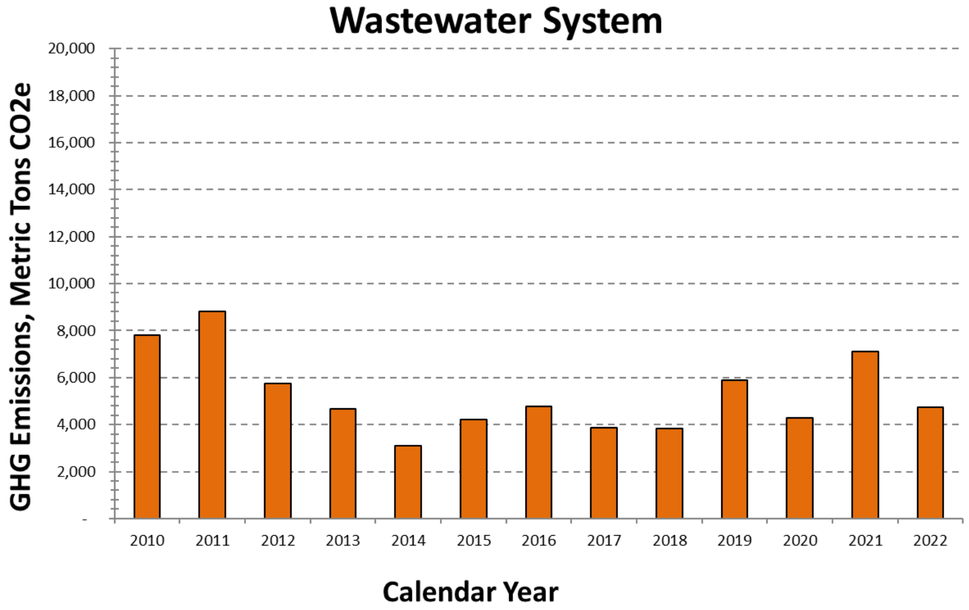
- Diesel Back-up Generators (35%)
- Natural gas (30%)
- Electricity (24%)
- Refrigerants/Combustion Byproducts (11%)

Water Treatment & Distribution Emissions

- Electricity (97%)
- Natural Gas (2%)
- Refrigerants/Combustion Byproducts (1%)

2022 Emission Profile by Sector





Raw Water Emissions

- Electricity (99%)
- Refrigerants (1%)

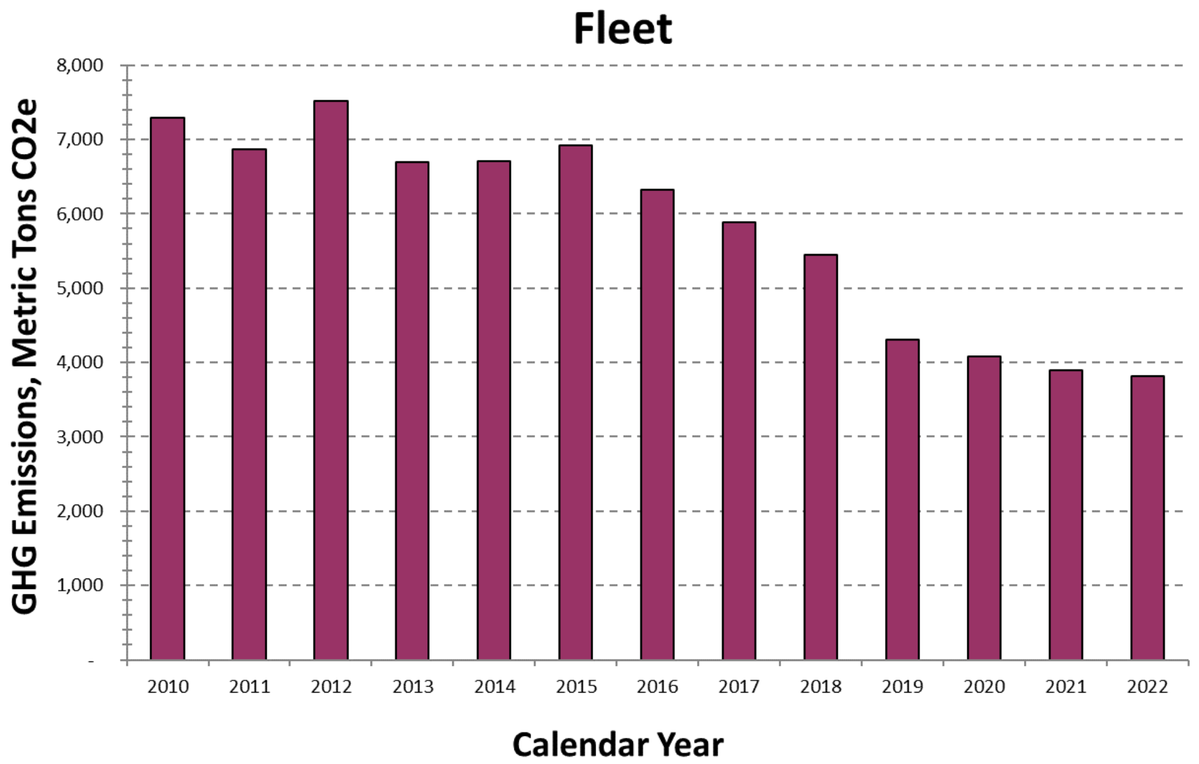
Wastewater Emissions

- Electricity (45%)
- Cogen Engine Methane (25%)
- Natural gas (19%)
- Refrigerants/Combustion Byproducts (6%)
- Cogen Diesel (5%)

2022 Emission Profile by Sector

Fleet Emissions

- Gasoline (95%)
- Diesel (3%)
- Combustion Byproducts (2%)



Zero Emission Vehicle (ZEVs) Status

- Currently 14 ZEVs in service (Chevy Bolts)
- Nine ZEVs on order (Ford Pick-ups and Vans)
  - Expected delivery first half of 2024
- Front End Loader pilot successful
  - Purchase pending approval, CORE grant funding utilized
- Additional medium/heavy duty pilot opportunities in 2024
  - Freightliner eCascadia Tractor
  - Hyzon Hydrogen Fuel Cell Tractor
  - Volvo Full Size Front End Loaders (if released)
- Future purchases must comply with or surpass the Advanced Clean Fleets Regulation

Piloted Front End Loader

2022 Trends and 2023 Forecasted Emissions

District-wide emissions reduced by 1% compared to 2021

Waterside emissions were higher

- Supplemental water supply pumping

Wastewater emissions were lower

- More equipment available for power generation using digester gas

2023 on pace to meet District goals

- 2023 District goal: 21,525 MT CO2e
- Estimated emissions: ~19,000 MT CO2e

Assumptions

- No supplemental water pumping in 2023
- Similar water demand compared to 2022
- Additional photovoltaic projects not on-line until 2024
- Similar emission factors from electrical providers

Next Steps

- Complete Duffel solar project
- Start construction on Oakport and Stockton solar projects (2024)
- Fleet ZEV
  - Begin converting fleet to ZEV, as equipment is available and appropriate
  - Continue planning for alternative fueling in service yards
- Continue involvement with research into emerging GHG issues
- Evaluate carbon credit options

Questions?

FLOWING
INTO
THE
FUTURE

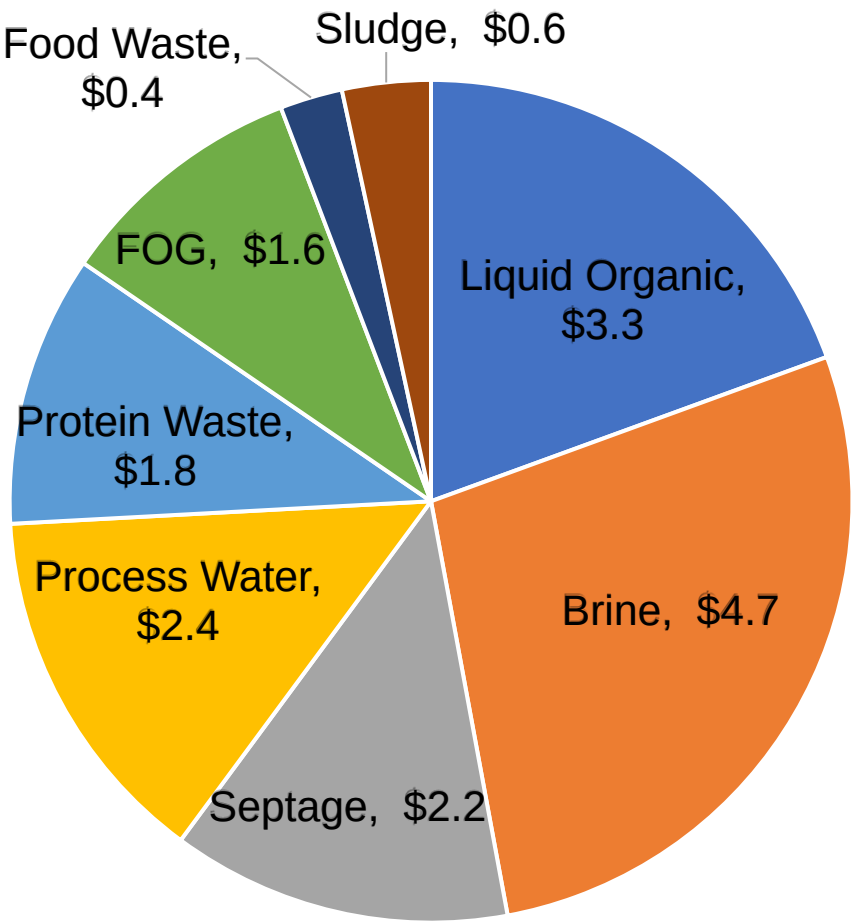
Resource Recovery Program Update

Sustainability Committee

November 14, 2023

R2 Program
FY 2023 Results

- Average 130 trucks/day
- $16.8 million in tip fee revenue
  - $7.0 million high strength
  - $9.8 million low strength



Revenue ($M)

R2 = Resource Recovery

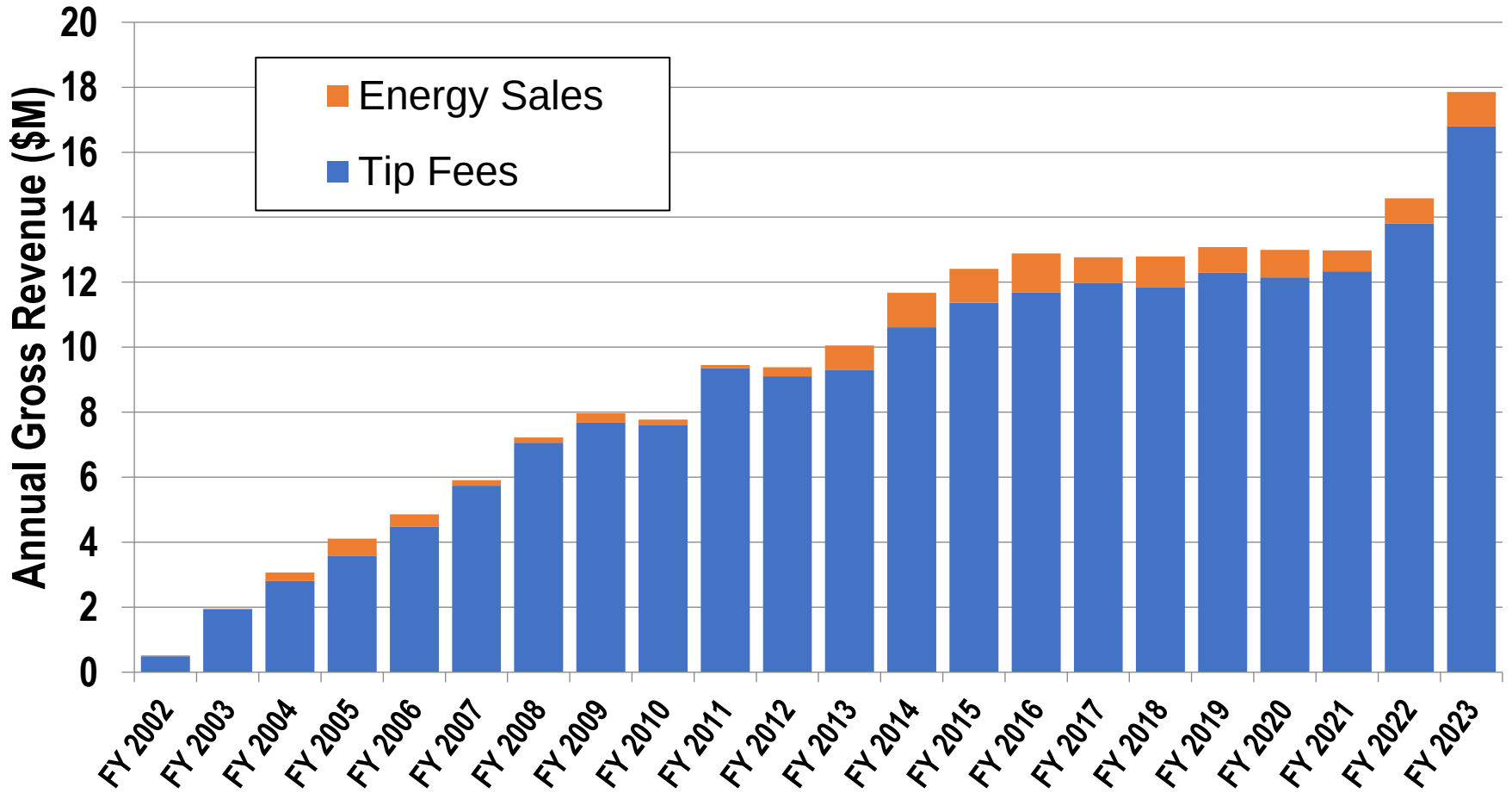
Renewable Energy Production

- Value of avoided energy purchases: $2.6 million
- Sales to the Port of Oakland: $1.06 million
- Agreement with Port through June 2025
- Next solicitation: Offer both hydropower and biogas electricity

Pardee Dam

Power Generation Station

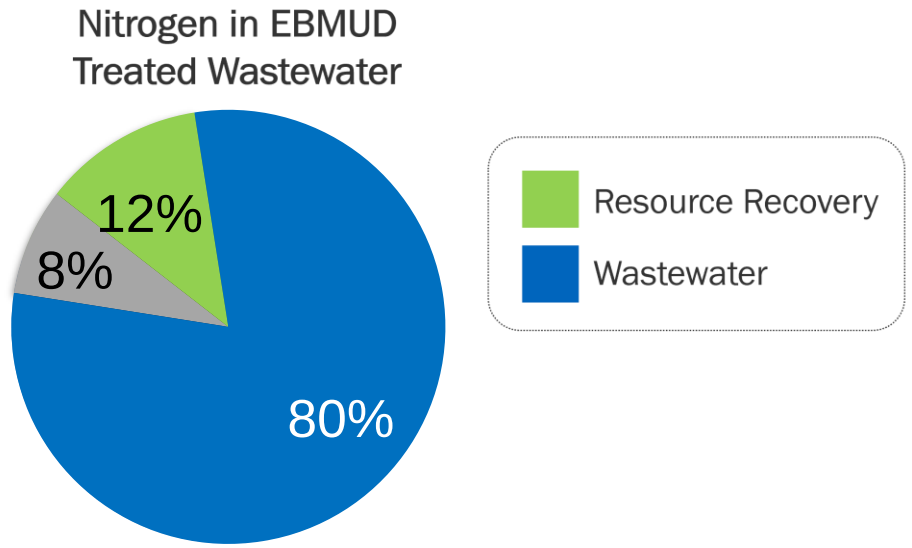
R2 Program Historical Gross Revenues

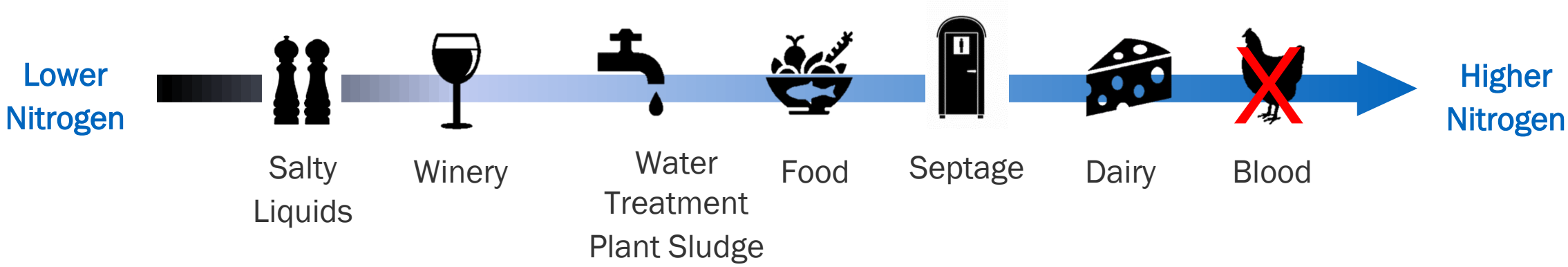


R2 Program and Nutrient Discharges

~ 20% of nitrogen in EBMUD's treated wastewater is from R2.

~ 8% of nitrogen eliminated when R2 stopped accepting blood





Food Waste Partnerships

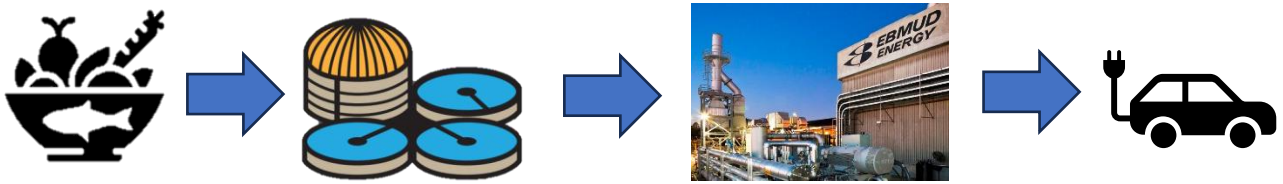
- Collaboration with Central Contra Costa Solid Waste Authority (RecycleSmart)
- Current agreement expires in 2025; a successor contract is being negotiated

Recycle Smart
Central Contra Costa Solid Waste Authority

Ground food waste at Martinez Transfer Station

Workplace Electric Vehicle Charging

- Employees pay to charge with onsite renewable energy
- Two chargers in operation
- User base expanded to 25
- Planning for expansion



waste biogas electricity vehicles

Cars charging at workplace electric vehicle charging station

Hydrogen Fuel Station Status

Building demolition, construction, and installation of hydrogen storage equipment

Next Steps

- Make improvements to infrastructure for converting waste to renewable energy
- Right size R2 to manage nutrient discharges
- Expand workplace electric vehicle charging access at Main Wastewater Treatment Plant
- Obtain the best value for surplus energy sales

Questions?