Southeast Resource Recovery Facility (SERRF)

City Council Study Session – April 5, 2022

LONG BEACH ENERGY RESOURCES

CITY OF LONG BEACH

Purpose

SERRF is a clean and responsible alternative to landfills when environmental and human health impacts are considered

- In Long Beach, we manage waste by:
  - First, encouraging waste reduction in an effort to reach zero-waste
  - Second, we encourage reuse, in further effort to reach zero-waste
  - Then, we recycle what cannot be reused and for which recycling is possible
  - Finally, for waste that cannot be recycled, we use it as a fuel source to create local clean energy that supports an increasing demand for electricity in our global quest to reduce reliance on fossil fuels – as opposed to landfill

Background

- Closure of the Palos Verdes landfill in 1980 led to a realization that the City of Long Beach (City) could no longer rely on the export of its municipal solid waste to other communities
- Long Beach developed the SERRF solution, incorporating Waste-To-Energy (WTE) technology, **as an environmentally responsible tool for waste management**
- The City and the Los Angeles County Sanitation Districts co-own SERRF under a Joint Powers Authority (JPA) with a 2/3 to 1/3 spilt between the City and the Sanitation Districts, respectively
- SERRF began commercial operations in July 1988 and is currently operated by Covanta Long Beach Renewable Energy (Covanta)

WTE vs Landfilling

- Multiple scientific studies have shown that WTE offers significant reductions in greenhouse gases (GHGs) compared to that of landfilling waste
- WTE is a critical tool to avoid landfilling waste after reduction, reuse and recycling
- WTE avoids the main consequences of landfilling – leaking of toxic chemicals into the ground and the release of methane
- Methane, emitted by landfills, is the second largest contributor to global climate change
- NASA scientists have identified landfills as super-emitters of methane
- Landfills don't measure their emissions, they model them and have been underreporting for years
- Methane is 80x more potent than CO_2 over 20 years as a GHG

Scientific Studies - WTE vs Landfilling

Berkeley Law (2016) Wasting Opportunities: How to Secure Environmental & Clean Energy Benefits from Municipal Solid Waste Energy Recovery

"Harvesting these leftover materials as solid waste energy sources could provide multiple environmental benefits: complementing intermittent renewable energy, such as wind and solar, to offset fossil fuel-based energy sources and associated greenhouse gas emissions; avoiding landfill emissions of methane (a potent greenhouse gas that is 28-34 times as strong as carbon dioxide over 100 years) by diverting wastes to energy, particularly organic wastes;"
https://www.law.berkeley.edu/research/clee/research/climate/waste-to-energy/

CARB

"[C]ombusting waste in the three MSW Thermal facilities in California results in net negative GHG emissions, ranging from -0.16 to -0.45 MT CO2e per ton of waste disposed, when considering that the waste would otherwise be deposited in landfills resulting in higher emissions." p.90: *https://www.arb.ca.gov/cc/scopingplan/2013_update/waste.pdf*

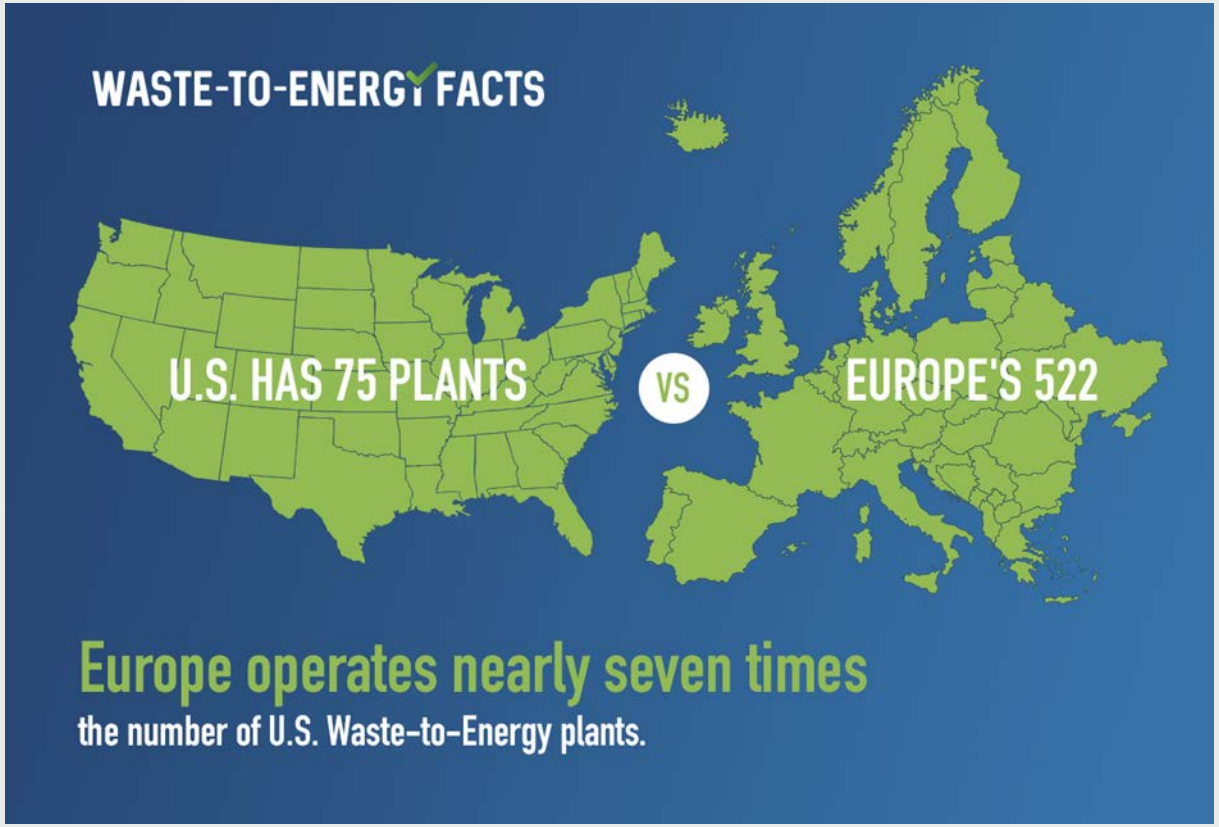
CalRecycle

"Published LCA studies and best available published direct measurement data support CalRecycle staff's general conclusions. CalRecycle staff concludes that the three existing California WTE facilities provide net avoided methane emissions over waste otherwise disposed in a California landfill. The net avoided emissions exceed non-biogenic emissions from burning of the fossil fuel based components such as plastic in the WTE facility."
http://dpw.lacounty.gov/epd/conversiontechnology/download/CalRecycle_Review_of_WtE_Avoided_Emissions_07032012.pdf

Scientific Studies - WTE vs Landfilling

- U.S. EPA scientists, in a prominent peer reviewed paper, concluded WTE facilities reduce GHG emissions relative to even those landfills equipped with energy recovery systems
- Many other governmental and nongovernmental organizations have formally recognized WTE for its role in reducing world-wide GHG emissions including the:
  - Intergovernmental Panel on Climate Change (IPCC) called WTE a “key GHG mitigation technology”
  - World Economic Forum (WEF) which identified WTE as one of eight renewable energy sources expected to make a significant contribution to a future low carbon energy system
  - European Union
  - Clean Development Mechanism of the Kyoto Protocol
  - Voluntary carbon markets
  - Third Way and the Center for American Progress

WTE vs Landfilling



- There are 75 waste-to-energy (WTE) facilities in the US that process nearly 94,000 tons of municipal solid waste per day, producing enough energy to power the equivalent of 2.3 million homes
- WTE operations continue to expand worldwide with new plants being built in Europe and Asia. More than 120 WTE facilities have been built around the world in the past five years
- The European Union mandates aggressive diversion of organics from landfills and currently exempts WTE from their cap & trade programs
- Landfilling is almost non-existent in countries such as Belgium, the Netherlands, Denmark, Sweden, Germany, Austria, and Finland. In these countries, WTE plays an important role alongside recycling. Germany and Austria are also the EU's top recycling countries

Asset To Our Climate

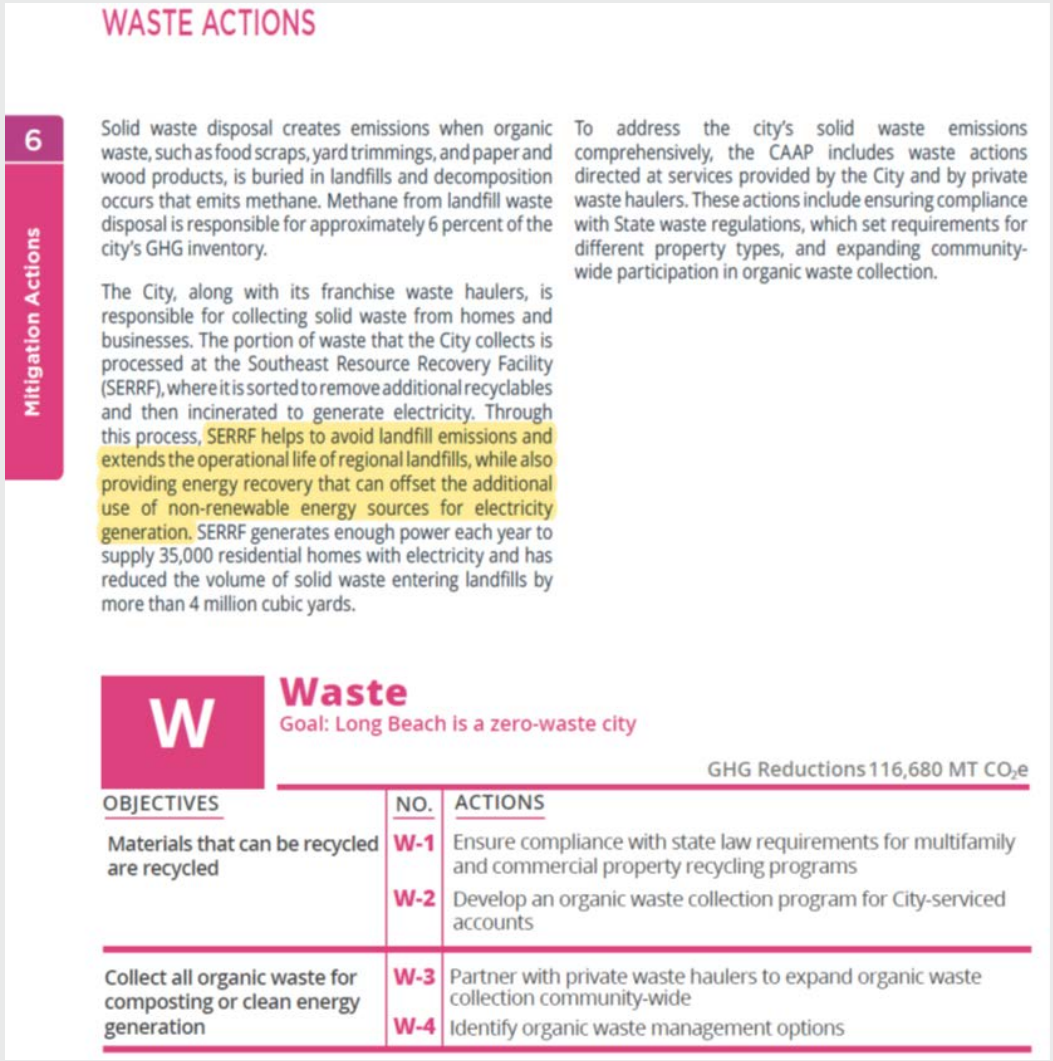
Climate Action

- California's Environmental Goals
- City Council Adopted Climate Action and Adaption Plan (CAAP)
- Recycling
- Air Pollution Control
- Clean Energy Production

California's Environmental Goals

- WTE operations reduce carbon dioxide (CO_2) emissions that otherwise will be generated from longer transportation distances to outside landfills that are currently 30 to 60 miles away
- WTE operations reduce the need for landfilling that leads to avoiding landfill emissions of methane (80x the warming power of CO_2 over the first 20 years after it reaches the atmosphere)
- Every ton of waste processed in a WTE facility avoids a ton of CO_2 equivalent emissions based on 100-year methane global warming potential

City's CAAP Goals



WASTE ACTIONS

6 Mitigation Actions

Solid waste disposal creates emissions when organic waste, such as food scraps, yard trimmings, and paper and wood products, is buried in landfills and decomposition occurs that emits methane. Methane from landfill waste disposal is responsible for approximately 6 percent of the city's GHG inventory.

The City, along with its franchise waste haulers, is responsible for collecting solid waste from homes and businesses. The portion of waste that the City collects is processed at the Southeast Resource Recovery Facility (SERRF), where it is sorted to remove additional recyclables and then incinerated to generate electricity. Through this process, SERRF helps to avoid landfill emissions and extends the operational life of regional landfills, while also providing energy recovery that can offset the additional use of non-renewable energy sources for electricity generation. SERRF generates enough power each year to supply 35,000 residential homes with electricity and has reduced the volume of solid waste entering landfills by more than 4 million cubic yards.

To address the city's solid waste emissions comprehensively, the CAAP includes waste actions directed at services provided by the City and by private waste haulers. These actions include ensuring compliance with State waste regulations, which set requirements for different property types, and expanding community-wide participation in organic waste collection.

W Waste

Goal: Long Beach is a zero-waste city

GHG Reductions 116,680 MT CO_2e

OBJECTIVES	NO.	ACTIONS
Materials that can be recycled are recycled	W-1	Ensure compliance with state law requirements for multifamily and commercial property recycling programs
	W-2	Develop an organic waste collection program for City-serviced accounts
Collect all organic waste for composting or clean energy generation	W-3	Partner with private waste haulers to expand organic waste collection community-wide
	W-4	Identify organic waste management options

- The City's Climate Action and Adaptation Plan (CAAP) incorporates the continued use of SERRF into the future
- GHG's would increase approximately 98,200 MT CO_2e/yr (4% increase) from methane emissions associated with landfilling the City's waste vs SERRF
- Trucking the City's waste to a landfill, instead of using SERRF, adds additional GHG impacts
  - Estimated 761,500 additional miles driven annually which equates to a 2,690 MT CO_2e /yr increase
- Additional reductions from other sector(s) would be required to keep the City's CAAP in balance
- Other jurisdictions that currently bring waste to SERRF would see similar increases to their respective CAAP's and would need similar other sector(s) reductions

Recycling

- U.S. communities with WTE operations have a higher recycling rate than the national average— with some reaching over 50 percent recycling. The City currently exceeds a 50 percent recycling rate
- In the US, WTE operations recovers more than 700,000 tons of metal each year for recycling – the equivalent amount of steel to build more than seven Golden Gate Bridges
- Each month, an average 750 tons of metal are recycled at SERRF rather than sent to a landfill
- Only so much of our waste stream is practically recyclable. Items like disposable diapers, hybrid materials (paper glued to plastic), medical waste, cannot be recycled

Recycling

- WTE operations provide the safe disposal of unused and expired prescription medications preventing drugs from ending up in the wrong hands or polluting public water supplies
- Recycling benefits SERRF by diverting non-combustible materials from SERRF that have minimal fuel value or can cause operational problems

Air Pollution Control

- SERRF is equipped with the Best Available Control Technology (BACT) which removes 99% of HCI and 95% of SO_2 acid gasses as well as 99.5% of the particulate matter from the gas exhausted
- SERRF has been required to upgrade its pollution control technology over the years as regulations have become more restrictive and new pollution control equipment has been developed

Clean Energy Production

- WTE offers a clean source of low-to-zero carbon baseload energy produced through transformation of municipal solid waste within the U.S. EPA Clean Power Plan or World Economic Forum standards
- WTE has been recognized as renewable in federal law and is defined as renewable in 30 US states (not California) and the European Union

Asset To Our Community

Local Impacts

- Provides local, good paying jobs
  - o Covanta currently employs 60 people at SERRF, 44 of which are IBEW represented personnel
- Supports the local economy through buying goods and services from local businesses
- Reduces transportation and disposal cost of City collected municipal solid waste

About the Facility

Southeast Resource Recovery Facility (SERRF)

- Location
- Operations
- WTE Process
- Energy Production
- Ash Handling
- Performance
- Financials

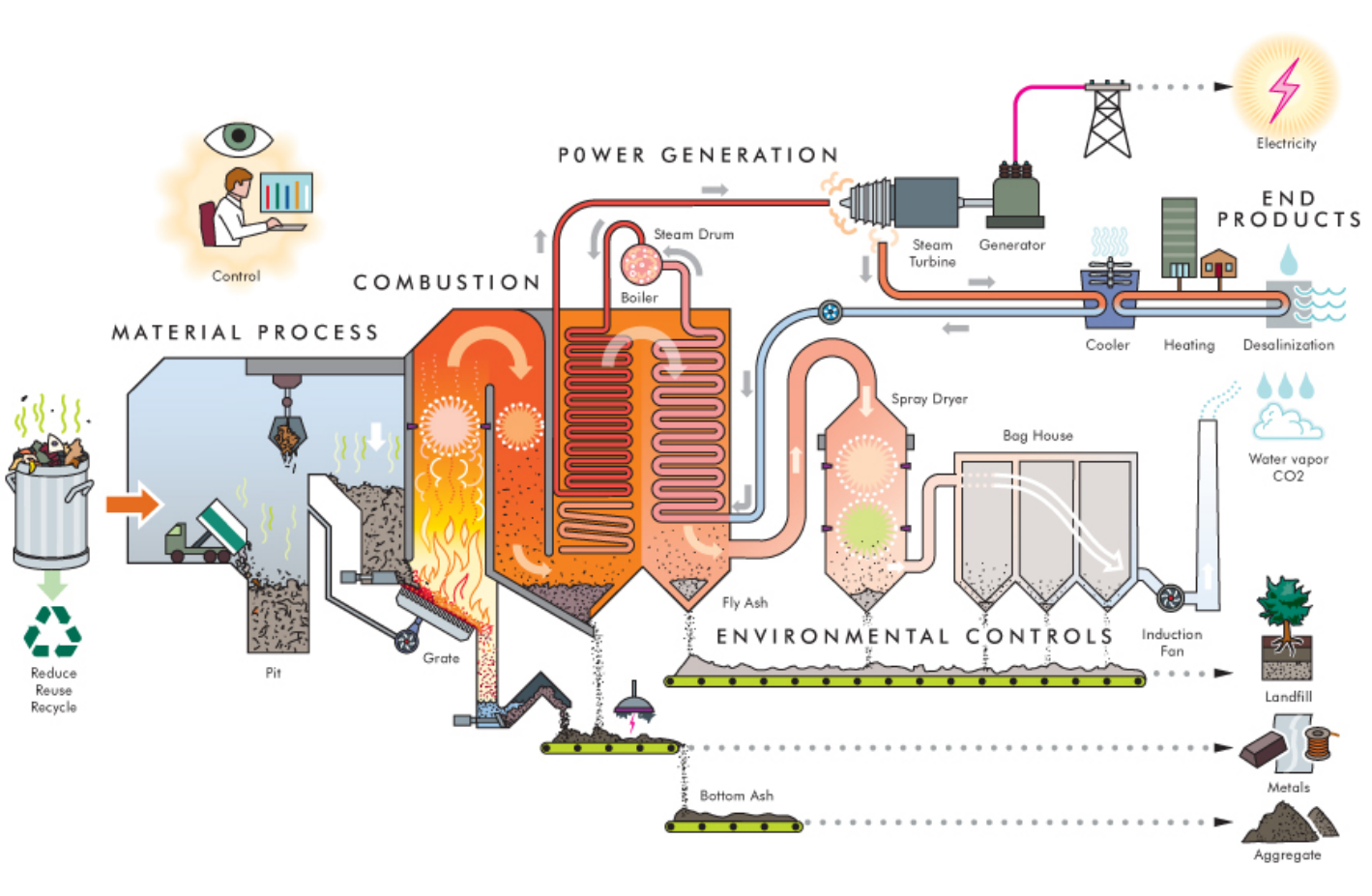
SERRF - Location

Nearest resident is approximately 1.7 miles away

SERRF - Operations

- COST: $108,000,000 (1988)
- CAPACITY: 1,380 tons/day of solid waste
- SERRF is a solid waste management facility that uses mass burn technology to reduce the volume of solid waste by about 80% while recovering electrical energy and metal
- Source reduction and recycling reduce the amount of waste managed and reduce consumption of natural resources and the environmental damage associated with such use

SERRF - WTE Process

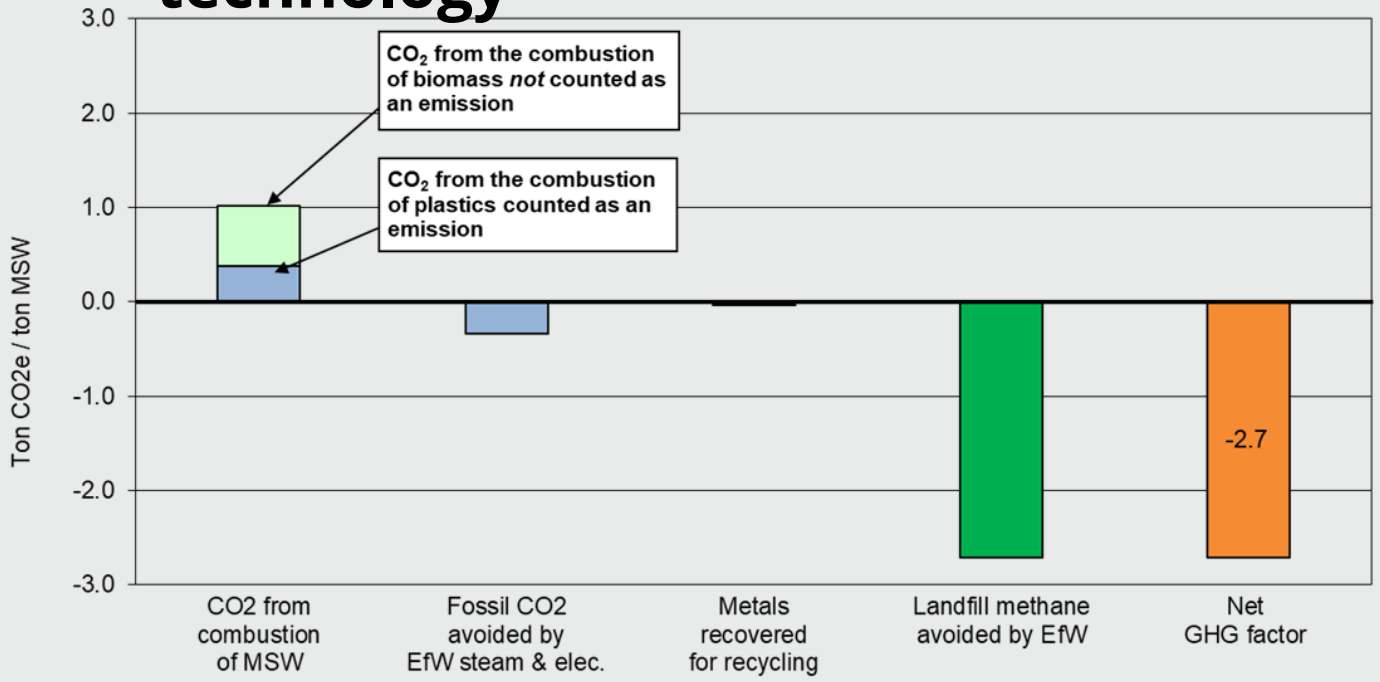


WTE differs from combustors that are classified as incinerators because of the energy recovery component. The process of generating electricity in a WTE facility has seven (7) stages:

1. Solid waste is dumped from refuse trucks into a large pit/floor
2. A claw on a crane grabs waste and loads it in a combustion chamber
3. The waste (fuel) is burned, releasing heat
4. The heat turns water into steam in a boiler
5. The high-pressure steam turns the blades of a turbine generator to produce electricity
6. An air pollution control system removes pollutants from the combustion gas before it is released through a stack
7. Ash is collected from the boiler and the air pollution control system. It is then treated with the Wes Phix treatment process to ensure the ash is **nonhazardous** under California and Federal regulations

SERRF – GHG's Avoided (LCA using 20-year GWP of methane)

WTE is a GHG mitigating technology



WTE facilities in the U.S. reduce lifecycle emissions by an average of 1 ton of CO2e per ton of MSW diverted from landfills. This GHG mitigation factor can be refined for a particular facility using the 20-year GWP of methane (instead of the 100-year GWP), the facility specific operating data (2019-2021), and local grid intensity. GHG equivalencies calculated with the US EPA's Greenhouse Gas Equivalencies Calculator.

Historic GHG's Avoided

- Since beginning operations in 1988, SERRF has avoided over 37 million tons of CO_2e
- This is equivalent to closing 9 coal power plants for a year

Future GHG's Avoided

- In the next 20 years, SERRF is expected to avoid another 19 million tons of CO_2e.
- This equivalent to removing 3.7 million passenger vehicles from the road for a year

SERRF - Energy Production

- On average, SERRF produces 212,000 megawatt hours of electricity per year
- This represents 28% of the annual residential electric load for the City or enough to power 63,600 electric vehicles per year
- SERRF Generated $9.1 million in electricity sales in Fiscal Year (FY) 21

SERRF – Ash Handling

- SERRF generates an ash residue composed of the noncombustible material in wastes and materials added for air pollution control, such as activated carbon and lime
- SERRF's combined ash is tested routinely to confirm that it is **nonhazardous** per U.S. EPA and California regulations. To comply with those regulations, the ash is regularly tested for toxicity including through the toxicity characteristic leaching procedure (TCLP)
- SERRF's ash **has never** been determined to be a hazardous waste
- Materials derived from ash can be used as secondary raw material, replacing gravel and sand in construction projects

SERRF – Ash Handling

- SERRF's **nonhazardous** ash is currently being trucked to the El Sobrante landfill in Riverside County (57 Miles)
- The **nonhazardous** ash then is used as a road base material at the landfill site
- SERRF averages 14 truckloads/day, Monday – Saturday, for ash hauling

SERRF – Performance (FY21)

- SERRF processed its 15 millionth ton of refuse and sold its 7 millionth megawatt of electricity
- SERRF has reduced the volume of waste entering landfills equal to an area the size of a football field piled 2.5 miles (13,200 ft) high
- Processed 385,000 tons of refuse and recycled 9,110 tons of metals that otherwise would have gone to landfills
- Destroyed 17,000 pounds of law enforcement confiscated narcotics each month
- Completed over $11.3 million in facility equipment upgrades

Financials

SERRF Pro Forma

		FY22 ETC	FY23 Budget	FY24 Budget (Thru June)
	Refuse Received (Tons)	400,000	410,000	307,500
	Electricity Generated (GW)	200,000	199,670	149,753
	Opening SERRF Fund Balance	**$ 15,335,380**	**$ 11,833,380**	**$ 9,941,380**
Revenues				
	Electric Sales	$ 9,574,000	$ 9,450,000	$ 7,090,000
	SERRF Refuse Fees	$ 31,870,000	$ 34,990,000	$ 26,240,000
	Pooled Cash Interest	$ 92,000	$ 118,000	$ 99,000
	SUBTOTAL	**$ 41,536,000**	**$ 44,558,000**	**$ 33,429,000**
Expenses				
	Facility			
	O & M	$ 29,166,000	$ 32,850,000	$ 24,640,000
	Ash Hauling & Disposal	$ 7,035,000	$ 7,920,000	$ 6,420,000
	Capital Improvement	$ 750,000	$ 750,000	$ -
	One Time Expenses	$ 1,742,000	$ -	$ -
	Regulatory	$ 2,613,000	$ 2,810,000	$ 2,400,000
	Insurance	$ 1,644,000	$ 1,800,000	$ 1,364,000
	SUBTOTAL	**$ 42,950,000**	**$ 46,130,000**	**$ 34,824,000**
	COLB			
	Personnel	$ 520,000	$ 541,000	$ 405,000
	Non-Personnel	$ 659,000	$ 408,000	$ 318,000
	Internal Services	$ 159,000	$ 160,000	$ 125,000
	Depreciation	$ 750,000	$ 750,000	$ 750,000
	SUBTOTAL	**$ 2,088,000**	**$ 1,859,000**	**$ 1,598,000**
ADJUSTMENTS				
	SERRF Land Sale		**$ 1,539,000**	
	ENDING FUND BALANCE	**$ 11,833,380**	**$ 9,941,380**	**$ 6,948,380**

- SERRF is projected to remain solvent under its current operating contract with Covanta with enough Budgetary Funds Available to sustain operations through June 2024.
- SERRF is an enterprise fund and receives no General Fund dollars for its operations
- If a long-term operations contract is awarded, SERRF can obtain more lucrative electrical sales contracts
- Needed equipment repair /replacement will increase boiler performance allowing for additional electric and refuse revenues

Environment

Considerations to

- Health
- Emissions
- Vehicle Traffic

Health

- SERRF is located in an industrial area and Health Risk Assessments required by the SCAQMD, using SCAQMD protocols, have shown no health risks to its local residents
- A 2007 National Research Council report states the epidemiological studies suggest there is no association between human health effects and the operation of WTE facilities
- Multiple air quality health risk assessments and health surveillance programs surrounding WTE facilities in the US and globally have determined that there was ***not a predictive or actual increase in health issues***, including for those in vulnerable or sensitive at-risk populations such as children or the elderly

Health

Japanese WTE facility, completed in 1991, integrated into the local community. Public health is a primary driver in their land use considerations.

Emissions

- SERRF has been successfully operating for nearly 34 years in the most regulated air basin in the United States
- SERRF's emissions are monitored continuously and must comply the rules, regulations, and permits issued by the SCAQMD and EPA. These regulations are continually being upgraded and changed as new technology is developed
- SERRF's emissions are measured both through routine stack tests (performed at least once a year) and through continuous emissions monitors (CEMS)

Emissions

- CEMS monitor SERRF's emissions continuously for carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO2), opacity, and carbon dioxide and/or oxygen. SERRF operators monitor these parameters real-time and adjust as needed to ensure proper operation and compliance
- Other regulated pollutants are checked through a rigorous stack testing program performed by a regulator-approved third-party
- Over the last two years, SERRF's emission were out of compliance 0.06% of its operating time due to equipment malfunction(s), which are allowed under SCAQMD regulations

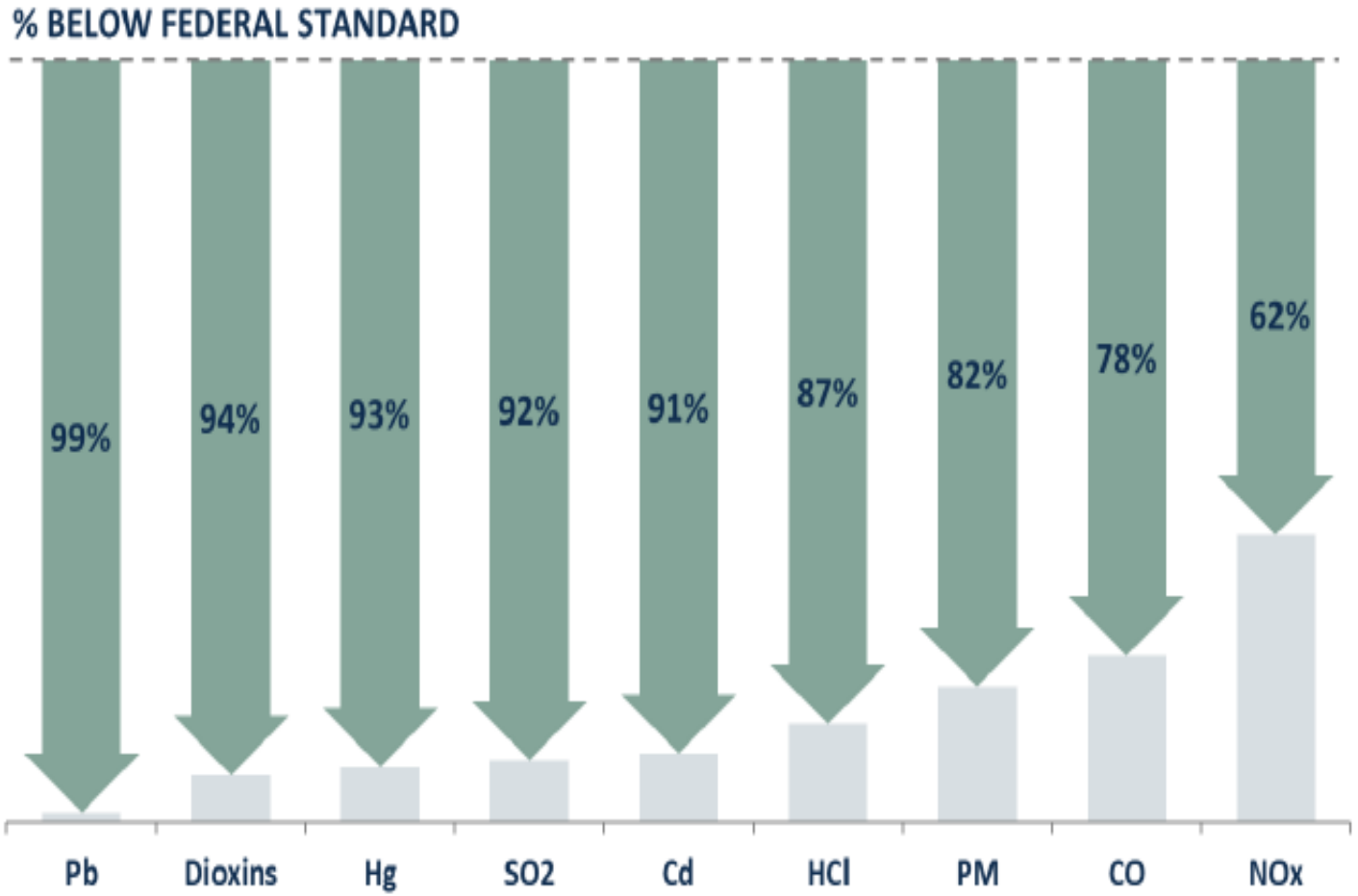
Emissions

2019-2021 WTE Emissions Compared to Federal Standards

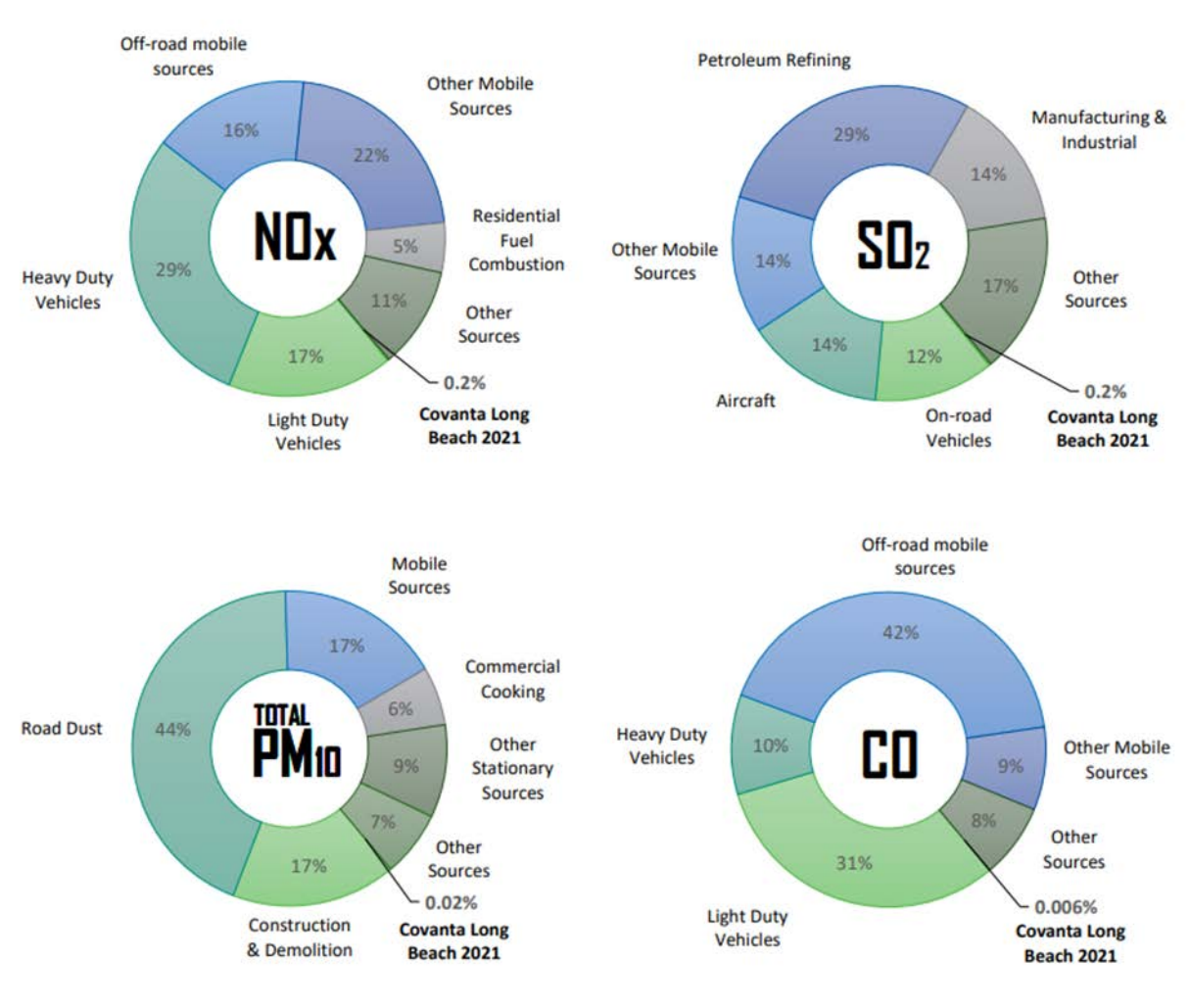
The facility operates up to **99% below** federal emissions standards

Emissions compared to federal guidelines for existing facilities (40 CFR 60 Subpart Cb).

Facility may be subject to more stringent requirements by permit or in accordance with other federal guidelines.



Emissions



SERRF is a very small contributor to overall emissions in the South Coast Air Basin Counties*

- The facility emits 0.2% (or less) of the Air Basin's NOx, SO2, PM10, and CO emissions
- Mobile sources are, by far, the largest contributor to air emissions, representing 84% of NOx, 41% of SO2 emissions, and 92% of CO
- For all of 2021, SERRF emitted 0.003 lb of dioxins, comparable to the approximate dioxin emissions of a 150-acre forest fire. In 2021 alone, nearly 2.6 million acres burned in CA.
- An inventory of dioxin emission sources in the U.S. quantitatively showed that the emissions contribution from all WTE facilities (i.e., compared to controlled industrial dioxin emissions) is 0.54%

* Based on the CARB Criteria Pollutant Emission Inventory Data for the 2017 base year. Where available, the facility's 2017 emissions were replaced with the reported 2021 emissions.

Emissions

What comes out of the stack?

NOx

0.007%

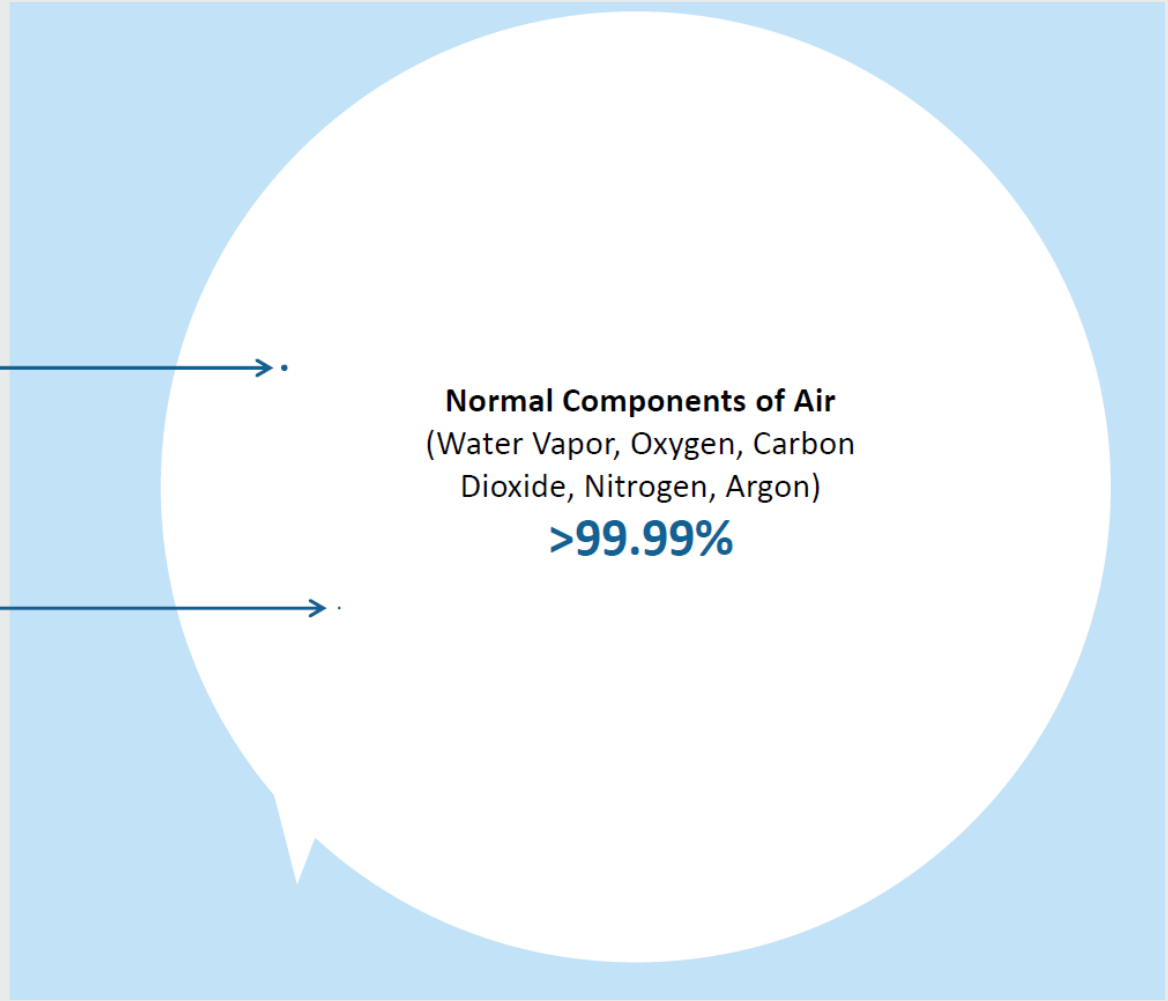
Other Emissions

(CO, SO_2, HCl, NH_3, N_2O, PM, metals, PCDD/F, VOC, CH_4, HF)

0.004%

How small is 0.004 percent?

3.5 seconds out of a day
21 minutes from a year
4 strands from a full head of hair



Vehicle Traffic

- Refuse trucks can only enter SERRF between the hours of 6:00 AM - 6:00 PM, Monday thru Saturday
- Average of 165 trucks use SERRF daily and 50% of those are CNG powered. All City refuse trucks are CNG or LNG powered (34% less emissions vs diesel over the total life cycle)
- Ash hauling averages 14 truckloads/day, none drive through any Long Beach/Los Angeles residential areas
- For the 2020 calendar year, trucks utilized for SERRF's operations accounted for 0.53% of the vehicles in the combined Port of Long Beach and Port of Los Angeles traffic area*

	Container Terminal Truck Calls	Non-Container Terminal Truck Calls	SERRF Trucks	Total Trucks
POLB	**3,685,465**	**317,139**	**44,937**	**4,047,541**
POLA	**3,903,349**	**585,120**		**4,488,469**
Totals	**7,588,814**	**902,259**	**44,937**	**8,491,073**

* Does not include passenger cars, or other non-port activity vehicles

The Future

Considerations

- Current Challenges
- Proposed AB 1857 Legislation
- SERRF's Future
- Next Steps

Current Challenges

- SERRF has been operating for nearly 34 years and is at a pivotal moment where in order to ensure operation for the next 30-years, significant capital investment is required
- HDR Engineering, Inc's (HDR) condition assessment study completed in 2018 indicated $12.9 million capital investment needed to continue operations through 2024 (completed in FY 21) and up to $66.3 million additional capital investment to continue long term operation through 2039
- Current operations agreement with Covanta ends on June 30, 2024
- Current SERRF Fund pro forma projections indicate the facility solvent through at least June 2024, however operational sustainability is at risk if projected facility performance, electrical revenues, and anticipated tip fees are not realized

Current Challenges

- The regional waste market is facing upward pressure in landfill prices and uncertainty in long-term landfill availability (further impacted by the closing of the Puente Hills landfill in 2013)
- Orange County landfills are rumored to be shut off to LA county trash at the beginning of 2025
- If SERRF's operations were to cease, the City would have no option but to ship its municipal solid waste greater distances resulting in a significant increase to the City's disposal costs and GHG emissions
- The City and the State of California have significant organics diversion goals without the infrastructure to meet them

Proposed AB 1857 Legislation

- The February 8, 2022 proposed AB 1857 legislation removes the current waste diversion credit for jurisdictions that deliver their municipal solid waste to existing WTE facilities in California
- The diversion credit was created as part of AB 939 (the Recycling Law) that was passed in 1989
- The AB 939 diversion credit was crafted by CalRecycle to not financially penalize WTE facilities that took action to implement an accepted solid waste management strategy and furthered recycling goals
- CalRecycle also recognized the benefits of WTE versus landfilling and desired to encourage the continued use of SERRF

Proposed AB 1857 Legislation

- How does the AB 939 diversion credit work?
  - A jurisdiction can deliver up to 10% of its annual municipal solid waste generation to a WTE facility and receive recycling credit for that waste

    Example *– If a jurisdiction generates 100,000 tons/yr of waste, that jurisdiction can send 10,000 tons to a WTE facility and receive 100% recycling credit for that waste. The credit is capped at 10%. If a jurisdiction delivers above 10% of their annual generation, they do not receive any recycling credit for the amount over the 10% cap*

- 148 different local jurisdictions currently bring their municipal solid waste to SERRF for the AB 939 diversion credit, and they account for approximately 50% of the waste tonnage processed annually at SERRF

Proposed AB 1857 Legislation

- The proposed AB 1857 does nothing to reduce landfilling or increase recycling or organics diversion. In fact, it will increase landfill disposal
- The proposed AB 1857 is based on inaccurate data and misrepresentations of WTE operations
- The proposed AB 1857 pushes a Zero Waste Plan that is an excellent aspirational goal, but a challenging and sometimes impossible one given current manufacturing and industrial processes
- LA County Solid Waste Management Committee/Integrated Waste Management Task Force is opposing AB 1857 unless it is amended

Proposed AB 1857 Legislation

- Rural County Representatives of California (RCRC) also opposes AB 1857. RCRC is an association of 39 rural California counties and the RCRC Board of Directors is comprised of elected supervisors from each of those member counties
- AB 1857 passed out of Natural Resources Committee on March 22nd and is now sitting in the Appropriations Committee. Likely will not move until sometime mid-May and then would be considered by the whole Assembly.
- Staff recommends opposing the proposed AB 1857 legislation due to the detrimental impacts to:
  - GHG emissions
  - SERRF's current and future operations
  - Additional trucks traveling through communities previously not impacted
  - Offering no practical solution besides additional landfilling

SERRF's Future

- City Staff is now engaged in a formal study with HDR regarding assessing the future opportunities for SERRF
- HDR Study
  - Scope is to develop project concepts and procure a potential new developer/operator for SERRF
  - 2-year contract with 3 potential one-year extensions
  - $250,000 study ($500,000 contract value)
  - Study goals are to identify technically environmental and economically viable options for the future of SERRF including organic waste processing in compliance with AB 1383

SERRF's Future

- Potential HDR Study Outcomes
  - New long-term (20 years+) contract for SERRF including the development of an organic waste facility at SERRF
  - New short to medium-term (5–10 years) operations contract for SERRF including the development of an organic waste facility at SERRF
  - No viable proposals are received and other options need to be explored
- Desired Outcome
  - Advanced technology at SERRF that improves operations and environmental controls
  - New organic waste facility at SERRF in compliance with AB 1383
  - Significant improvements in waste reduction, recycling, reduced SERRF throughput, and no landfilling

SERRF's Future

- City Staff and HDR have held a kick-off meeting and have met with potential organics and WTE developers and operators
- HDR is currently outlining options for organics processing and the future of SERRF which are expected to be key elements in the development of an RFP
- The current schedule contemplates issuing an RFP to prospective WTE and organics operators/waste management technology companies in the July-September 2022 timeframe
- Council input anticipated:
  - Prior to RFP issuance (late April/May 2022)
  - After proposals are reviewed and ranked (December 2022/January 2023)
  - Consideration of new contract (1st or 2nd quarter 2023)

Next Steps

- Until a different alternative to landfilling is available for residual waste, staff recommends continuing current SERRF operations and seeking solutions for the future of SERRF
- Staff recommends opposing the proposed AB 1857 legislation due to the detrimental impacts to:
  - GHG emissions
  - SERRF's current and future operations
  - Additional trucks traveling through communities previously not impacted
  - Offering no practical solution besides additional landfilling
- Continue to research additional organic options and exploring the future of municipal solid waste

Thank you