
Public Works Commission
March 10, 2022
Legislation

Regulations

Landfill tax
The waste framework directive
The waste incineration directive
Control measures for biological treatment
Standardisation of solid recovered fuels
Landfill ban on organic waste
The landfill directive
Landfilling by dispensation

WASTE SYSTEM

WASTE INCINERATION

ENERGY SYSTEM

Green certificates
Waste incineration tax
Change in energy and environmental taxes
Combined heat and power taxation
Green tax reform
Waste-to-Energy Incineration

How Much More Efficient Is the System?

<table>
<thead>
<tr>
<th>Waste-to-Energy</th>
<th>Coal &amp; Oil-Fired</th>
<th>Gas-Fired</th>
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</thead>
<tbody>
<tr>
<td>~90%</td>
<td>37%</td>
<td>56-60%</td>
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SYSAV's waste-to-energy plant in Malmö, Sweden
Common heating plant supplies hot water to 50% of all commercial/residential buildings.
Introduction

European Union
Waste Hierarchy
Recycling

Waste Management
Extended Producer Responsibility

[Diagram showing a cycle with steps: Product Design, Material Sourcing, Recycling, Product Collection, Product Use, Production, with the central message: Producer Responsibility]
<1% Waste to Landfills
Trash Converted to Energy

Trash converted into energy =
Heating to 1,000,000
Electricity to 250,000

Carbon dioxide emissions have been reduced by 2.2 million tonnes/year

47% 1%

52%
Less Emissions – More Energy

Incineration, Energy Production and Dioxin into the Air from Waste Incineration 1985-2006

Energy production, MWh
Incineration, tons
Dioxin (into the air), grams
Covanta Stanislaus

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

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>% Below Federal Standard</th>
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<tbody>
<tr>
<td>Pb</td>
<td>99%</td>
</tr>
<tr>
<td>Hg</td>
<td>98%</td>
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<tr>
<td>Dioxins</td>
<td>94%</td>
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<tr>
<td>Cd</td>
<td>88%</td>
</tr>
<tr>
<td>PM</td>
<td>86%</td>
</tr>
<tr>
<td>SO2</td>
<td>85%</td>
</tr>
<tr>
<td>CO</td>
<td>85%</td>
</tr>
<tr>
<td>HCl</td>
<td>78%</td>
</tr>
<tr>
<td>NOx</td>
<td>49%</td>
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Southeast Resource Recovery Facility (SERRF)

- Produces electricity to furnish more than 35,000 homes with electrical power
- Processes an average of 1,290 tons of municipal solid waste each day
- Recycles an average 825 tons of ferrous metals each month
- Pollution control system removes:
  - 95% of sulfur dioxide and hydrochloric acid
  - 99.5% of particulate matter from the gas exhausted
Opportunities in California

Municipal solid waste discarded to landfills
1995 to 2019
Opportunities in California

Municipal solid waste by material – 2018

- Organic: 34%
- Paper: 17%
- Inerts and Others: 14%
- Plastic: 12%
- Other Materials: 10%
- Special Waste: 7%
- Metal: 5%
- Glass Electronic: 2%
- Household Hazardous Waste (HHW): 0%

CalRecycle
If enacted, proposed legislation will:

• Remove diversion credit for municipal solid waste incinerators
• Redefine practice of incineration as disposal
• Require CalRecycle to ensure that municipalities prioritize zero-waste strategies before constructing new incinerators
• Investment in zero-waste strategies, especially in frontline communities most impacted by incinerators
Municipal Waste 2020

Total volume municipal waste: 4,839,000 tonnes
- 76,000 tonnes Food and garden waste
- 940,000 tonnes Packaging
- 505,000 tonnes Materials from recycling centers
- 168,000 tonnes Recyclable paper
- 167,000 tonnes WEEE and batteries
- 2,283,000 tonnes Residual waste and bulky waste, incl. waste sent to landfill

1,246,000 tonnes raw material
- 409,000 tonnes loss to energy recovery
- 800 GWh electricity
  Waste incineration supplies a total of 780,000 households with electricity and 1.4 million households with district heating.

220 GWh vehicle gas
- 10 GWh heating + electricity
- Fuel (biogas) for 20,000 biogas vehicles that drive 15,000 km/year.

401,000 tonnes digestate
- 336,000 tonnes compost soil

ANAEROBIC DIGESTION → COMPOSTING

MATERIAL RECYCLING

ENERGY RECOVERY

LANDFILL

6,100 GWh heating
- 1,000 GWh is the energy required to power all of Sweden’s trains, metros and trams for five months.

1 GWh is the energy required to cover the electricity requirements of a city the size of Lund (about 100,000 inhabitants) for eight hours.

Landfill
- 1.2 GWh heating
- 0.05 GWh electricity

Relates to benefits from the treatment of municipal waste