Better Plants
U.S. DEPARTMENT OF ENERGY

Waste Diversion and Reduction 101

Virtual In-Plant Training

Session 1

Tuesday – February 18, 2025

10:00 am – 12:30 pm EST

U.S. DEPARTMENT OF ENERGY

Welcome

Welcome to the virtual INPLT waste training sessions!

- These sessions will consist of eight, two-and-a-half-hour webinars, focused on waste diversion and minimization
- The webinars will provide insights and best practices for managing waste, identifying opportunities for minimizing waste generation, creating strategies for waste diversion, developing methods to measure and quantify waste impacts, and more!
- A reminder that these trainings will be interactive! Each session will have polls and questions throughout, along with a summary quiz at the end and homework to complete prior to the next session

Thank you for your interest!

DOE's Waste Reduction Network:

- Open to all existing Better Plants partners
- Goals are flexible
- Six goal options based on partner feedback
- Quarterly webinars
- Bi-monthly newsletter
- Access to new waste-related tools, trainings, and programmatic elements

Waste Virtual INPLT Agenda

- **Week 1 (February 18th) – Introduction: Waste Diversion and Reduction 101**
- **Week 2 (February 25th) – How to Effectively Track and Measure Your Waste**
- **Week 3 (March 4th) – Source Reduction and Waste Minimization Techniques**
- **Week 4 (March 11th) – Finding Outlets for Hard to Manage Waste Streams**
- **Week 5 (March 18th) – Construction Waste Management and Green Building Certifications**
- **Week 6 (March 25th) – Scope 3 Emission Considerations**
- **Week 7 (April 1st) – Implementation of a Waste Diversion Program – Developing a Roadmap to Zero Waste**
- **Week 8 (April 8th) – Conclusions, Summaries, and Wrap up Presentations**

Plan of Action

Today, we will:

- Present an overview of Sustainable Solutions Corporation
- Lecture on today's topic, "Waste Diversion and Reduction 101"
- Conduct a Q&A session
- Test your knowledge with a Kahoot! quiz

Takeaways

Today, you will learn:

- Common terms and acronyms related to sustainability and waste management
- Overview of waste hierarchy
- Common waste streams generated by industry
- Legislation related to waste mitigation and diversion

Background on Sustainable Solutions Corporation

SustainableSolutions
CORPORATION

U.S. DEPARTMENT OF
ENERGY

Presenters from Sustainable Solutions Corporation

Tad Radzinski, PE, SEP, LEED AP, SFP

- Co-founder and President of Sustainable Solutions Corporation
- Formerly the EPA's Waste Minimization National Expert
- Over 35 years of experience in sustainability
- Adjunct professor at Villanova University

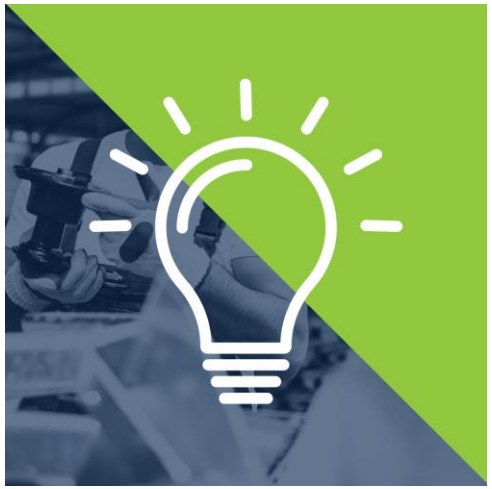
Nick Mummau, LEED Green Associate

- Senior Project Manager at Sustainable Solutions Corporation
- Leader of waste diversion and minimization projects for clients in industries such as consumer products, steel manufacturing, food manufacturing, textiles, and more

About Sustainable Solutions Corporation, Established in 2001

Operations

Products

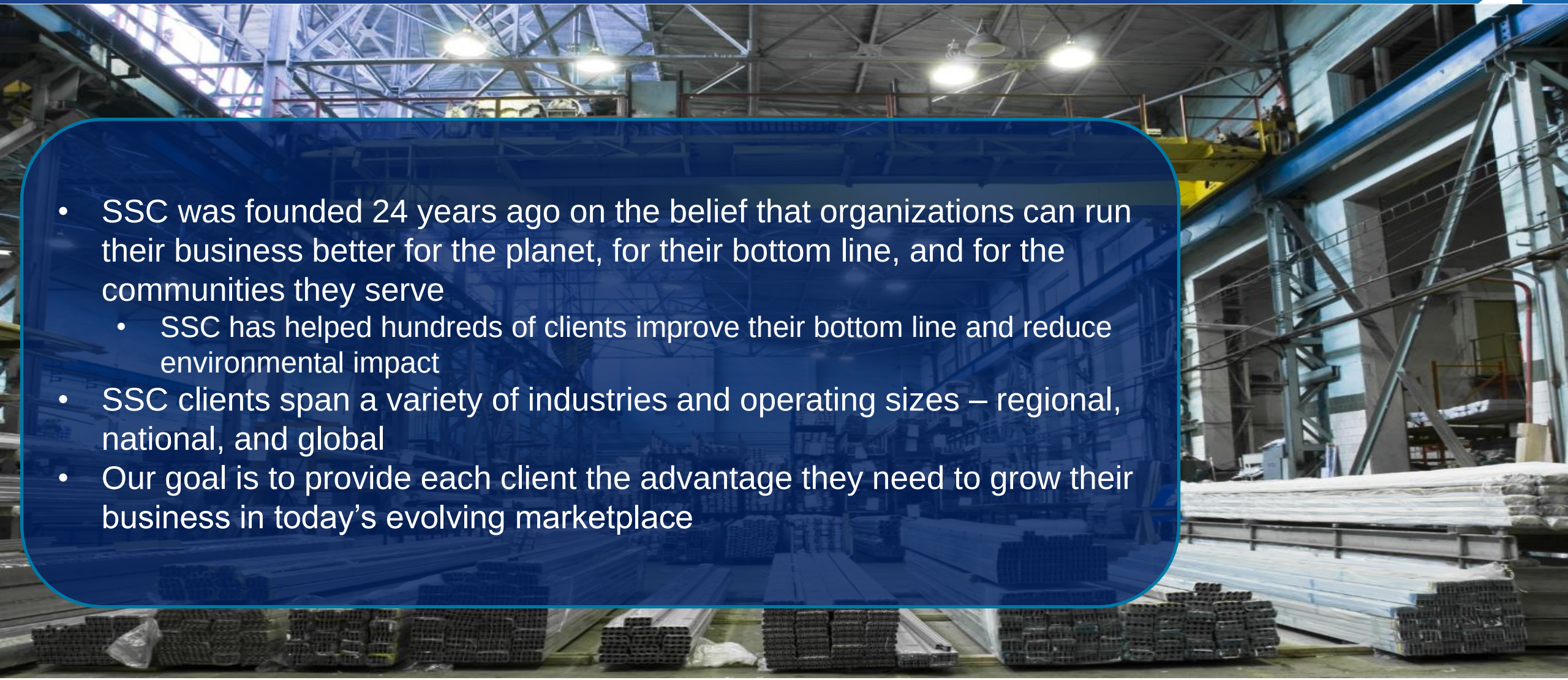


Corporate Strategy & Supply Chain

Training & Education

“SUSTAINABILITY DRIVES PROFITABILITY”

SSC Experience in the Manufacturing Sector



- SSC was founded 24 years ago on the belief that organizations can run their business better for the planet, for their bottom line, and for the communities they serve
  - SSC has helped hundreds of clients improve their bottom line and reduce environmental impact
- SSC clients span a variety of industries and operating sizes – regional, national, and global
- Our goal is to provide each client the advantage they need to grow their business in today's evolving marketplace

SSC Experience in the Manufacturing Sector

Case Study: Consumer Products Waste Minimization and Diversion Program

Facility

- Manufacturer of many household consumer products for beauty, oral care, and over the counter drugs
- Thousands of employees at over 20 sites around the world

SSC Services

- Data collection and benchmarking of site data
- Site visit to several sites all over the world
  - Waste assessment and waste characterization
  - Opportunity identification and quantification
- Interviews of all sites without site visits
- Development of company-wide waste playbook with opportunities for waste minimization and diversion for various business groups
- Development of waste standard, focused on making data collection consistent across sites utilizing waste coding

Results

- Identification of millions of dollars in potential material and waste savings through a plethora of opportunities:
  - Product design considerations
  - Adjustments in quality allowable limits
  - Machine design
  - Outlet identification
  - Enhanced data tracking and internal communication
  - Procurement supplier communication

Third-Party Verification

- Exploration of the key players in waste-related certifications
- Several sites are third-party certified by GreenCircle Certified or TRUE
- Guidance on different ways third-party certification could apply
  - Marketing of products made at zero-waste facilities
  - Verification of data to market achievements in sustainability reports

Poll: What value are you hoping to gain most from these trainings?

Please respond to the Zoom poll

Question: What are some hurdles or setbacks to current waste minimization or diversion efforts at your company?

Please type your answers in the chat

Today's Topic:

Waste Diversion and Reduction 101

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Common Sustainability Terms

- ***Sustainability:*** meeting the requirements of the present without compromising the needs of the future
- ***Carbon Emissions****:* a term which is commonly used in place of greenhouse gas (GHG) emissions
  - Note this is typically measured in CO_2eq – representing all GHG emissions in one equivalency value
- ***Greenhouse Gases:*** gases which trap heat in the atmosphere including carbon dioxide, methane, and more
- ***Triple Bottom Line:*** a framework of sustainable development including considerations for people; planet; and profit which helps increase economic efficiency while valuing environmental stewardship and social equity

Key Waste Terms

- ***Contamination:*** When multiple waste streams are commingled inappropriately
- ***Material Management Organization (MMO):*** Any organization that hauls, processes, treats, or otherwise manages outgoing material (other than finished product) from the facility
- ***Material Recovery Facility (MRF):*** Facility which sorts and prepares single stream recycling to sell to buyers
- ***Waste Diversion:*** preventing waste from being sent to landfill through various methods
- ***Waste Minimization:*** process of reducing the amount of waste generated

Other Waste Terms

- ***Anaerobic Digestion with Energy Recovery:*** The process of using microorganisms to break down organic material in the absence of oxygen. The anaerobic digestion process produces a biogas and is considered an acceptable means of waste diversion when the gas is captured and reused as an energy source
- ***Alternative Daily Cover:*** Material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging
- ***Beneficial Reuse:*** Reusing a waste material that would otherwise be discarded in a manner that makes it a valuable commodity
- ***Commercial and Industrial Waste:*** Waste generated in either a commercial or industrial setting
- ***Composting:*** Process of decaying organic material to be used as plant fertilizer
- ***Construction and Demolition Waste (C&D):*** Waste generated during construction and demolition
- ***Energy Recovery (Waste-to-Energy (WtE)):*** Process of generating energy in the form of electricity or heat from the primary treatment of waste
- ***Hazardous Waste:*** Waste which has substantial or potential threats to public or environmental health
- ***Incineration:*** The destruction of material through burning
- ***Municipal Solid Waste (MSW):*** Waste consisting of everyday items
- ***Non-Recoverable Materials:*** *Materials that cannon be recovered, especially from waste materials*
- ***Pyrolysis:*** The heating of an organic material in the absence of oxygen
- ***Residual Waste:*** Non-hazardous industrial waste
- ***Sustainable Materials Management:*** Approach to using and reusing materials more productively over their entire life cycles and using preferred end-of-life treatment methods
- ***Universal Waste:*** Can include lamps, pesticides, batteries, mercury containing equipment, ballasts, etc.

Poll: Of the types of waste infrastructure listed, which has the most locations in the U.S.?

Please respond to the Zoom poll

Answer: Curbside Recycling

U.S. Solid Waste Infrastructure

U.S. Solid Waste Infrastructure

Infrastructure	Number
Curbside Recycling Programs	9,000+
Material Recovery Facilities (MRF)	586
Transfer Stations	3,350
Compost Sites	2,300
Mixed Waste Processing Facilities & Hybrid MRFs	70*
Anaerobic Digestion (Stand-alone)	25
Waste-to-Energy	76
Landfills	1,908

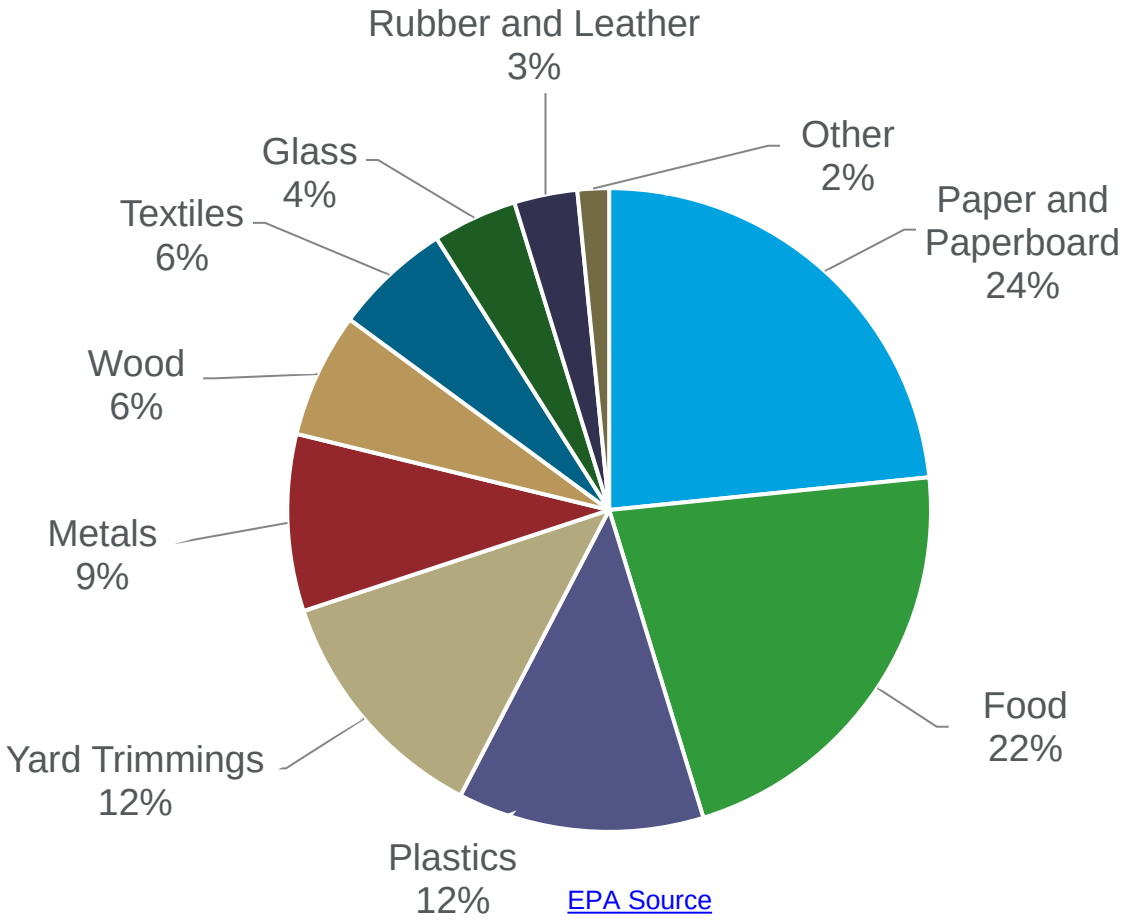
*Excludes facilities that solely produce refuse-derived fuel
Source: GBB, 2017 from various.

Solid Waste Management Options

- Solid waste collection
- Recycling
- Organics
- Waste conversion
- Landfilling

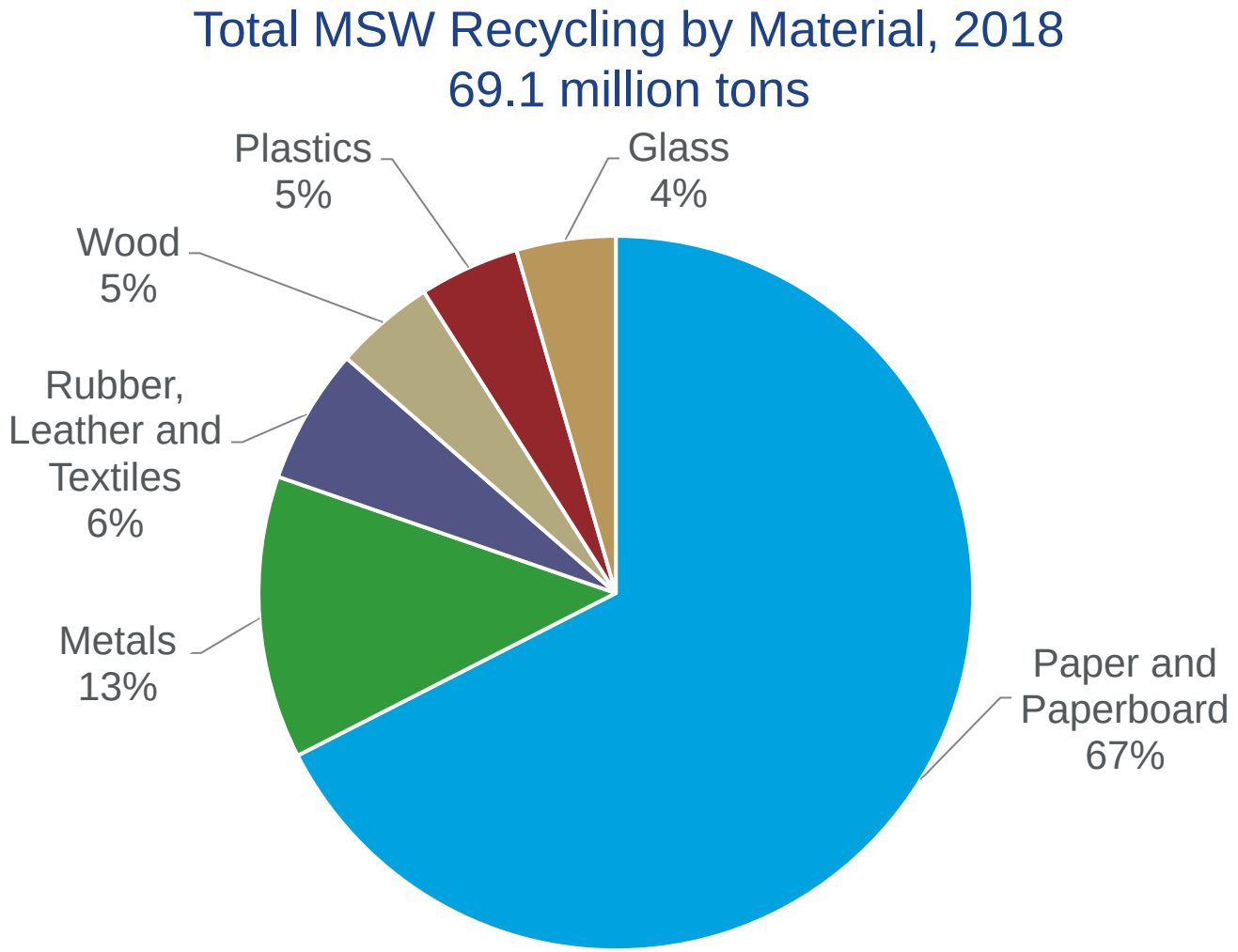
US Waste Overview per EPA

Total MSW Generated by Material, 2018
292.4 million tons



EPA Source

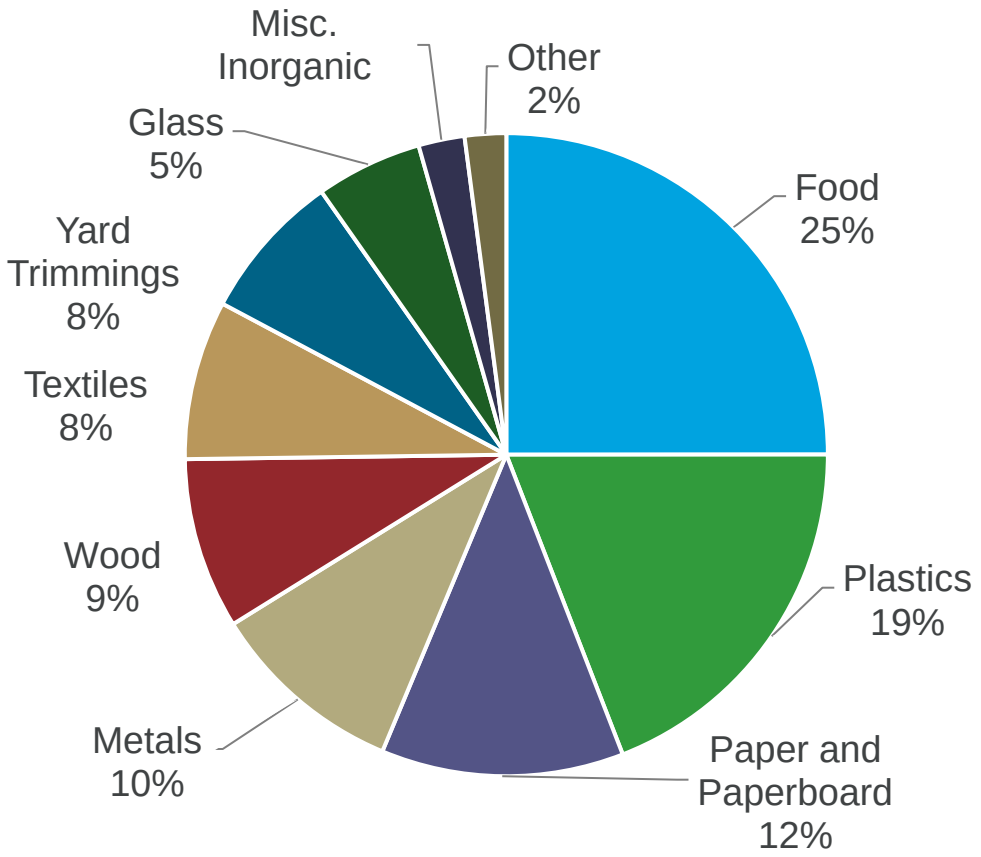
US Waste Overview per EPA



EPA Source

US Waste Overview per EPA

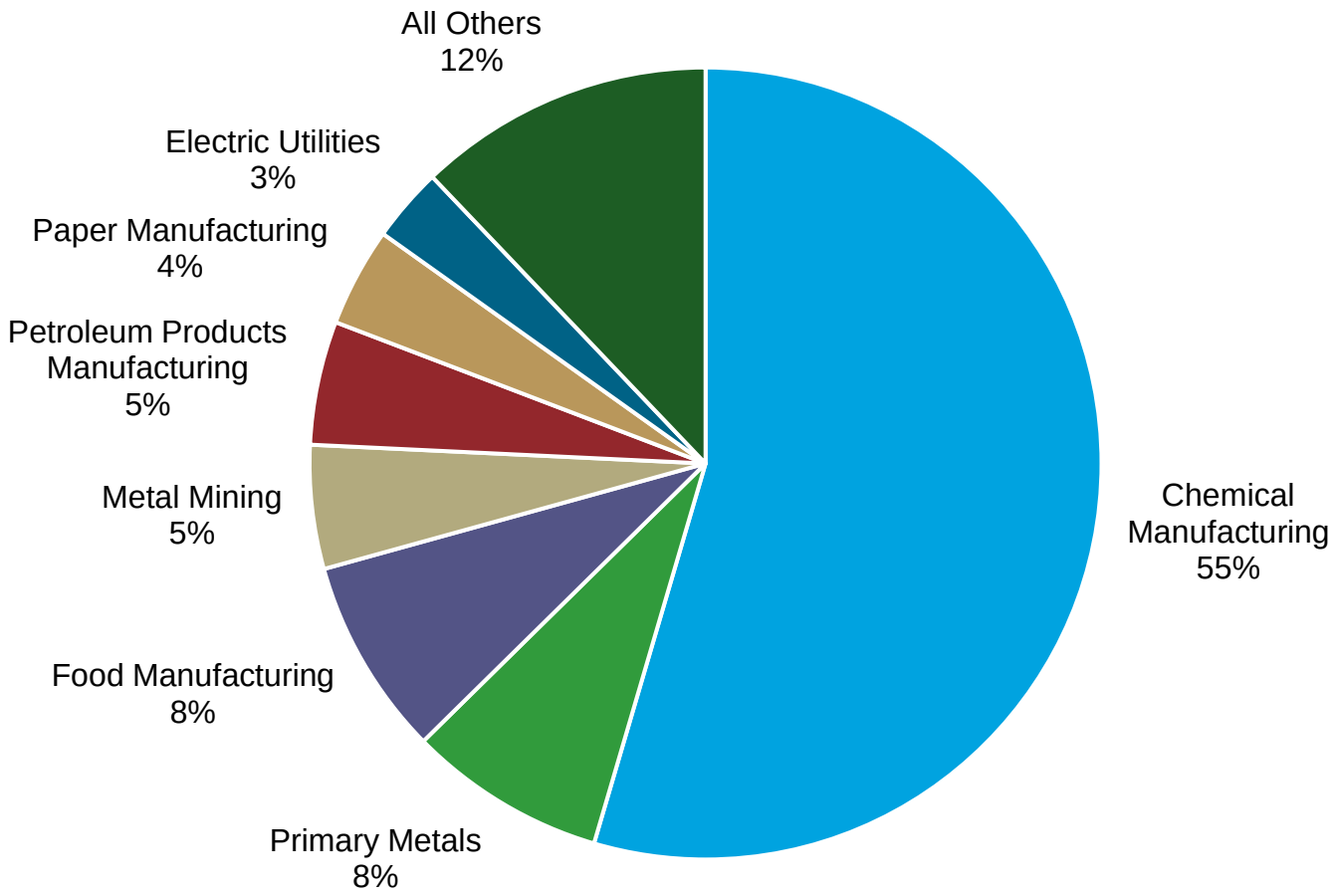
Total MSW Landfill by Material, 2018
146.1 million tons



EPA Source

Waste by Industry per EPA

Production-Related Waste Managed by Industry, 2022
28.6 billion pounds



EPA Source

Chemical industry includes:

- Pharmaceuticals
- Cleaning and personal care
- Coatings and adhesives
- Basic chemicals
- Resins and synthetic rubber

Waste and Sustainability

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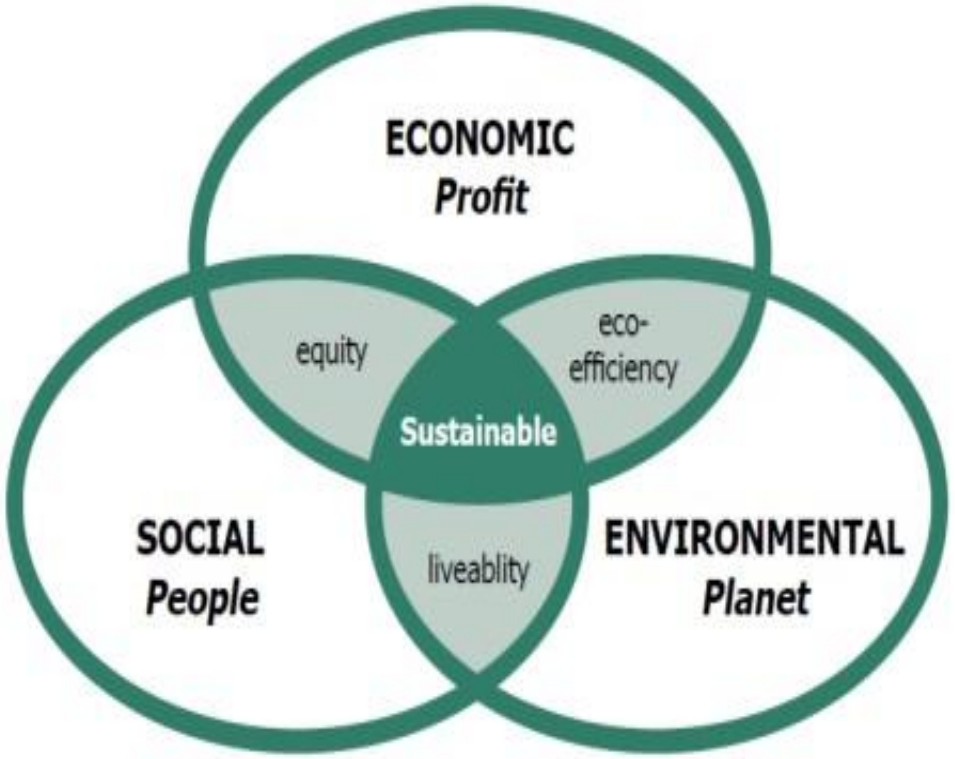
Sustainability

Economic Performance
Sustained profits, increased market share, shareholder value, innovation

Environmental Performance
Reduced waste, resource and energy consumption equals significant cost savings

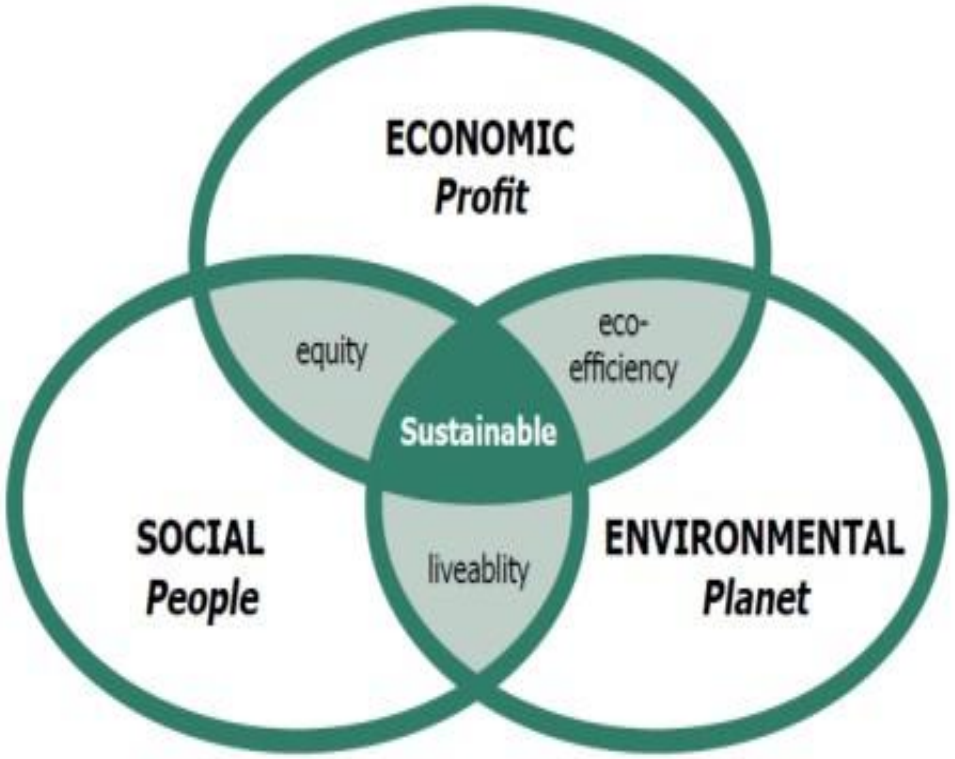
Equity/Social Performance
Customers, employees, community connections



Sustainability

Just as the Triple Bottom Line categories overlap to represent sustainability, many concepts in waste diversion and minimization overlap as well

As such, some information will be repeated and presented alongside different topics in various weeks to show how interconnected sustainability truly is



Question: What does waste mean to you and your company?

Please type your answers in the chat

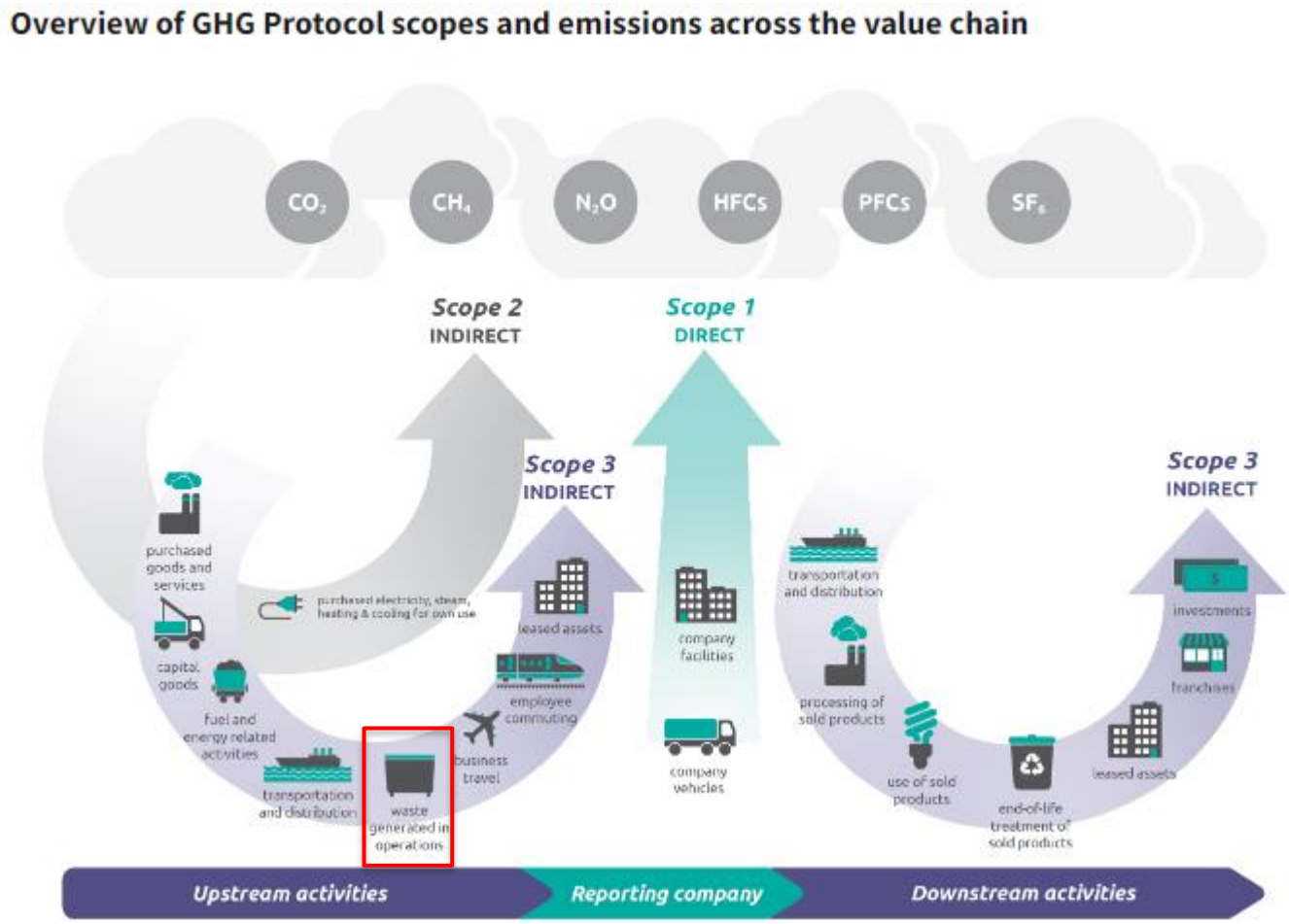
Waste and Lost Resources

- Any input that does not end up in the final product is “waste”
- Waste equals lost profit and includes:
  - Waste heat, energy, and water
  - **Expired raw materials** and **support materials**
  - **Packaged goods** which fail quality tests
  - **Bulk product** waste
  - Air and water emissions
  - **Supplier packaging**
  - General **inefficiency**

Benefits to Waste Minimization

- Reduce disposal and management costs
- Improve worker health and safety
- Reduce impacts of regulatory requirements
- Minimize potential environmental liability
- Reduce company emissions
- Demonstrate environmental leadership to stakeholders
- Improve public image

Scope Emissions



GHG Protocol

OWNED DIRECT EMISSIONS

Scope 1: GHG emissions from equipment and vehicles owned and controlled by the company that burn some type of fuel (natural gas, gasoline, diesel, etc.) or from emissions of refrigerants, industrial gases or pipelines (fugitive emissions)

OWNED INDIRECT EMISSIONS

Scope 2: GHG emissions from utilities purchased by the company (electricity, steam, chilled water, etc.)

UNOWNED INDIRECT EMISSIONS

Scope 3: All other GHG emissions that are linked to the company but do not fall into the other categories; they can occur upstream and downstream

Landfill Waste = Future Scope 3 Methane Emissions

5 WASTE

5.1 CH_4 EMISSIONS FROM SOLID WASTE DISPOSAL SITES

5.1.1 Methodological issues

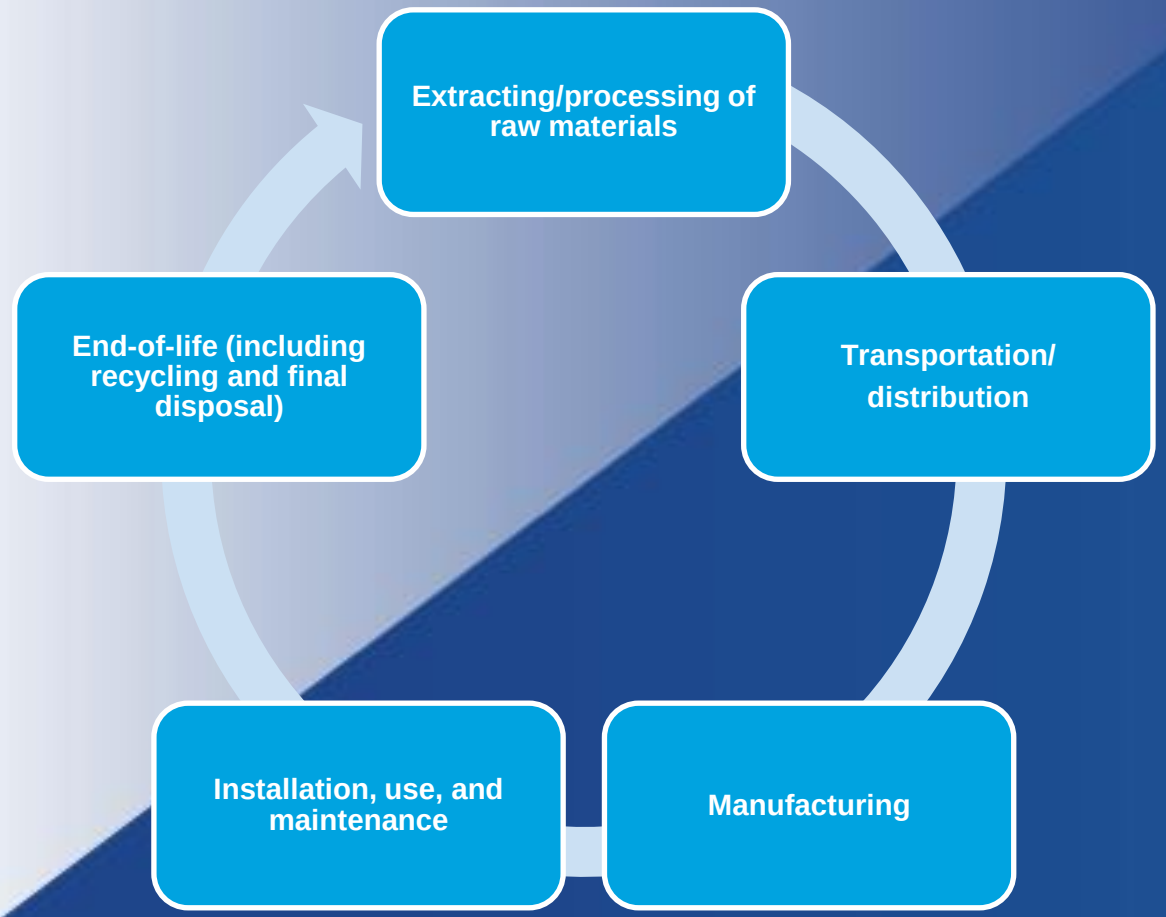
Methane (CH_4) is emitted during the anaerobic decomposition of organic waste disposed of in solid waste disposal sites (SWDS). Organic waste decomposes at a diminishing rate and takes many years to decompose completely.

5.1.1.1 CHOICE OF METHOD

The *Revised 1996 IPCC Guidelines for National Gr*
methods to estimate CH_4 emissions from solid waste
Order Decay (FOD) method (Tier 2). The main diff
produces a time-dependent emission profile that bette
time, whereas the default method is based on the ass
waste is disposed of. The default method will give a re

- Methane (CH_4) is estimated to have a GWP of 27-30 over 100 years (Learn why EPA's U.S. Inventory of Greenhouse Gas Emissions and Sinks uses a different value.). CH_4 emitted today lasts about a decade on average, which is much less time than CO_2. But CH_4 also absorbs much more energy than CO_2. The net effect of the shorter lifetime and higher energy absorption is reflected in the GWP. The CH_4 GWP also accounts for some indirect effects, such as the fact that CH_4 is a precursor to ozone, and ozone is itself a GHG.

What is Life Cycle Assessment?



Life Cycle Assessment (LCA)

- An analytical tool used to comprehensively **quantify** and interpret the **environmental impacts** of the entire life cycle of a product or system
- Methodology used to determine the embodied carbon, or **greenhouse gas (GHG) emissions** associated with the life cycle of a product
- Basis for the development of **Environmental Product Declarations**
- Requires specific and detailed information on raw materials, supplier locations, manufacturing/processing procedures, waste generation, transport, and end of life

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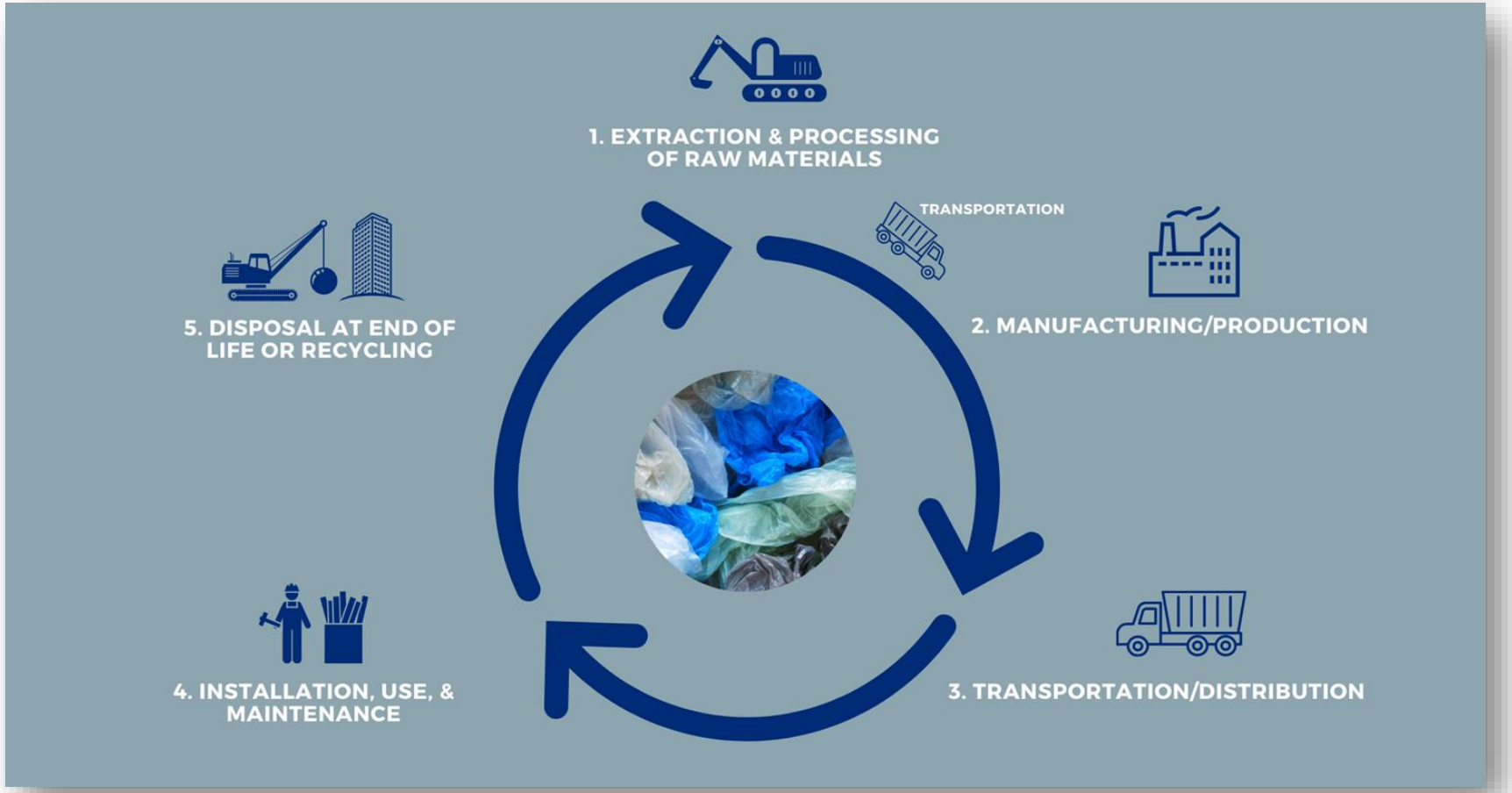
Product Life Cycle

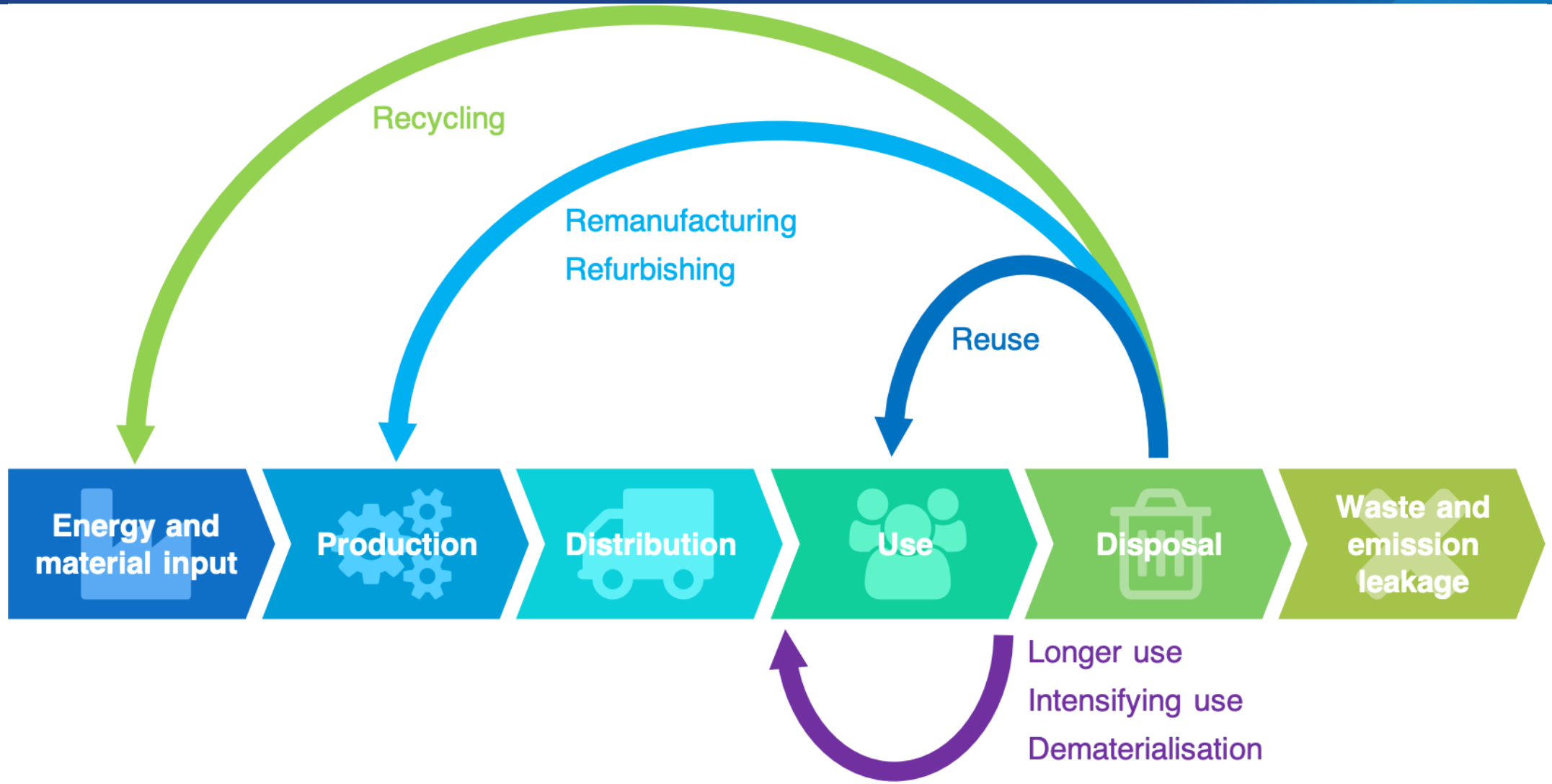


What is the Circular Economy?

Evolution from a linear system to a circular approach

- Change does not occur only through recycling – it requires life cycle thinking and multiple strategies and approaches

What is the Circular Economy?



Waste Diversion Hierarchy

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Poll: Which of the following is the least preferred method of waste diversion?

Please respond to the Zoom poll

Answer: Landfill

EPA Waste Management Hierarchy

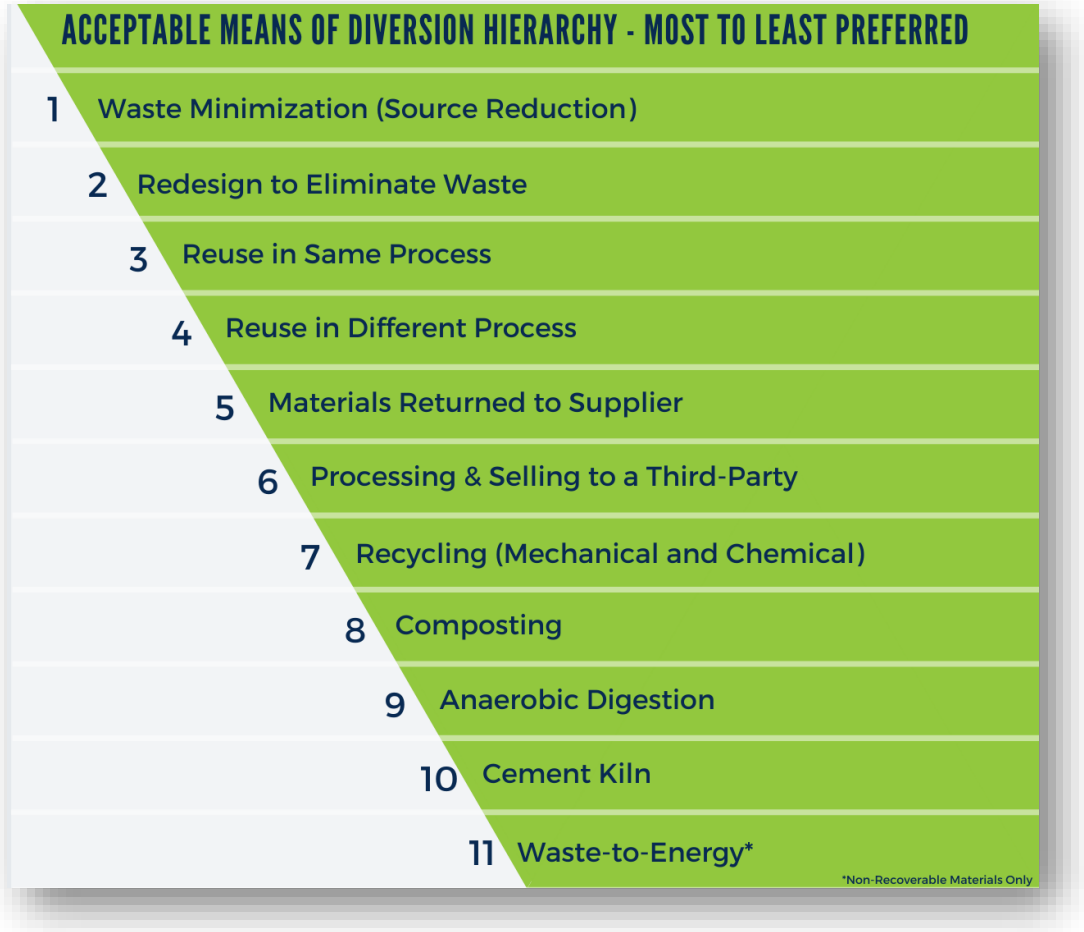
EPA Waste Management Hierarchy

Sustainable Solutions Corporation Waste Diversion Hierarchy

Upper

Middle

Lower



Question: Why are some strategies listed higher than others on the waste diversion hierarchy?

Please type your response in the chat

Answer: Strategies higher on the hierarchy keep materials in use while reducing raw material consumption and cost. Middle-tier strategies also help reduce raw material consumption; however, materials may need processed or reprocessed. Strategies near the bottom do not keep waste in a reusable state, but avoid landfills.

Instituting Waste Diversion Hierarchy Strategies

Upper Tier

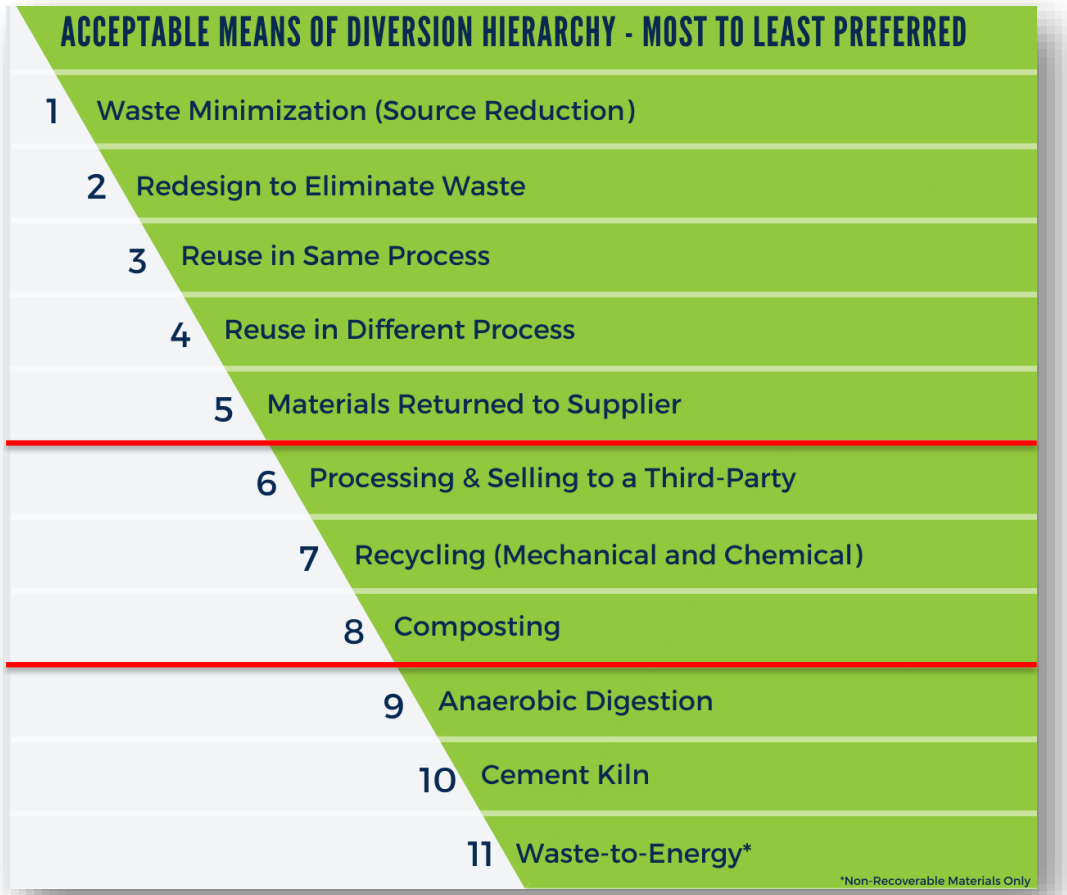
- Requires a critical review of current processes and procedures
- Multiple personnel may need to be involved to create a resolution
- May require coordination with supply chain

Middle Tier

- Identification of outlets
- Increased coordination of material segregation on site

Lower Tier

- Less availability
- Increased coordination of material segregation on site



Sustainable Materials Management – Decision Matrix Case Study

	Desirability	Feasibility	Viability	Impact
Pyrolysis	Low/Medium	Low	Low	High
WtE	Medium	High	High	Medium
Recycling	High	Medium	Medium	Low
Composting	High	Low/Medium	Low	N/A
Landfill	Low	High	High	High

- Pyrolysis is difficult to execute at this point, in addition to having poor desirability and higher impacts
- Waste-to-energy is a more affordable and easily accessible option; however, the associated environmental impacts are greater and has less desirability than other options
- Recycling is very desirable and has lower impacts, but it is more expensive and complicated to execute
- Composting is desirable, but nationwide coverage is limited, and compostable materials are expensive

Hierarchy Overview

Source Reduction

General Principles:

- Minimize packaging waste from suppliers
- Prevent expiration and damage to materials and products
- Optimize material usage

Examples:

- Install silos or holding tanks onsite to reduce packaging waste
- Institute supplier or customer takeback program
- Install conductivity meters on chemical tanks
- Adjust allowable quality limits

Hierarchy Overview

Redesign

General Principles:

- Adjust standards and procedures to maximize the use of materials
- Evaluate machinery and production design for inefficiencies and inconsistencies

Examples:

- Use a sensor instead of operator discretion
- Increase quality checks to reduce reworking of materials
- Design production flow so that common materials are mixed first and then unique materials in separate tanks later

Hierarchy Overview

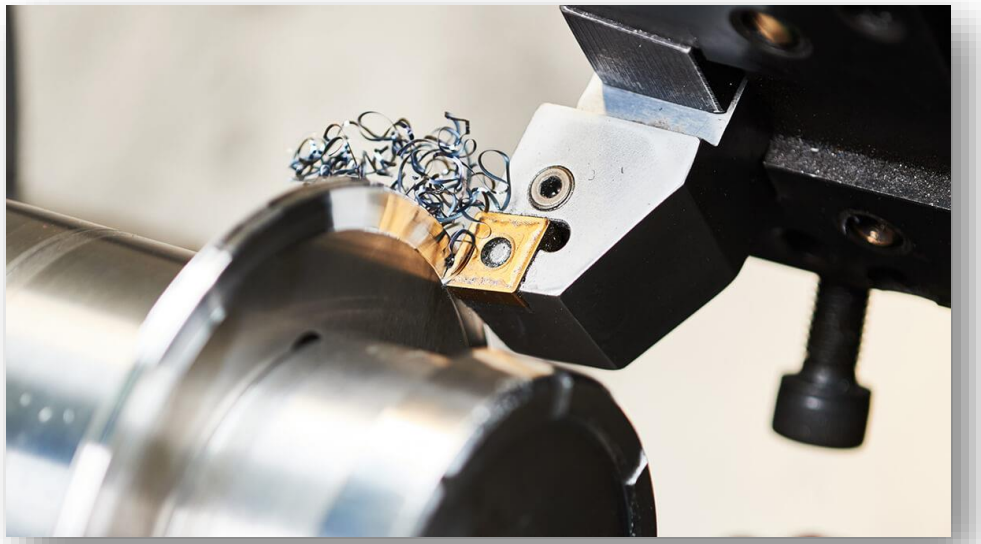
Reuse in Same Process

General Principles:

- Capture production waste to be reused as raw materials within the same process

Examples:

- Collect trimmings, shavings, turnings, etc. to be remelted and mixed with raw materials
- Capture products whose packaging fails quality checks to re-package or mix in new batches
- Re-process off-spec products to avoid using virgin materials



Hierarchy Overview

Reuse in Different Process

General Principles:

- Capture production waste, like byproducts and scrap, to be used as raw materials for a different process

Examples:

- Utilize Fly ash in cement
- Remelt scrap plastics and use as raw material
- Use rubber from tires on playgrounds

Hierarchy Overview

Materials Returned to Supplier

General Principles:

- Develop reusable and returnable packaging programs with suppliers

Examples:

- Collect and return cardboard cores from reels
- Return secondary raw material packaging like totes, supersacks, drums, pallets, etc.
- Return raw material scraps

Hierarchy Overview

Processing & Selling to a Third Party

General Principles:

- Develop a partnership with a third-party manufacturer to provide them with production waste as a raw material in their product

Examples:

- Send scrap metal to steel mill
- Send plastic to company that makes products out of recycled plastic
- Send unwanted aggregate to be used in roads
- Compost organic waste and sell to landowners

Hierarchy Overview

Recycling

General Principles:

- Identify recycling outlets for waste streams
- Ensure proper separation of materials at sites to minimize contamination

Examples:

- Bale cardboard, plastic film, and paper
- Pelletize plastics
- Companies are developing technology to recycle niche waste streams like PPE and lab plastics

Hierarchy Overview

Composting

General Principles:

- Collect organic waste and food scraps to be composted

Examples:

- Institute compost collection in break rooms, cafeterias, and kitchens
- Adjust from single use plastics to bio-based materials which can be composted

Hierarchy Overview

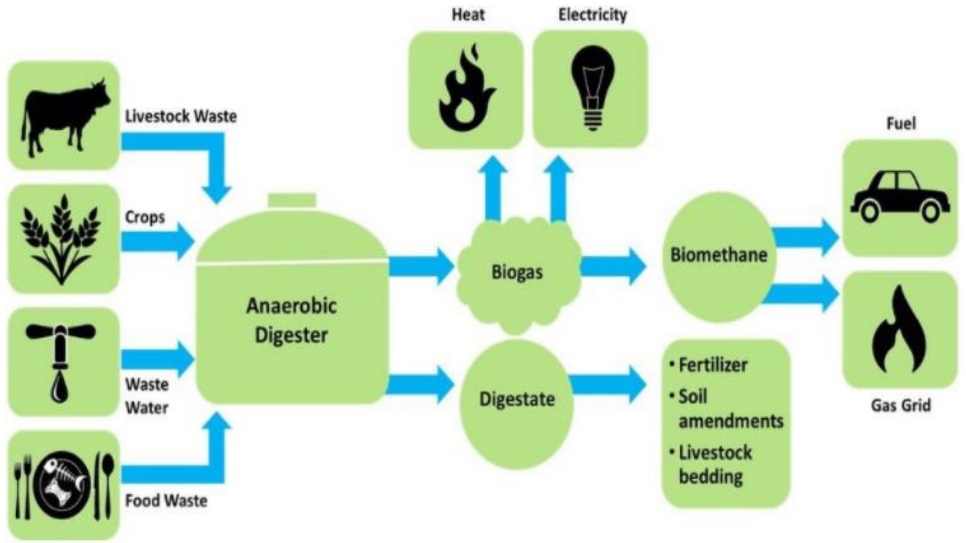
Anaerobic Digestion

General Principles:

- Collect organic material to be treated using microorganisms, producing biogas that can be reused as an energy source

Examples:

- Institute collection in break rooms, cafeterias, and kitchens
- Install small system onsite



Hierarchy Overview

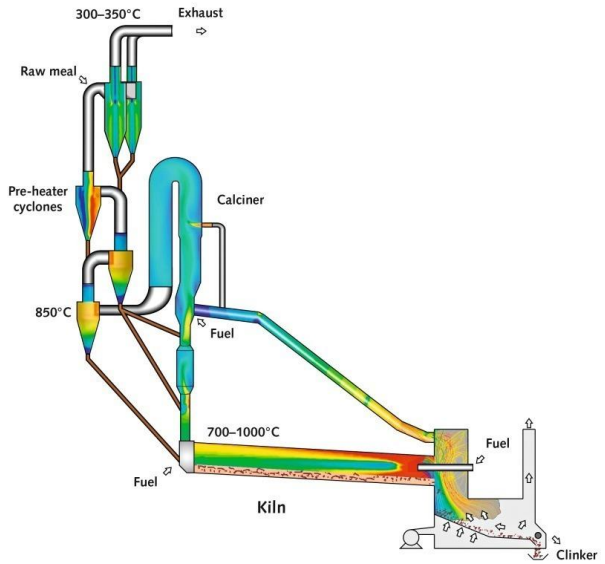
Cement Kiln

General Principles:

- Utilize as a low-priority option
- Ensure that any divertible materials are separated from streams going to cement kilns

Examples:

- Collect the following to send to cement kilns:
  - Oils, fuels, filter cakes, rubber, absorbents, wood, and more
- Cement kilns will not accept:
  - Hazardous waste, food waste, construction and demolition materials, metals, and municipal solid waste



Hierarchy Overview

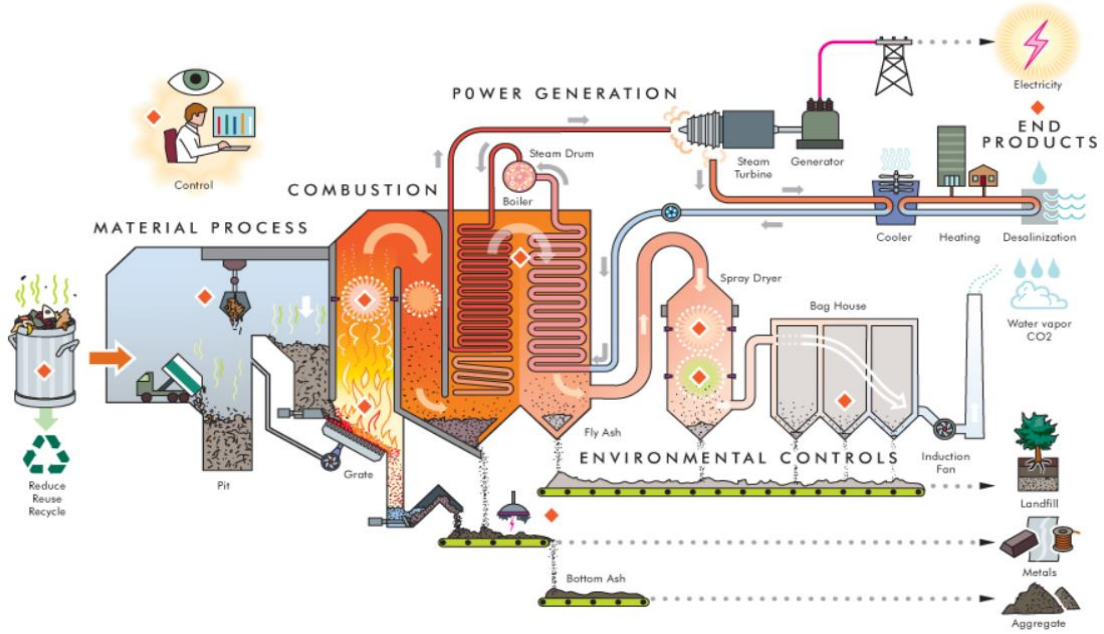
Waste-to-Energy

General Principles:

- Utilize as a low-priority option due to higher costs than other outlets
- Ensure that any divertible materials are separated from streams going to waste-to-energy
- There are not many waste-to-energy sites in the US (about 76)

Examples:

- Utilize for non-divertible materials onsite



Poll: True or false – there is little to no overlap between waste diversion strategies listed on the hierarchy.

Please respond to the Zoom poll

Answer: False

Waste Streams by Industry

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Question: What are the biggest waste streams (by weight) generated by your company?

Please type your response in the chat

Question: What are the most expensive waste streams to dispose of for your company?

Please type your response in the chat

Waste Streams Generated by All Industries

Waste Stream	Location/Processes
Plant trash	• Production areas • Breakrooms
Organics	• Breakrooms
Cardboard	• Packaging
Pallets	• Packaging
Wood	• Packaging
Scrap metal	• Equipment maintenance or upgrades
Plastic film	• Packaging
Paper	• Packaging • Offices

Waste Stream	Location/Processes
Miscellaneous plastic	• Breakrooms • Packaging
Glass	• Breakrooms • Testing containers
Foam	• Packaging
Oil/grease	• Equipment maintenance and use
Rags	• Cleaning • Maintenance
Electronic waste	• Building upgrades
Work attire/PPE	• Production areas • Testing

Waste Streams Generated in Many Industries

Waste Stream	Location/Processes
Aerosol cans/filters	• Maintenance
Batteries	• Equipment
Filters	• Baghouse • HVAC
Baghouse dust	• Baghouse
Supersacks	• Packaging for raw materials
Plastic straps	• Packaging for raw materials/finished product
Plastic totes	• Raw material transport
Cardboard gaylords	• Raw material transport

Waste Stream	Location/Processes
Start-up and shutdown packaging waste	• Packaging
Degreasers	• Water treatment
Solvents	• Water treatment • Product quality check • Material treatment
Lacquer	• Product finishing
Miscellaneous chemicals	• Water treatment • Product quality check • Material treatment
Hazardous waste (general)	• Chemical use

Waste Streams Generated by Specific Industries

Waste Stream	Industry	Location/ Processes

Sludges and swarf	• Heavy manufacturing
	  • Steel mills
	  • Automotive
	• Biomedical
		• Quenching

Blasting agents	• Heavy manufacturing	• Material/product work
Grinding wheels/saw blades	• Heavy manufacturing	• Material/product work
Refractory	• Steel mills	• Furnaces
Filter cakes	• Chemical	• Filtering liquids
Paint/ink	• Automotive • Textiles • Building products	• Finishing product

Waste Stream	Industry	Location/ Processes
Single use manufacturing materials	• Pharmaceutical	• Manufacturing
Ancillary transportation plastics	• Automotive	• Transport
Production purge	• Textiles • Building products	• Extrusion

Metal grindings, shavings, dust, and trimming	• Heavy manufacturing
	  • Steel mills
	  • Automotive
		• Material/product work

Spoiled ingredients	• Food manufacturing	• Storage
Off spec or out of date materials	• Pharmaceutical	• Storage
Scrap materials or products		• Production scrap • Quality check

Question: What are some waste streams that are specific to your site, company, or industry?

Please type your response in the chat

Key Legislation and Regulations

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Resource Conservation and Recovery Act (RCRA)

- Gives EPA authority to control hazardous waste
  - Requirements for generation, transport, treatment, and disposal
- Plethora of resources available including:
  - Standards and regulations for
    - Generators, transporters, disposal facilities, waste management programs, and more
  - Information on individual waste streams
    - Explanation of the stream itself, general insights on stream volume, generation, waste regulations, etc.
    - Amount of information varies by stream
  - Guidelines and resources for non-hazardous waste collection, storage, and disposal

RCRA Laws and Regulations

Poll: Do any of your sites have hazardous waste which is regulated by RCRA?

Please respond to the Zoom poll

Resource Conservation and Recovery Act (RCRA)

Categories of Generators

- Volume generated per month determines which regulations apply to the generator
- Very small, small, and large quantity
  - Very small
    - May not accumulate more than 1,000 kg of hazardous waste at a time
    - Someone onsite must be authorized to manage waste stream
  - Small
    - May not accumulate more than 6,000 kg of hazardous waste at a time
    - Restriction of the amount of time waste can be onsite
    - Compliances including preparedness and prevention
  - Large
    - No limit on amount of hazardous waste accumulated at a time
    - Shorter timeline waste can be onsite
    - Increased compliances for preparedness and prevention

Resource Conservation and Recovery Act (RCRA)

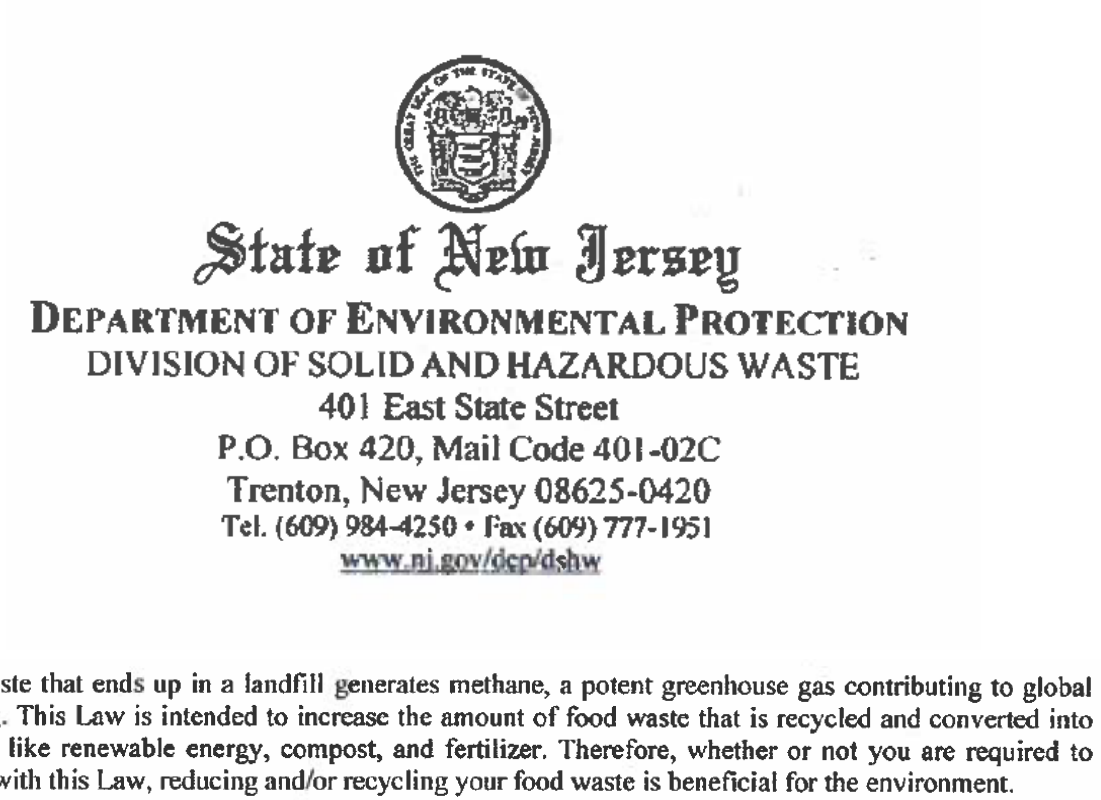
Exemptions for:

- Domestic sewage, irrigation return flows, and mineral extractions
- Closed loop recycling
  - If waste by-product is captured and reused within 90 days in the same process
- Generator Controlled Exclusion
  - Excludes wastes that are legitimately reclaimed under the control of the generator
- Transfer-Based Exclusion
  - Exempts materials transferred to a third-party for recycling or reclamation
    - Generator must show that transfer leads to legitimate reuse

Shifts in Federal Administration

- Initial actions under the current administration have shifted the federal landscape of waste regulation
- Executive Order: Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability was revoked January 20th and included requirements for agencies to:
  - Minimize waste and promote a transition to a circular economy
  - Implement sustainable acquisition and procurement policies
- The Bipartisan Infrastructure Law included funding to increase recycling infrastructure for state and local governments
  - In November of 2023, EPA awarded 25 grants totaling $72.9 million to advance reuse, recycling, composting, and anaerobic digestion
  - In 2024, EPA announced $117 million in funding under this program
- The Inflation Reduction Act
  - Applicable to petroleum and natural gas production, transport, and storage
  - Fees will be applied to companies that report over 25,000 metric tonnes of CO_2e per year that are exceeding acceptable thresholds for methane emissions

State Legislation – New Jersey



State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF SOLID AND HAZARDOUS WASTE
401 East State Street
P.O. Box 420, Mail Code 401-02C
Trenton, New Jersey 08625-0420
Tel. (609) 984-4250 • Fax (609) 777-1951
www.nj.gov/dep/dshw

Food waste that ends up in a landfill generates methane, a potent greenhouse gas contributing to global warming. This Law is intended to increase the amount of food waste that is recycled and converted into products like renewable energy, compost, and fertilizer. Therefore, whether or not you are required to comply with this Law, reducing and/or recycling your food waste is beneficial for the environment.

- An Act focused on reducing methane emissions related to food waste
  - Requires qualifying establishments to separate and divert their food waste
- A state goal of reducing food waste by 50% by 2030 from 2017 food waste emissions levels
- Plans to optimize energy recovery in wastewater treatment

Additional State Organics Recycling Laws

Organizations in New York generating more than one ton of food scraps a week must separate excess edible food for donation and send food scraps to recycling

SECTION 27-2201

Definitions

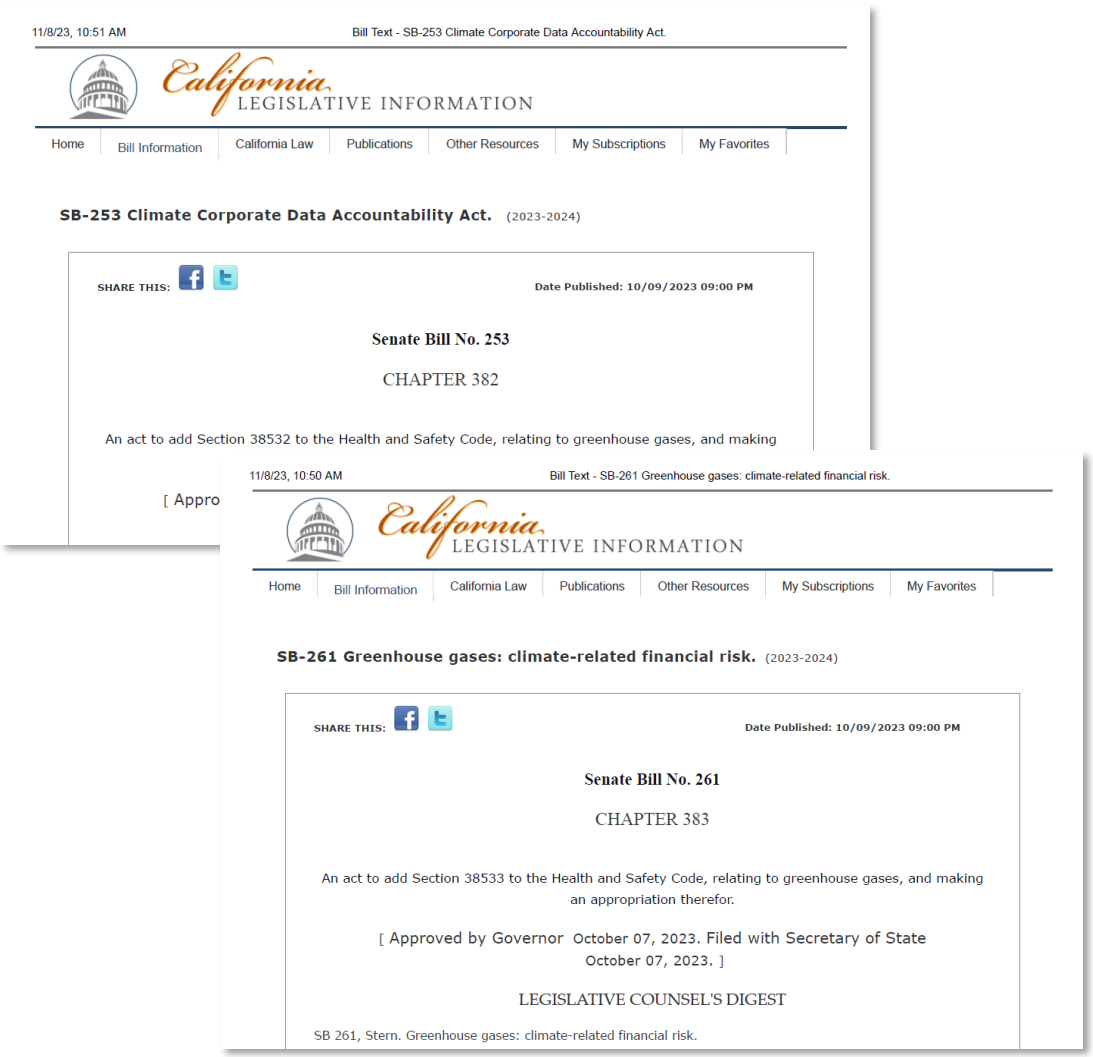
Environmental Conservation (ENV) CHAPTER 43-B, ARTICLE 27, TITLE 22

https://www.nysenate.gov/legislation/laws/ENV/27-2201

In Connecticut, organizations generating more than one-half ton a week must send food scraps to recycling

https://portal.ct.gov/DEEP/Waste-Management-and-Disposal/Organics-Recycling/Commercial-Organics-Recycling-Law

California SB 253 and SB 261



- Under California Senate Bill 253, companies doing business in California will be required to disclose Scope 1, Scope 2, and Scope 3 emissions
- California Senate Bill 261 requires companies to prepare and publicly share a report summarizing publicly available climate-related financial risk reports
- The California state assembly estimated that both bills would impact roughly 7,000 companies

California SB 54

- SB 54 aims to establish the Plastic Pollution Prevention and Packaging Producer Responsibility Act
  - Imposes minimum content requirements for single-use packaging and plastic food service ware
  - Achieved through extended producer responsibility (EPR) program
- Producers must pay $500 million per year over 10 years, starting in 2027, to:
  - Address environmental impacts of plastic pollution
  - Aid affected environmental justice communities impacted
- By 2032, the law proposes that:
  - 100% of single-use packaging and plastic food service ware in California is recyclable or compostable
  - 65% of plastic packaging and food service ware is recycled
  - 25% less plastic packaging and food service ware is sold

MassDEP Waste Disposal Bans

- In Massachusetts, the Department of Environmental protection banned landfilling and combustion of easy-to-recycle and toxic materials
  - This ban began in 1990, with additional materials introduced as recent as 2022
- Any business or institution that generates more than one half-ton of organic waste a week must divert its waste to compost, conversion, recycling, or reuse

Materials Currently Banned from Disposal or Transfer for Disposal in Massachusetts

- Asphalt pavement, brick and concrete
- Cathode ray tubes
- Clean gypsum wallboard
- Commercial food material (lower threshold effective November 1, 2022)
- Ferrous and non-ferrous metals
- Glass, metal, and plastic containers (bottles, cans, jars, jugs and tubs)
- Lead acid batteries
- Leaves and yard waste
- Mattresses (effective November 1, 2022)
- Recyclable paper, cardboard and paperboard
- Textiles (effective November 1, 2022)
- Treated and untreated wood and wood waste (banned from landfills only)
- White goods (large appliances)
- Whole tires (banned from landfills only; shredded tires acceptable)

https://www.mass.gov/guides/massdep-waste-disposal-bans

Extended Producer Responsibility

- Extended Producer Responsibility (EPR) is an environmental policy approach that holds producers responsible for the entire life cycle of their products and packaging, from raw material extraction to the final disposal
- Several states have implemented EPR laws for materials including paint, textiles, and batteries
  - California's 2024 Responsible Textile Recovery Act requires major apparel brands to manage product end-of-life, with fines for noncompliance beginning in 2030
  - Maine's 2021 Act To Support and Improve Municipal Recycling Programs and Save Taxpayer Money
- As of 2024, five states (California, Oregon, Colorado, Minnesota, and Maine) have passed EPR laws for packaging waste
  - Producers pay an annual fee towards covering the costs of collecting, transporting, and processing packaging for recycling

https://productstewardship.us/

Regulatory Drivers – Starting in Europe

Regulations	Region	Reporting requirements	Applicable to:
CSRD Corporate Sustainability Reporting Directive	EU	• Covers broadly sustainability • Double materiality – financial and world impacts, assumes climate is material • Resource use and Circular Economy specific section; Scope 1, 2, 3 • Third-party limited assurance	• Large EU companies and foreign companies doing business in EU • FYB 2025; reporting 2026 • Phase in periods; 8300 initially, 50-60K companies worldwide when fully implemented
CS3D Corporate Sustainability Due Diligence Directive	EU	• Beyond reporting - Adopt transition plan aligned with Paris agreement; net-zero by 2050 • Interim targets every 5-years • Civil liability	• Narrower than CS3D. • Start with EU companies >5000 employees, EUR 1,500m worldwide phase into Non-EU companies with EUR > 450m in EU over 5-years • First wave comes into Scope in 3-years

European Green Deal: Benefits

fresh air, clean water, healthy soil and biodiversity

renovated, energy efficient buildings

healthy and affordable food

more public transport

cleaner energy and cutting-edge clean technological innovation

longer lasting products that can be repaired, recycled and re-used

future-proof jobs and skills training for the transition

globally competitive and resilient industry

European Waste Laws

- Waste Framework Directive
  - EU's legal framework for treating and managing waste in the EU
  - The preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55% by 2025, 60% by 2030 and 65% by 2035
  - Focus on food and textile waste. Prevent waste from fast fashion and facilitate re-use. Sets ambitious targets to significantly reduce food waste by 2030
- EU Landfill Directive
  - Reduce amount of municipal waste to landfill to 10% or less of the total waste generated by 2035
- European Packaging and Packaging Waste Regulation (PPWR)
  - Reduce packaging waste, promoting reusable, and refillable packaging, and improve recycling
  - April 2024, European Parliament and Council approved rules
  - Reduce packaging by 5% by 2030, 10% by 2035, and 15% by 2040 with a focus on reducing plastic packaging waste

Packaging and Packaging Waste Regulation

- Entered into force on February 11, 2025
- Replaces the Packaging and Packaging Waste Directive to more strictly enforce the circularity goals outlined in the Green Deal
- Includes requirements for:
  - Recyclability and recycled content
  - Restrictions on single-use packaging
  - Targets for packaging reuse
  - EPR schemes

https://environment.ec.europa.eu/topics/waste-and-recycling/packaging-waste_en

Construction and Demolition Waste

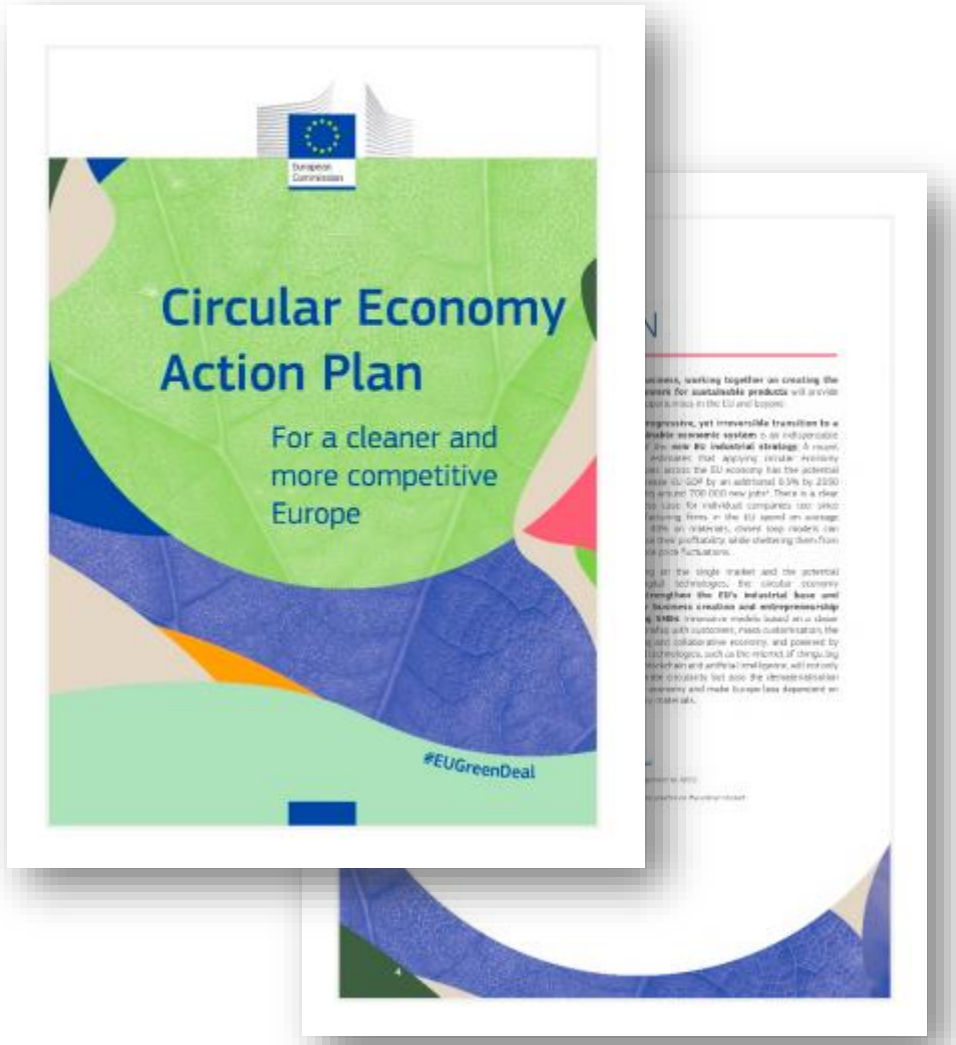
- The European Green Deal sets a C&D waste recovery target (70%) for projects throughout the European Union via its Waste Framework Directive
- CALGreen, via Senate Bill 1374, requires construction projects to recycle and/or salvage a minimum of 65% of non-hazardous C&D waste

Construction and Demolition (C&D) Diversion Informational Guide - CalRecycle

Circular Economy Action Plan

Presents measures to:

- Make sustainable products the norm in the EU
- Focus on sectors that use the most resources and have a high potential for circularity:
  - Electronics
  - Batteries
  - Vehicles
  - Packaging
  - Textiles
  - Building products
  - Food
- Pushing the commission to launch sector-specific concrete actions and requirements
- Addresses product attributes such as:
  - Reuse
  - Recycled content
  - Recyclability
  - Biobased
  - Biodegradable
  - Etc.



Closing Remarks

- Summary
  - Introduction to SSC
  - Common acronyms and terms
  - Waste hierarchy
  - Waste streams generated by industry
  - Waste legislation and regulation
- Homework!
- Next training:
  - How to effectively track and measure your waste
  - February 25, 2025

Homework Overview

- Homework will:
  - Engage participants in the topics to be discussed in the following session
  - Serve as a guide for waste diversion and minimization
- If a homework is completed, please send to presenter, Nick, at nick@sustainablesolutionscorporation.com
  - Please use the subject “Better Plants Session # Homework: Complete – Company Name”
  - Participants will be asked to share their learnings and experiences in session 8, and if you would like to participate in this, please reach out to Nick

Homework Review

Assignment

1. List the major waste streams generated onsite along with their disposition.
2. For which waste streams are data actively collected and tracked?
3. Review waste data. Are there any notable trends from the past for any specific waste stream? Were there waste minimization or diversion plans put in place because of a particular waste stream's volume, cost, etc.?
4. Look into a general trash container or dumpster. What types of materials or waste streams are present? Are any of them divertible from landfill? If so, which?

Goal

- Compile basic information related to waste
  - Utilize critical review to work on identifying issues related to waste from the data
- Prepare for the next session by reviewing waste containers onsite
  - Observe segregation, availability of containers, and container consistency

Q&A

Kahoot!

Quiz link: