



Framework for Gasification and other Advanced Technological Processes that Recycle/Convert Solid Waste

Alternative Technology Advisory Subcommittee
August 17, 2023

Highlights State's Climate goals

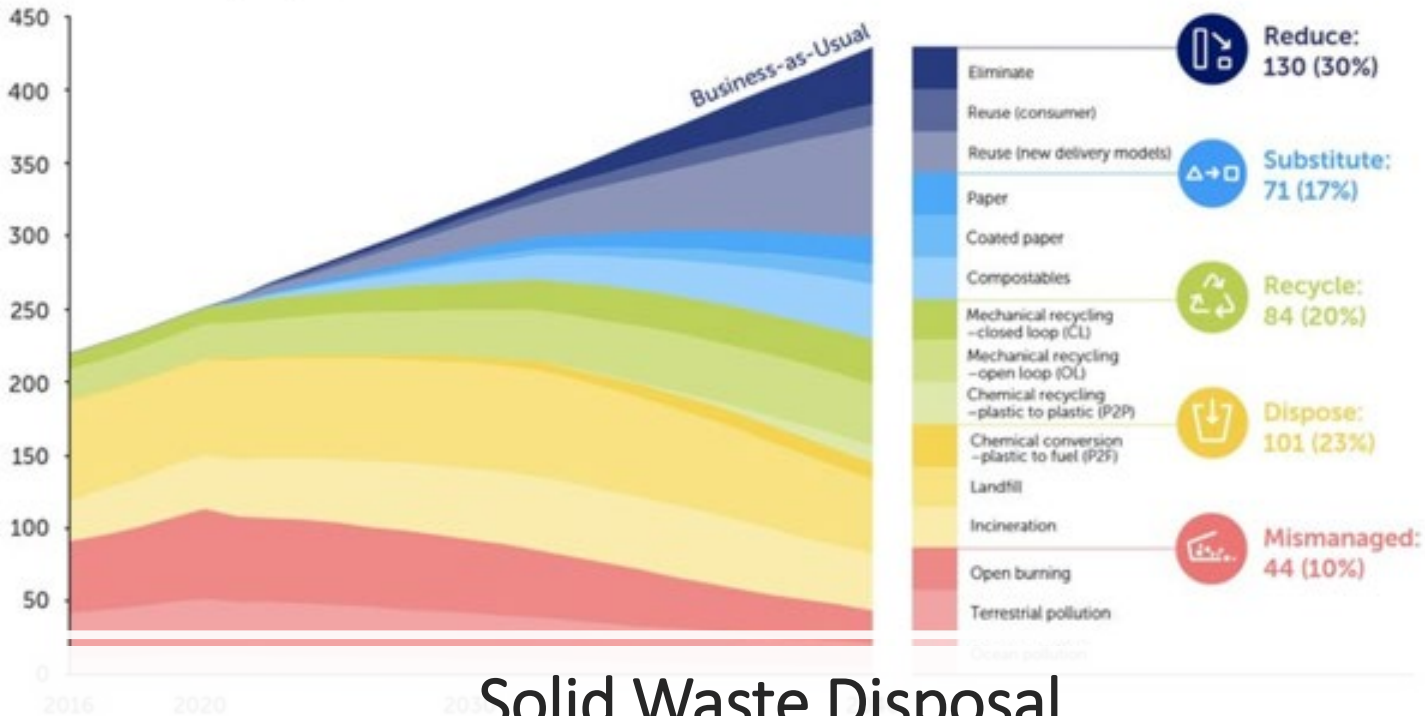
- Cutting air pollution by 71%
- Slashing greenhouse gas emissions 85% by 2045
- Reducing fossil fuel consumption to less than one-tenth of what we use today
- Creating 4 million new jobs
- Saving Californians \$200 billion in health costs due to pollution

Landmark Legislation

- Assembly Bill (AB) 939 (1989), Integrated Waste Management Act
 - Jurisdictions must divert at least 50% of their waste away from landfills
- AB 341 (Chesbro, 2011) / AB 1826 (Chesboro, 2014)
 - Requirements for commercial waste generators
- Senate Bill (SB) 1383 (Lara, 2016)
 - Requiring organic waste collection services
- SB 54 (Allen, 2022)
 - Establishes Producer Responsibility Organizations
 - Targets to prevent and reduce Single Use Plastics and Single Use Packaging (SUP).

There is a credible path to significantly reduce plastic leakage into the ocean but only if all solutions are implemented concurrently, ambitiously, and starting immediately

Million metric tons per year



This 'wedges' figure shows the share of treatment options for the plastic that enters the system over time under the System Change Scenario. Any plastic that enters the system has a single fate, or a single 'wedge'. The numbers include mechanical, and chemical...

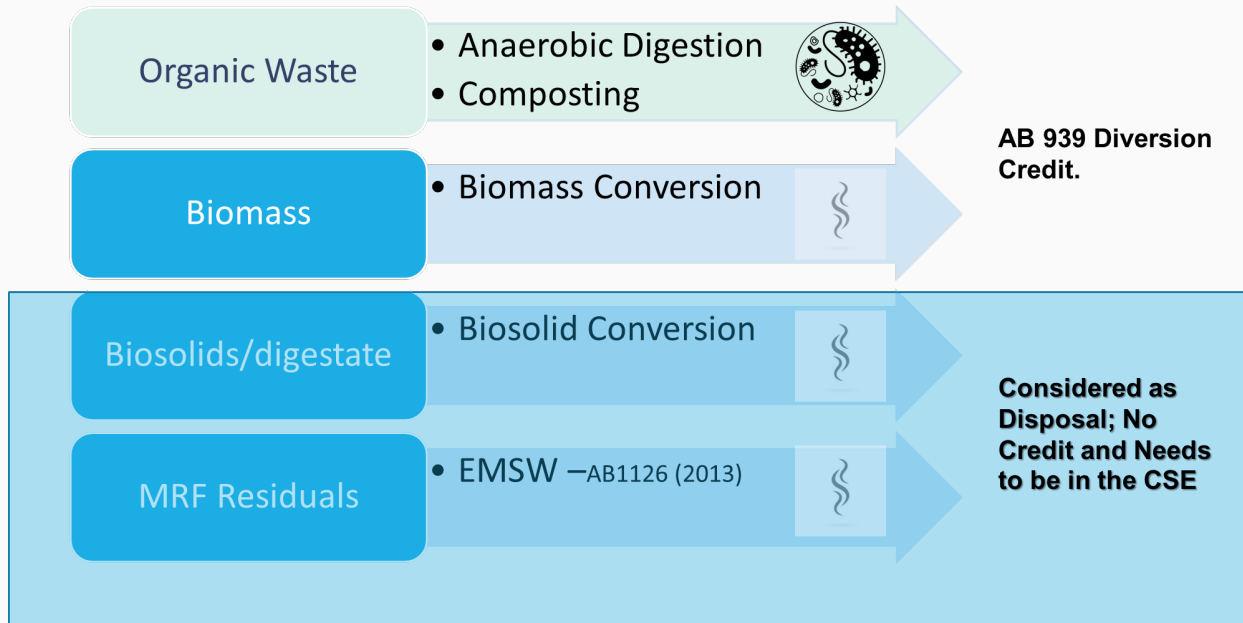
“Wedge Analysis” graph from PEW research.

Transformation

Challenges: The California Public Resources Code

- PRC 40192: “solid waste disposal,” “dispose,” or “disposal” means the management of solid waste (by) landfill disposal, **transformation, or EMSW conversion**, at a permitted solid waste facility, unless defined otherwise.
- PRC 40180: “Recycle” or “**Recycling**” means the . . . *collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.* **“Recycling” does not include transformation, or EMSW conversion.**
- PRC 40201: “**Transformation**” means **incineration, pyrolysis, distillation, or biological conversion other than composting.** **“Transformation” does not include composting, gasification, EMSW conversion, or biomass conversion.** (Note: **Incineration** is a waste treatment process that involves the combustion of organic substances contained in waste materials)
- PRC 40117: “**Gasification**” means a technology that uses a **noncombustion thermal process** to convert solid waste to a clean burning fuel for the purpose of **generating electricity**, and: . . . **does not use air or oxygen in the conversion process, . . . no discharges of air contaminants or emissions**, including greenhouse gases, . . . **no discharges to surface or groundwaters of the state . . . produces no hazardous waste . . .**
- Other clarifying changes needed to **biomass conversion** and **EMSW conversion**

Definition of Solid Waste Diversion



Definition of Recycling



“Recycle” or “recycling” means the process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace. “Recycling” does not include transformation, as defined in § 40201 or EMSW conversion.

Conflicts associated with the definition of Transformation



Can Transformation be associated with Incineration.

Combustion, Gasification, Pyrolysis and other Thermal processes

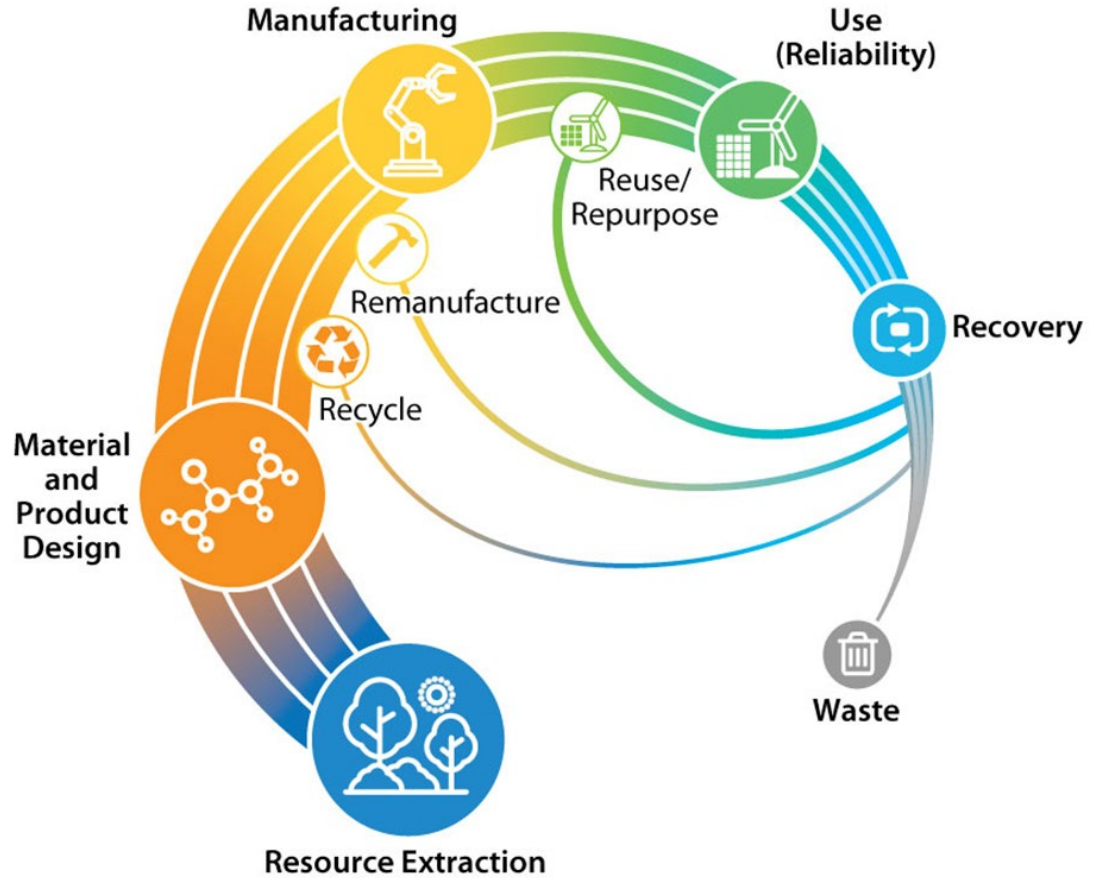
	Combustion	Gasification	Pyrolysis
Oxidizing Agent	Greater than stoichiometric supply of oxygen*	Less than stoichiometric oxygen* or steam as the oxidizing agent	Absence of oxygen or steam
Typical Temperature Range with Biomass Fuels	800°C to 1200°C (1450°F to 2200°F)	800°C to 1200°C (1450°F to 2200°F)	350°C to 600°C (660°F to 1100°F)
Principle Products	Heat	Heat and Combustible gas	Heat, Combustible liquid and Combustible gas
Principle Components of Gas	CO ₂ and H ₂ O	CO and H ₂	CO and H ₂

Comparison of Combustion, Gasification and Pyrolysis

Feedstock Limitations



End Product Limitations





**BREAK
DOWN
THE
BARRIERS**

Barriers for Implementation

Thank you!

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