CalRecycle

California's Zero Waste Plan

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Executive Summary

The California Zero Waste Plan (Plan), authorized by the 2023 Budget Act [SB 101 (Skinner, Chapter 12, Statutes of 2023)], is California's circular economy roadmap. It identifies innovative solutions to strengthen circular systems while maximizing community, economic, and environmental benefits.

The Problem

Pollution from waste contaminates our air, water, food, and land with billions in health and financial costs.

Ongoing Disparities

Disadvantaged communities with fewer resources suffer from:

- Lower recycling rates
- More illegal dumping and trash pollution

Community-based organizations and California Native American tribes (Tribes) are critical partners to:

- Address ongoing disparities
- Engage community members
- Identify solutions

Waste Disposal Still High

Despite progress expanding compost/recycling and closing incinerators in California, studies show higher disposal of materials with strong reuse and compost/recycling potential.

Benefits of Circularity

Over 40 California local governments have zero-waste strategies. Circular systems support healthier, safer, and more prosperous communities. For example, circular systems in which we prevent, rescue, and recycle organic waste can significantly reduce climate pollution; achieving SB 1383 (Lara, Chapter 395, 2016) targets will cut 3 million cars' worth of climate pollution each year. A fully circular economy could:

- Add $411 billion in annual GDP growth[1]
- Create over half a million new jobs[2]
- Avoid $11 billion in health/environmental costs[3]

The Plan

The Plan is not material-specific and has 15 recommendations that prioritize: 1) refusing to make waste and rethinking design, 2) reusing and repurposing, and 3) recycling, composting, and digesting remaining materials.

1. Policy and Regulation
    a. Adopt a framework based on the Materials Management Hierarchy (MMH)
    b. Review and align existing policies with the MMH
2. Financial Mechanisms
    a. Align market signals with circularity
    b. Establish sustainable public sector funding
3. Infrastructure for Circularity
    a. Reduce barriers to infrastructure development
    b. Grow circular businesses and develop systems for material distribution
4. Research and Innovation
    a. Support research initiatives and adoption of circular solutions
    b. Increase use of circular design principles in products and business models
5. Communication for Cultural and Behavior Change
    a. Develop communication and education campaigns based on research
    b. Make it easier to find and use zero-waste resources and tools
6. Data and Monitoring
    a. Expand and standardize data visibility for material types and management
    b. Improve and expand data analysis and monitoring

7. Community Engagement and Capacity Building
    a. Foster open dialogue with community members
    b. Engage and support capacity building for Tribes, rural, and disadvantaged communities
8. Partnerships
    a. Lead local, national, and international multi-party collaboration

CalRecycle manages waste but lacks authority over many materials and could serve as California's coordinator for a transition to a circular economy.

CalRecycle's Next Steps

CalRecycle will continue engaging interested parties, working with policymakers, providing technical support, formalizing cross-agency coordination, and partnering with communities. Components of this plan could require expanding CalRecycle's authority. The road to zero waste requires collaboration between state agencies, the private sector, and residents.

Introduction

Our Growing Waste Problem

The increasing convenience of disposable products has driven unprecedented waste.

U.S. per capita consumption of all materials increased almost sixfold — to over 12 tons per person in 2000 (nearly doubling again to 23.5 tons by 2020)[4].

California now sends over 6 pounds of waste per person, per day for disposal[5] — an amount equal to the weight of more than seven Golden Gate Bridges daily.

A holistic strategy that reframes California's relationship with materials and products can:

- Reduce the amount of waste disposed of
- Invest in the economy
- Improve public health
- Reduce climate pollutants

Supporting a Healthy Environment for All

Disadvantaged communities face more pollution and harm to public health. The Plan aligns with multi-state guidance issued by several attorneys general, including California's, emphasizing the importance of addressing inequities to ensure a healthy environment for all.

Priorities to Make Less and Reuse the Rest

California's Materials Management Hierarchy (MMH) (Figure 1) prioritizes managing materials and products for their highest and best use.

California's Materials Management Hierarchy

The MMH outlines actions to reduce and manage waste, ranked from most impactful to least desired action.

Refuse – Use fewer materials and prevent waste that must be managed.

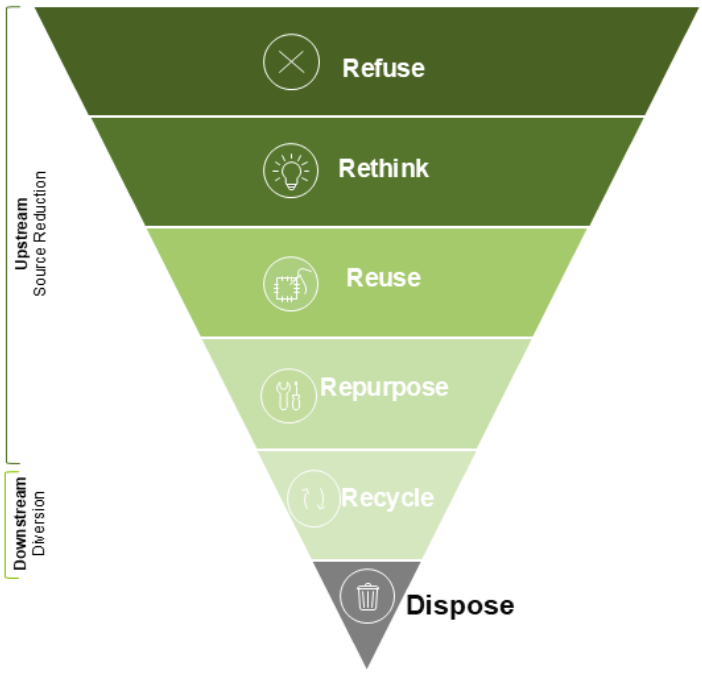
Rethink – Design systems and products to eliminate waste.

Reuse – Extend the life and value of materials through repeated use, refill, repair, and refurbishment.

Repurpose – Maximize material or product value by changing its function without processing.

Recycle – Preserve resources by processing materials through recycling, composting, and in-vessel digestion.

Figure 1: Materials Management Hierarchy



Dispose – Responsibly manage remaining materials as a last resort.

What is Zero Waste?

Zero Waste is a comprehensive approach to conserving and managing California's resources to reduce greenhouse gas emissions while protecting the environment and health for all by:

- Refusing waste through reduction and prevention
- Rethinking to design out waste
- Reusing and repurposing what we have
- Responsibly recycling, composting, and digesting remaining materials

What is the Circular Economy?

The circular economy is how we can replace today's disposable "take-make-waste" economy by:

- Eliminating waste at the design, sourcing, manufacturing, and distribution stages
- Keeping existing materials and products in use for as long as possible

These economic systems would manage materials with their highest and best use (Figure 2), retaining the value of the materials.

Zero Waste and Circular Economy Together

The circular economy, emphasizing source reduction concepts in the MMH (Figure 1), is how we will create environmental and economically beneficial systems to reach zero waste.

The hierarchy prioritizes how to manage materials for their highest and best use, with the top four tiers focused on source reduction.

Building a circular economy can address fundamental challenges to achieving zero waste and close gaps for various products and materials, such as:

- High-value materials with increasing volumes (e.g., food waste, emerging energy transition technologies like batteries, solar panels)
- Materials with limited value as a resource (e.g., single-use plastics, multi-layer packaging)
- Materials with service gaps (e.g., nonstandard organic waste, urban and agricultural wood waste, appliances, tires, small electronics like vaping devices)
- Materials with solution gaps (e.g., disaster debris, recreational vehicle and temporary encampment materials, wind turbines, medical waste, litter and illegal dumping, residuals)

Not all materials and products in California have clear recycling or composting solutions. The Plan offers a path for managing these hard-to-recycle materials through source reduction, while continuing to improve and develop new recycling solutions.

Figure 2: Circular Economy

A Zero Waste Plan for California: Vision, Impacts, and Measuring Success

The Plan, authorized by the 2023 Budget Act (SB 101), addresses all materials in the state — including those currently outside CalRecycle's authority and materials not currently considered part of a waste stream.

Vision for the Plan

The Plan will use the terms "materials management," "recovered materials management," and/or "circular materials management" instead of "waste management" to highlight the importance of using materials and products for their highest and best use before managing them as "waste."

Unlike prior plans and reports, this Plan does not focus on specific materials or policies or adjust previously set targets. Instead, it makes recommendations on how to move California towards zero waste.

This shift from California's traditional waste management approach can help surpass existing targets, including source reducing, recycling, or composting at least 75% of solid waste. The Plan provides recommendations to build systems for managing California's materials in each stage of their lifecycle, from design and manufacturing to distribution and disposal, retaining their value to California's economy.

Achieving zero waste requires coordinated action across state agencies, local governments, businesses, and communities.

The Plan is designed for flexible implementation, allowing adjustments based on data, challenges, and innovations. Some recommendations may require legislative action. CalRecycle will lead implementation of actions that can be accomplished in the short term and collaborate on actions that require longer-term strategies.

Economic Value

A full circular transition for California can add $411 billion in annual GDP, create 531,000 new jobs[6], and save Californians an estimated $11 billion in avoided annual health and environmental costs[7] by 2050. These estimates reflect the economic benefits of shifting industries toward circular business models that prioritize waste prevention and reduction, resource efficiency, and material reuse.

Reaching Broader Goals

The circular economy can help reach California's environmental and community goals.

Climate goals, for example, often focus on the energy transition. However, California will reach and potentially exceed its net-zero climate emissions goal with zero-waste solutions because 45% of climate-heating emissions come from how we make products.[8]

Investing in California's Transition

Solutions will require financial and resource investments across the state. Plan recommendations build on existing investments to lower funding needs.

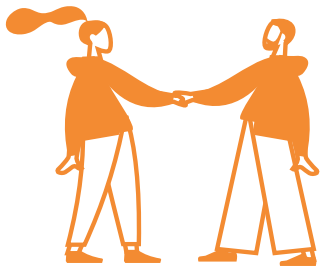
With expanded resources and authority, CalRecycle could serve as the central coordinator for the state's circular transformation.

Measuring Success

CalRecycle is committed to tracking progress. The recommended performance indicators can help evaluate the entire impact of the Plan during and after implementation. For some indicators, methodologies already exist. For others, additional resources may be needed. Specific indicators may also evolve based on individual program needs. Eight Key Performance Indicators (KPI) are suggested to track progress across the three areas:

- Our Environment
- Our People
- Our Economy

Cross-Cutting Key Performance Indicators (KPI)

Our Environment Meaningfully contribute to achieving California's climate and environmental goals.	**Our People** Californians know how and are able to easily participate in key zero-waste behaviors.	**Our Economy** California's economic growth is driven by zero waste.
Source Reduction A measurable decrease in waste generation by preventing material use at its origin through redesign, reuse, repair, or other mechanism to reduce generation. **Recycling Rate** The percentage of waste materials collected and successfully processed into new material inputs for production, reflecting the efficiency and effectiveness of recycling systems. **Environmental Impact** A measurable decrease in greenhouse gas emissions associated with materials management activities.	**Adoption** The rate at which zero-waste practices and circular economy principles are integrated into individual behaviors, community initiatives, and business operations. **Avoided Health Impacts** A reduction in negative health outcomes and associated costs due to improved waste management practices and decreased pollution. 	**Economic Impact** The number of new jobs created by zero waste and circular economy activities and businesses. **Statewide Investment** The total public and private funding allocated to circular economy initiatives and zero-waste infrastructure across California. **Circular Transition** The value of material inputs consumed as compared to GDP by industry, indicating the decoupling of resource use from economic growth.

Zero Waste Plan Overview and Connections to Baseline Report

The Link Between the July 1 Baseline Report and the Zero Waste Plan

Consistent with SB 101 (Budget Act of 2023), **the Baseline Report**, published in July 2024, evaluated the effectiveness of existing CalRecycle programs and identified six recommendations.

To improve current programs and reach zero waste, CalRecycle's Baseline Report recommended the state:

- Reach and surpass existing waste and emissions reduction mandates and goals
- Identify and address gaps and overlaps to make current waste management systems more sustainable, effective, and cohesive
- Improve understanding of the full lifecycle of materials management (including each stage from beginning to end) to reduce loss and discourage disposal within a closed-loop economy
- Combat environmental health and justice issues associated with the lifecycle of material production, consumption, and waste generation
- Maximize the environmental, social, and economic benefits of a circular economy
- Stimulate growth of California's circular economy through activities such as:
    - Redesigning products for easy reuse or recycling
    - Implementing infrastructure that reduces waste and enables reuse
    - Developing markets for recycled materials

Status Update on the Implementation of Baseline Report Improvements

While progress has been made in all of the improvement areas identified in the Baseline Report, it is often difficult to determine the extent of that progress. For example, although data indicates that California's recycling rate is improving, we are still analyzing material characterization data to identify potential gaps. This Plan outlines recommendations that, when implemented, will drive further measurable progress.

Two improvement areas — emission reductions and combating environmental health and justice issues associated with waste — saw significant progress in recent years. For example, this included the closure of California's final two waste incinerators in 2024: the Covanta plant in Stanislaus County and the Southeast Resource Recovery Facility in Long Beach. Many recommendations in the Plan support communities transitioning away from incineration toward strategies that help achieve air quality goals.

Examples of key recommendations include:

- Creating financial mechanisms that align market signals with zero waste
- Developing infrastructure to grow circular businesses and support equitable material distribution
- Engaging communities to promote continuous and inclusive input from all voices

Every recommendation in the Plan prioritizes managing materials consistent with California's MMH.

Evaluation of Newly Established and Recently Expanded Programs' Alignment with Intended Goals

Several significant pieces of new and expanded legislation have passed in the past five years. Many of these laws are still in the rule-making process and have not yet been fully implemented, making it difficult to evaluate their alignment with intended goals. These include:

- SB 54 (2022), the Plastic Pollution Prevention and Packaging Producer Responsibility Act
- SB 707 (2024), the Responsible Textile Recovery Act
- SB 1053 (2024), Solid waste: recycled paper bags, standards, carryout bag prohibition
- SB 343 (2021), "Truth in Recycling"
- AB 660 (2024), Food and beverage labeling: quality, safety, and sell-by dates

SB 1013 (2022) and SB 353 (2023) expanded the California Redemption Value system to include new beverage container types such as wine, beer, spirits, and large juice containers. This change, already in effect since 2024, has increased the total number of containers returned. SB 353 also increased the viability of recycling centers by adjusting recycling payments to be more in line with market values. This change has appeared to stabilize recycling payments for a few commodities that experienced price fluctuations since adjustments took effect in 2024. However, a longer review period is needed to fully assess the impact.

SB 1013 provides grant funding focused on the transportation, collection, and processing of empty glass beverage containers. These programs are in various stages of development and implementation.

AB 179 (Budget Bill of 2022) provides significant funding for circular infrastructure, including:

- $25 million for reusable beverage container infrastructure
- $50 million for infrastructure to improve the quality of collected beverage containers
- $47 million for payments to reclaimers and manufacturers in the Plastic Market Development Program
- Over $73 million for innovative redemption opportunities to increase consumer convenience

SB 1383 has been instrumental in increasing organics diversion from landfill. Approximately 97% of jurisdictions in California have residential organics collection, and organics diversion efforts have reduced estimated landfill volumes of organics by 7.5% between 2018 and 2021, according to the **2021 Material Characterization Study results**.

Reporting requirements for SB 793 (2020), Plastic Minimum Content Standards and Reporting for Beverage Manufacturers, have been in effect since 2022. The law established recycled content standards for beverage manufacturers that sell more than 16 million units per year, starting at 15% recycled content, then increasing to 25% in 2025, and up to 50% by 2030. A study is currently underway to analyze the availability of post-consumer recycled material available in the market.

AB 1857 (2022), the Zero Waste Transition Act, successfully aligned with the intended goal of disincentivizing the use of incinerators as renewable energy and landfill diversion solutions. The legislation redefined incineration as disposal, preventing a portion of incinerated waste to be counted towards a jurisdiction's landfill diversion credit. These adjusted incentives, combined with economic realities — incinerators no longer able to classify their energy sold to the market as "renewable energy" along with the higher associated rates — resulted in the last two incinerators in California closing over the past two years.

Plan Structure and Components

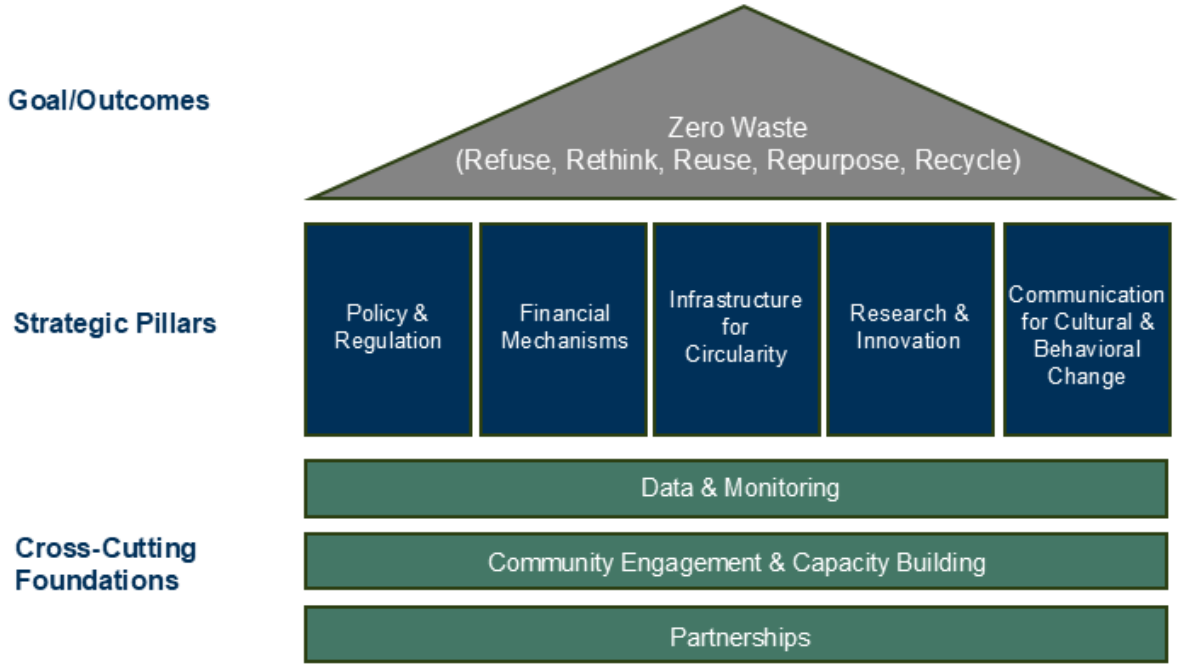
California's transition to a circular and zero-waste economy requires a holistic and adaptable approach**.** The Plan is intentionally high-level to provide clear direction while remaining flexible enough to accommodate evolving needs and emerging opportunities.

The Plan connects long-term vision with immediate, tangible actions to ensure lasting environmental, economic, and social benefits, while aligning interests and fostering collaboration.

- **Focus Areas:** The Plan is organized into eight focus areas**,** each representing a thematic priority. These focus areas are grouped into five strategic pillars (policy and regulation, financial mechanisms, infrastructure for circularity, research and innovation, and communications for cultural and behavioral change) that address systemic changes needed for materials management and waste prevention**.** Additionally, three cross-cutting foundations (data and monitoring, community engagement and capacity building, and partnerships) support the implementation of the Plan's recommendations (Figure 3).

- **Future States:** Each focus area has an associated future state, which describes the long-term vision for what successful implementation should achieve.

Figure 3: California's Zero Waste Plan



- **Recommendations**: The Plan outlines 15 recommendations that are material-agnostic, meaning they are intended to apply to all materials and products. They are inclusive of both upstream and downstream interventions, demonstrated by example outcomes across the MMH.

- **Pathways:** Each recommendation includes two to five specific pathways, which outline primary avenues for implementation. These pathways are not exhaustive. Recommendations offer infinite opportunities for small- and large-scale initiatives. The flexibility of these pathways ensures that the Plan remains adaptive to new opportunities, technologies, and policies that support circularity.

- **Key Actions:** The Plan identifies several key actions, which are specific steps for implementation**.** These key actions serve as a starting point and are not a comprehensive list of every step needed to implement a recommendation.

- **Key Parties for Implementation:** Achieving zero waste requires action and collaboration across many interested parties**.** The individuals and entities who support and execute the actions to implement this Plan are included in each recommendation table.

- **Timeline Scenario:** In the What's Next for California section, the Plan includes a 2045 scenario for implementing the 15 recommendations. This provides a structured yet flexible approach to planning.

Visual Guide

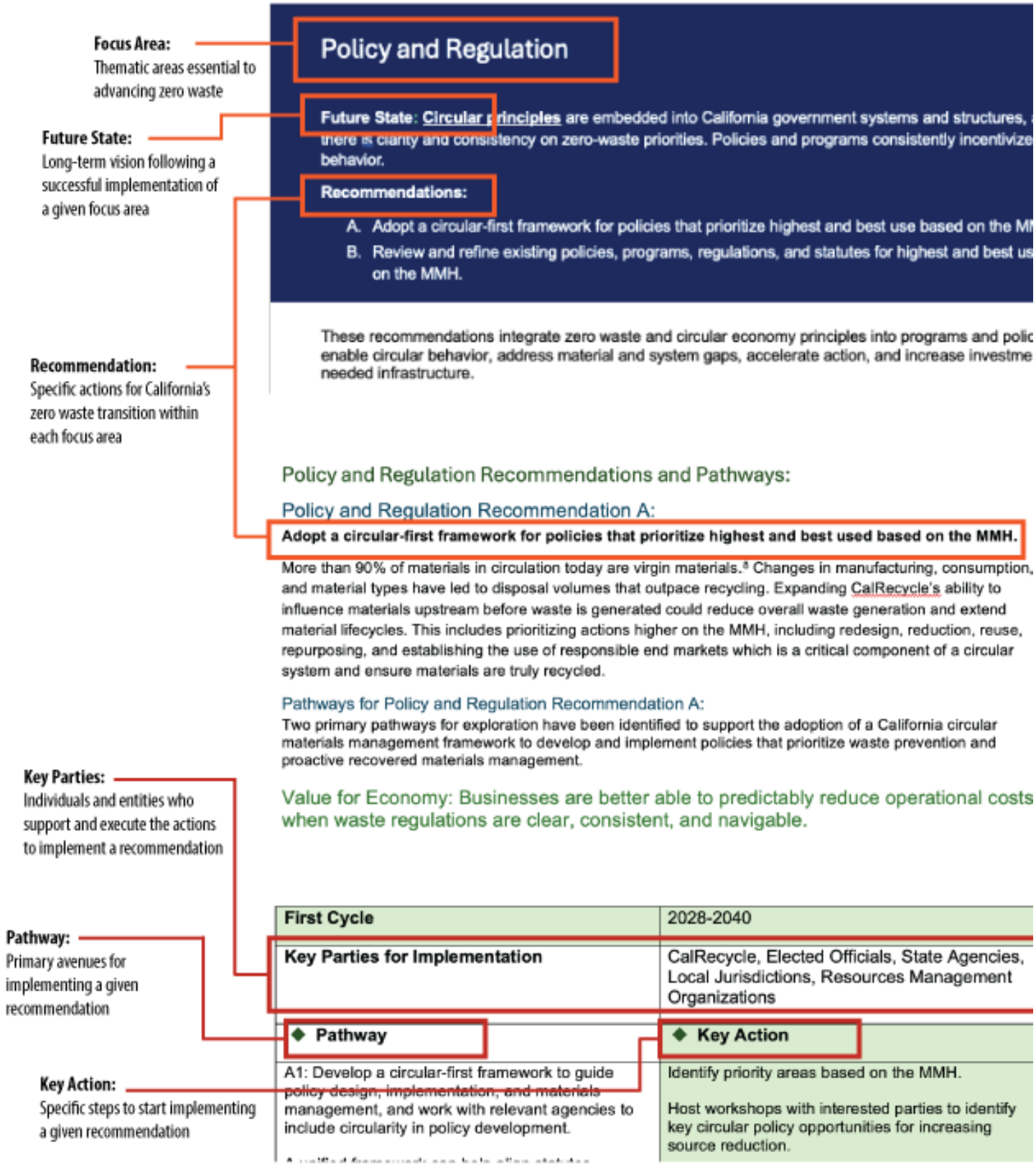


Figure 4: Visual Guide

Focus Area	Recommendations
Policy and Regulation	A: Adopt a circular-first framework for policies that prioritize highest and best use based on the MMH. B: Review and refine existing policies, programs, regulations, and statutes for highest and best use based on the MMH.
Financial Mechanisms	C: Align market signals with zero waste and circular behavior. D: Establish sustainable public sector funding that supports a circular economy.
Infrastructure for Circularity	E: Reduce challenges and increase benefits for infrastructure development and modifications. F: Grow circular businesses and develop systems for equitable distribution of materials.
Research and Innovation	G: Support research initiatives and the development, adoption, and scaling of circular solutions. H: Increase use of circular design principles in products and business models.
Communication for Cultural and Behavioral Change	I: Develop tailored communication and education campaigns based on research of Californians' behaviors, beliefs, needs, and interests. J: Make it easier to find and use resources and tools for zero waste.
Data and Monitoring	K: Expand and standardize data visibility across material types and management pathways through open and crowdsourced data. L: Improve and expand data analysis and monitoring to inform new solutions and refine existing systems.
Cross-Cutting: Community Engagement and Capacity Building	M: Foster open dialogue with community members to integrate continuous and inclusive input from all voices. N: Proactively engage and support capacity building for Tribal, rural, and environmentally burdened communities to participate in California's circular transition.
Cross-Cutting: Partnerships	O. Lead local, national, and international multi-party collaboration to support zero-waste implementation.

Policy and Regulation

Future State: Circular principles are embedded into California government systems and structures, and there is clarity and consistency on zero-waste priorities. Policies and programs consistently incentivize circular behavior.

Recommendations:

A. Adopt a circular-first framework for policies that prioritize highest and best use based on the MMH.

B. Review and refine existing policies, programs, regulations, and statutes for highest and best use based on the MMH.

These recommendations integrate zero waste and circular economy principles into programs and policies to enable circular behavior, address material and system gaps, accelerate action, and increase investment in needed infrastructure.

Policy and regulation example outcomes along the MMH include:

- **Refuse**: Restrict products that are hazardous or incompatible with a circular economy
- **Rethink**: Incorporate circular design principles that extend the life of a product
- **Reuse:** Revise programs and legislation to support reuse, repair, and refurbishment
- **Repurpose:** Expand opportunities for materials management by changing the function of the product or material
- **Recycle:** Redefine what is considered recycling in California's circular management framework to ensure materials considered to be recycled are actually reused to make new products

Policy and Regulation Recommendations and Pathways:

Policy and Regulation Recommendation A:

Adopt a circular-first framework for policies that prioritize highest and best used based on the MMH.

More than 90% of materials in circulation today are virgin materials.[9] Changes in manufacturing, consumption, and material types have led to disposal volumes that outpace recycling. Expanding CalRecycle's ability to influence materials upstream before waste is generated could reduce overall waste generation and extend material lifecycles. This includes prioritizing actions higher on the MMH, including redesign, reduction, reuse, repurposing, and establishing the use of responsible end markets which is a critical component of a circular system and ensure materials are truly recycled.

Pathways for Policy and Regulation Recommendation A:

Two primary pathways for exploration have been identified to support the adoption of a California circular materials management framework to develop and implement policies that prioritize waste prevention and proactive recovered materials management.

Value for Economy: Businesses are better able to predictably reduce operational costs when waste regulations are clear, consistent, and navigable.

First Cycle	2028-2040
Key Parties for Implementation	CalRecycle, Elected Officials, State Agencies, Local Jurisdictions, Resources Management Organizations
◆ **Pathway**	◆ **Key Action**
A1: Develop a circular-first framework to guide policy design, implementation, and materials management, and work with relevant agencies to include circularity in policy development. A unified framework can help align statutes, policies, and regulations for coordinated materials management across state agencies. Additional analysis is needed to identify existing gaps, including for materials outside CalRecycle's authority, that could benefit from cross-agency collaboration. Best practices could incorporate zero waste into the legislative and regulatory processes, including checklists during the legislative analysis and regulatory processes, cross-education of lawmakers and decision makers on zero waste, and cross-agency sharing for ongoing materials management. This pathway could model Extended Producer Responsibility (EPR) frameworks and policies by, for example, incorporating producers into the management process, considering upstream options including redesign, and providing compliance and enforcement mechanisms.	Identify priority areas based on the MMH. Host workshops with interested parties to identify key circular policy opportunities for increasing source reduction. Educate policymakers to increase understanding of zero waste, in particular source reduction, and connections across state policies, legislation, and regulations. Draft and publish a circular materials management framework. Pilot the framework within existing authority. Review policies from other agencies for circular potential. Collaborate with relevant agencies to incorporate circular criteria into their policy development processes. Highlight to interested parties the impacts/benefits of new policies that successfully adopt circular frameworks.
A2: Elevate circular economy as a key avenue for meeting California's key environmental, economic, health, and equity goals. This would leverage the Plan and existing initiatives to demonstrate the links to other statewide goals and communicate the concepts of zero waste and circular economy to those engaged in working toward other priority goals.	Conduct collaborative review of California's statewide goals for circular integration opportunities. Integrate circular economy priorities into statewide environmental and equity strategies. Develop a public engagement strategy to raise awareness about circular economy benefits and impacts on California goals. Set measurable KPI to track progress in achieving state goals supported by circular economy principles.

Policy and Regulation Recommendation B:

Review and refine existing policies, programs, regulations, and statutes for highest and best use based on the MMH.

Redesigning systems for circularity uses less materials and keeps products in use for as long as possible to preserve material value and reduce waste.

Pathways for Policy and Regulation Recommendation B:

Three primary pathways for exploration have been identified to support reviewing and refining existing policies, programs, regulations, and statutes to align incentives and requirements with materials' highest and best use.

First Cycle	2027-2039
Key Parties for Implementation	CalRecycle, Elected Officials, State Agencies, Local Jurisdictions, Resources Management Organizations
◆ **Pathway**	◆ **Key Action**
B1: Review key policies across state agencies to address gaps/overlaps and revise them for highest and best use at each decision point. This pathway includes: • Aligning statutes, regulations, and policies as well as rules, targets, and definitions to support the highest and best use principles • Simplifying policies where allowed action is unclear, definitions/guidance/targets are conflicting, or where current fees or financial structures disincentivize upstream solutions • Coordinating across state agencies to address conflicts with circular behavior, standardize definitions and reporting, or identify service or opportunity gaps (e.g., illegal dumping, construction and demolition, wood materials) SB 1383 has demonstrated what is possible through statute and regulations by expanding opportunities to manage organics, including composting, digestion, biomass conversion, and edible food recovery.	Review and refine existing policies, programs, regulations, and statutes to identify where we need to align definitions, incentives, and requirements with materials' highest and best use. Establish cross-agency materials management collaboration groups to share findings and discuss alignment, where necessary. Draft and socialize unified definitions, targets, and rules for key terminology. Work collaboratively through a cross-agency group to propose and improve how policies are carried out. Identify implications of adjustments and develop consensus-based recommendations. Submit final recommendations to relevant policymaking bodies where necessary for approval.
B2: Adopt proactive strategy for shared responsibility (new and existing) of circular materials management and responsible end market development across CalRecycle, other agencies, and local government. This pathway involves collaboration to address overlapping policies that would clarify ownership and solutions (e.g., managing agricultural materials or universal waste, repurposing wood materials,	Develop cross-agency frameworks, including new statutory requirements, as needed, for shared responsibility in managing circular materials. Where feasible, align local, state, and federal initiatives to support end-market development for circular materials.

and increasing recycled content in concrete and asphalt mixes). Successful collaborations such as **Pacific Coast Food Waste Commitment** could be a good model. Learning from interagency collaborations that work with rural and/or Tribal communities for circularity would enhance this effort. This could also expand into existing programs. For example, the State Agency Buy Recycled Campaign could broaden covered products or increase procurement of remanufactured or repairable products.	Provide tools and guidance to local governments for implementing circular strategies.
B3: Adopt statewide policies to address influx of sources of high-volume and/or valuable waste, or materials of concern. This pathway allows the development of policies to address emerging issues and materials that need solutions, such as woody biomass, products with lithium, and contamination in the organics stream. For example: • Developing a strategy for high-volume or high-value materials (e.g., energy transition materials) • Creating policies focused higher on the MMH • Collaborating with agencies managing nontraditional materials • Using innovative technologies, like biomass conversion, to create bioenergy from wood waste due to limitations of composting or digesting this material type	Identify material streams of concern through public consultation or from submittals to an online portal. Convene working sessions for each material stream to inform strategy for material management. Draft strategy for each high-priority material stream. Conduct public consultation and feedback. Finalize and adopt circular strategy for each high-priority material stream. Implement, monitor, and evaluate each strategy's impact.

Case Study

Edible Food Recovery in California

Copia is a technology company reducing food waste and combating hunger by connecting businesses with surplus food to local nonprofits. Since February 2020, Sutter Health has used Copia's platform across 16 hospitals in Northern California to divert excess hospital food to communities in need. Food service employees track surplus food and submit donations using Copia's software which dispatches drivers to deliver it to nearby nonprofits. This system optimizes purchasing decisions, reduces waste, and maximizes tax benefits for businesses. In 2023 alone, Copia helped deliver 68,600 meals from Sutter hospitals to 45 nonprofits serving food-insecure populations. These efforts saved 18.8 million gallons of water, 253,400 pounds of CO2 emissions, and 12,900 gallons of gas**.**

Copia facilitates food pickup through a streamlined logistics system, ensuring that donations are matched with nearby nonprofits, to minimize transportation time and maintain food quality. Copia has diverted over 7 million pounds of edible food from landfills through its commercial (for-profit) model. Donations were distributed to shelters, family support centers, and food recovery programs.[10]

With an estimated 1.5 million tons of donatable food sent to landfills annually in California, and 20% of Californians facing food insecurity, CalRecycle, local jurisdictions, food recovery engines, and solution providers can make edible food recovery sustainable, financially attractive, and supportive of SB 1383 compliance. Jurisdictions across the state are implementing funding mechanisms to support sustained food recovery programs. For example, some fund these programs through franchise hauler agreement fees (e.g., City of Los Angeles, Sacramento County and its cities, Glendale, Irvine, Palm Desert, and cities in West Contra Costa County). Others use an integrated waste management fee which is a per ton solid waste disposal fee, as seen in Ventura County and Alameda County and its cities (**StopWaste**). Additional funding sources are used in places like Yolo County and its cities. CalRecycle can facilitate sustainable funding for food recovery and improve compliance visibility by sharing examples of various public and private funding models.

Financial Mechanisms

Future State: Market signals and public sector funding are aligned with circular economy principles and provide a stable source of funding to accelerate California's circular economy.

Recommendations

C. Align market signals with zero waste and circular behavior.

D. Establish sustainable public sector funding that supports a circular economy.

Shifting economic incentives and investments will grow circular economy jobs, reduce material loss, and keep critical resources within the state. Funding should support opportunities higher on the MMH and disincentivize activities that lead to disposal.

Example outcomes along the MMH for the financial mechanisms recommendations include:

- **Refuse**: Fund educational programs that promote habits to use less and avoid waste
- **Rethink**: Dedicate economic development funding for companies developing circular solutions
- **Reuse:** Reduce sales tax on remanufactured products
- **Repurpose:** Provide funding options for circular businesses that repurpose materials into new items
- **Recycle:** Develop EPR programs for low-volume, hard-to-recycle products such as solar panels

Financial Mechanisms Recommendations and Pathways:

Financial Mechanisms Recommendation C:

Align market signals with zero waste and circular behavior.

Current financial systems in California and around the world often make disposal cheaper than circular solutions, putting the cost of waste reduction or diversion on jurisdictions and residents. This is due to subsidies and pricing structures that favor material extraction and energy use, externalizing environmental and human health costs. California has successfully used economic tools to promote sustainability (e.g., emissions reductions) and could apply similar strategies to align market signals and support circular economy efforts higher on the MMH, like redesign, reuse, and reduction. For example, Agromin, a large California composter, is taking an innovative approach by funding compost application on rangelands through the voluntary carbon credit market. CalRecycle and other state agencies could collaborate with stakeholders to expand this model by working with companies interested in purchasing voluntary credits. This approach would incentivize carbon farming on rangelands, significantly increasing carbon sequestration, and contributing to reducing climate pollution.

Pathways for Financial Mechanisms Recommendation C:

Three primary pathways for exploration have been identified to align market signals with zero waste and circular behavior.

First Cycle	2027-2039
Key Parties for Implementation	CalRecycle, State of California, State Agencies, Local Jurisdictions, Non-governmental/Community Based Organizations, Foundations, Federal Government, Impact Investors, Tribes, Corporate Enablers, Waste Collectors/Haulers
◆ **Pathway**	◆ **Key Actions**
C1: Review prices set by public-sector and revise as needed to incentivize circular behavior. This pathway could include: • Increasing the cost of undesirable behavior and/or decreasing the cost of zero-waste-aligned behavior • Creating EPR programs with producer fees to fund reuse and recycling • Implementing new recycled content mandates • Increasing landfill fees overall or specifically for materials with strong reuse or recycling markets • Expanding the application and amounts of grants, loans, and enforcement penalties	Conduct a study to identify effective price signals for circular behaviors. Convene a working group to facilitate pricing mechanism adjustments through public and private parties. Develop outlines/guidelines to adjust pricing mechanisms to favor circular practices. Pursue policy change for price signal adjustments. Monitor market responses and make additional changes, if needed.
C2: Support local jurisdictions in expanding circular solutions and services while minimizing rate-payer burden. This pathway would support local governments with funding and technical assistance to create cost-effective solutions like resource recovery parks, edible food recovery, repair cafes, refilleries, community composting, and lending libraries. It could take the form of: • Sharing approaches jurisdictions are using to create sustained funding—for example, the City of Los Angeles requires funding for reuse infrastructure in its new commercial franchise agreements • Advising or facilitating guidance on rate structures and contracting • Reducing regulatory costs (e.g., Environmental Impact Report, or EIR, requirements) for new infrastructure • Supporting development of regional infrastructure to alleviate local costs • Advising development of reuse infrastructure • Investing in innovative, circular services	Conduct listening sessions on local jurisdiction successes and challenges with expanding circular infrastructure and services and develop action steps. Identify public and private funding sources to create sustainable funding and develop and/or expand grant and loan programs that support local circular initiatives. Provide technical assistance for local jurisdictions in implementing circular solutions. Pursue policy change that provides additional financial support.

• Supporting access to external funding sources, loans and other financing	
C3: Support the financial viability of businesses with circular services to enable them to mature and scale. This pathway could address financial barriers faced by circular businesses through incentives and support such as: • Reducing permit costs or approval times (e.g., programmatic EIRs) • Expanding or creating new EPR programs that financially support circular business models • Prioritizing investments for disadvantaged communities • Providing access to technical resources (e.g., grant application support, GO-Biz permitting assistance) • Making progressive adjustments to tax structures (i.e., lower rates for lower incomes) to reduce labor and tax burden costs	Conduct a study of financial barriers and necessary support. Identify funding opportunities and sources and develop funding or incentive programs to reduce cost burdens. Promote partnerships between public and private sectors for financial accessibility.

Financial Mechanisms Recommendation D:

Establish sustainable public sector funding that supports a circular economy.

Value for People: Residents and small businesses save money with affordable zero-waste services and better access to reuse options.

This recommendation seeks to establish sustainable public sector funding to support California's zero-waste efforts and ensure the long-term financial viability of CalRecycle's work.

A significant portion of CalRecycle's implementation costs is funded by landfill tipping fees, but as recovery and recycling increase and disposal drops, these revenues shrink creating a funding gap that conflicts with the state's zero-waste goals. The Integrated Waste Management Account Disposal Tipping Fee has remained at $1.40 per ton since 1995, with statute prohibiting further adjustments for inflation. CARB's Short-Lived Climate Pollutant Reduction Strategy highlighted the need to adjust funding mechanisms to provide consistent financial and institutional support for CalRecycle's evolving priorities.[11] CalRecycle's 2015 report on **Landfill Tipping Fees in California** also addressed this issue, emphasizing the need for updated funding strategies to ensure sustainable waste management practices.

Other sources of state funding, beyond funds generated from the tipping fee, typically have strict limitations for use as dictated by the funding source. Funding use is also restricted to ensure focus on implementation of existing regulations. At the local level, programs and administrative costs are funded by ratepayer dollars, and these mechanisms do not often reward or incentivize waste reduction or diversion.

Pathways for Financial Mechanisms Recommendation D:

Three primary pathways for exploration have been identified to establish sustainable public sector funding that supports California's circular transition.

First Cycle	2027-2039
Key Parties for Implementation	CalRecycle, State of California, State Agencies, Local Jurisdictions, Federal Government, Impact Investors, Traditional Financial Institutions
◆ **Pathway**	◆ **Key Action**
D1: Redesign public sector funding for materials management to align with circular outcomes. This pathway involves restructuring CalRecycle's funding sources to ensure they are not solely reliant on landfill tipping fees. New financial structures should prioritize and reward activities in line with the MMH to ensure materials are turned into new products through responsible end markets.	Assess current public sector funding mechanisms and identify gaps and opportunities for adjustments. Create a framework to guide new/revised funding mechanisms for circular solutions. Develop working groups with relevant parties to identify adjustments that align funding and financial incentives with zero-waste priorities. Implement revised funding structures that prioritize zero-waste outcomes.
D2: Expand flexibility of funding use to align with circular principles. Future zero-waste legislation could direct general fund use to ensure MMH considerations are included in fund allocation. Flexibility in funding could also allow more investments that optimize community benefits, fill in gaps for overburdened communities, and prioritize disadvantaged communities. Public funds could seed private investment through tools like risk guarantees, revenue sharing, and technical support.	Review and identify gaps where public sector funding does not support circular systems (where appropriate). Identify policy changes to address gaps, fund circularity, and prioritize activities (e.g., those with responsible end markets). Adjust grant and loan criteria to provide funding for early-stage innovations and developments. Utilize existing monitoring systems to ensure funding allocations support zero-waste transitions.
D3: Integrate circular funding mechanisms into other state agencies' programs. Circular economy funding should be incorporated across all agencies responsible for materials management. By creating financial incentives within other agencies, this pathway can increase the impact of circular initiatives and develop California-based responsible end markets.	Identify opportunities for cross-agency circular funding collaboration. Pilot funding mechanisms for circular solutions. Encourage state agencies to develop and implement a materials management plan for material generated/created by their individual policies. Develop interagency coordination and oversight.

Case Study

Decoupling Revenue from Consumption

The electric utility industry offers an example of how we might design financial structures that separate revenue from consumption.

Decoupling strategies reduce or reevaluate the connection between consumption and revenue by increasing a utility's certainty of revenue and investing in lower cost efficiency initiatives with equal or greater returns compared to high-cost generation investments. Simultaneously, ratepayers are incentivized to conserve electricity with a lower fixed fee and higher usage charges.

Electric utility revenues and rates have historically been driven by consumption. Ratepayers were charged per kilowatt-hour consumed — the more electricity used, the more a utility earned. This volumetric rate and revenue structure was challenging for utilities:

- Higher financial risk: Volumetric rates result in higher volatility in revenues
- Profitability depended on consumption: Utility costs are largely driven by the fixed costs of operating facilities and infrastructure, which limit the ability to reduce operational costs. Profitability depended on increased electricity sales and electricity consumption
- Disincentivized efficiency: Energy efficiency initiatives required complex structures or financial loss from reduced consumption

A Natural Resources Defense Council analysis of five investor-owned utilities in the years following decoupling showed a 131% – 425% increase in energy efficiency investments and a 28% – 438% increase in megawatt-hour savings, reducing operating costs.[12]

Infrastructure for Circularity

Future State: California has expanded physical and non-physical infrastructure to make it easy and/or desirable to prevent materials from becoming "waste."

Recommendations:

E. Reduce challenges and increase benefits for infrastructure development and modifications.

F. Grow circular businesses and develop systems for equitable distribution of materials.

Infrastructure that aligns with activities higher on the MMH (e.g., reuse, repair, refill) will be important for zero waste. Building the needed infrastructure to transition to a circular economy will require collaboration across many groups.

Example outcomes along the MMH for the infrastructure for circularity recommendations include:

- **Refuse**: Identify retrofits that increase facility capacity and avoid new infrastructure
- **Rethink**: Invest in lending libraries tailored to community priorities in economically disadvantaged communities
- **Reuse:** Repurpose existing supply chain infrastructure to expand rescue of edible food
- **Repurpose:** Support infrastructure upgrades that maximize value through repurposing of materials
- **Recycle:** Upgrade material recovery facilities to enable more efficient, effective, and safe processing of disaster debris to recover valuable materials

Infrastructure for Circularity Recommendations and Pathways:

Value for Economy: Local governments reduce waste costs and create stable, local jobs through circular infrastructure investments.

Infrastructure for Circularity Recommendation E:

Reduce challenges and increase benefits for infrastructure development and modifications.

This recommendation is driven by the need to build more zero-waste infrastructure capacity while maintaining environmental protections through coordination between industry partners, optimization of existing infrastructure, and partnerships with existing networks to share resources and expertise.

The ambitious scope of California's 75% target and new legislation, such as the state's organic waste reduction law, SB 1383, and its packaging producer responsibility law to reduce single-use plastic and packaging waste, SB 54, highlight the need to expand existing capacity of infrastructure.2213F[13]. Today's material recovery facilities (MRFs) are not as efficient as they could be, hovering on average at 87% processing efficiency.[14] CalRecycle's grants have improved infrastructure and added processing equipment, resulting in increased diversion.

Pathways for Infrastructure for Circularity Recommendation E:

Four primary pathways for exploration have been identified to support reducing barriers for infrastructure development and modifications.

First Cycle	2027-2035
Key Parties for Implementation	CalRecycle, State Agencies, Local Government/Jurisdictions, Infrastructure Owners/Haulers, Technology Providers, Producers/Manufacturers, Raw Material Suppliers, Tribes, Intermediate Manufacturers, Secondary Manufacturers, Wholesalers/Distributors, Material Recovery Facilities, Composting/In-Vessel Digestion Businesses, Resource Management Organizations
◆ **Pathway**	◆ **Key Action**
E1: Improve timelines for permits and reduce uncertainty in the permitting process. With this pathway, timelines for getting permits, or zoning challenges with regulatory entities, could be reduced (e.g., through parallel permitting path reviews and inputs). Technical assistance in the permitting process for new or expanded infrastructure projects could reduce uncertainty.	Examine common permitting processes and challenges (e.g., time, cost, zoning) through interested party and interagency consultation. Collaborate with interested parties to develop and test solutions to identified challenges (e.g., Emission Reduction Credit funding challenges, siting challenges). Develop and implement best practices for community engagement in the permitting process, including guidance for community members. Develop and publish tools to reduce process redundancy, such as model community benefit agreements and Programmatic EIRs (e.g., current Programmatic EIR for in-vessel digestion). Provide updates to the General Plan Guidelines and provide training to planners. Train agencies and staff on new tools and processes. Provide technical assistance on new and expanded infrastructure (e.g., GO-Biz permitting assistance team). Monitor the impact on infrastructure permitting and development, and make changes as needed.
E2: Improve confidence in feedstock volumes and access to feedstock. Feedstock access could be coordinated through public-private partnership and industry collaboration, ensuring that there is reliable information on feedstock volumes and locations.	Consult with facilities and interested parties to identify regional material feedstock supply and demand. Create a strategy to connect and introduce feedstock suppliers, such as processing facilities and brokers, with reuse and recycling businesses to build out the circular economy.

This pathway will help identify the need and opportunity while de-risking the feasibility and economics of infrastructure development.	Establish feedstock logistics partnerships, including contacts to connect feedstock suppliers, project managers, and CalRecycle's data systems. Leverage existing international partners to share feedstock data and identify international supply opportunities.
E3: Increase benefits and address/mitigate negative impacts of infrastructure in local and Tribal communities. This pathway emphasizes the importance of incorporating Tribal cultural resource protections and equity considerations. Projects should minimize environmental and health impact concerns (e.g., fully enclosed, negative pressure, dust control, landscaping) and include community and economic benefits, such as improved access to circular systems, small business development, and local job creation.	Identify community benefit priorities (e.g., health outcomes, job creation). Create and deploy model Community Benefit Agreements to facilitate engagement, mitigate impacts, and deliver community benefits. Conduct Tribal consultations to improve permitting. Evaluate the cumulative impact of new and expanded infrastructure to inform future investments. Define metrics to measure community benefits. Create a playbook for engaging and incorporating community considerations. Launch Tribal consultation and community engagement initiatives, engaging in Tribal consultation early in the design process. Promote models and successful examples
E4: Optimize utilization and efficiency through retrofits, upgrades, and use of excess capacity, while reducing impacts. This pathway would efficiently leverage existing infrastructure with excess capacity to expand the capacity of circular infrastructure. Upgrading infrastructure could make it more cost-effective to source separate materials and products for reuse or repurposing (e.g., food recovery, wood reuse) or as inputs into new products. Upgrades could include technologies like AI sensors, improved robotics, or additional sorting pass/lines. Support could include: • Providing financial incentives and support, such as lower taxes, access to vacant land, permit exemptions, creative funding solutions to lower upfront costs, or absorbing material	Identify infrastructure types with underutilized or unused capacity to support zero waste (e.g., wastewater treatment facilities, rendering facilities). Create mechanisms to maximize utilization of excess capacity and pilot projects. Conduct research into infrastructure retrofit technologies and identify possible upgrades and retrofits (e.g., retooling existing construction demolition providers to offer deconstruction services). Assess potential for environmental impact mitigation and gather public input. Review permitting requirements for relevant retrofits and upgrades (e.g., at manufacturing facilities, recyclers, MRFs, etc.).

market volatility through a guarantee arrangement—the support the City of Berkeley provided to Berkeley-based Urban Ore, a reuse and salvage facility, can serve as a model for the state and other local jurisdictions • Giving technical assistance or partnership coordination to increase ease and attractiveness of infrastructure investments • Assessing and optimizing capacity (e.g. rendering facilities, anaerobic digesters) for organic waste diversion before investing in new infrastructure for the same waste streams	Identify financing and regulatory challenges for these types of projects and develop innovative solutions. Develop publicly available guidelines for retrofitting infrastructure for circular solutions, while mitigating adverse impacts. Coordinate collaborations or connections between infrastructure owners and providers of technical solutions or assistance. Showcase successful retrofits to promote adoption.

Case Study

Resource Recovery Park

Berkeley-based **Urban Ore** is a center for salvage of reusable materials from the city's transfer station. Urban Ore has a resource recovery park for processing, resale and recycling where customers can drop off reusable goods at no cost and get cash or store credit. The City of Berkeley supported the growth and success of Urban Ore by contracting with the organization to manage salvageable materials at the city's transfer station, offering a sales location lease that was rent free and subsequently charged as a percentage of income. The city helped the organization adjust zoning restrictions to allow the business to later move to a larger location. Urban Ore reported $2.7 million in sales in 2020 and created more than 30 jobs. Additionally, the nearly 900 tons of materials salvaged annually helped to offset the city's operational costs, including reducing the cost of transporting material to the landfill.

Expanding this model with pilots can provide key insights to achieve goals, divert materials from landfills, and enhance waste management safety. Scaling this model will require partnerships with municipalities, expertise in reuse, adequate warehouse capacity, and long-term contracts for stability.[15]

Infrastructure for Circularity Recommendation F:

Grow circular businesses and develop systems for equitable distribution of materials.

Circular business models that are higher on the MMH, such as reuse, resale, repair, and sharing models, are critical to source reduction efforts – reducing waste before it is generated and extending the life of products and materials.

Circular business models offer local economic benefits when compared to disposal options. Reuse and repair models are estimated to create 50 times more jobs than landfill-related employment — and more than eight times as many as recycling.[16] However, circular models often require higher start-up costs compared to waste-generating alternatives and can face challenges to grow. EPR programs like California's Responsible Textile Recovery Act can build circular systems for materials that are funded by industry.

Value for Environment: Cities and farmers cut organics disposal costs and improve soil health through expanded community composting.

Case Study

Circular Solutions for Dairy Packaging and Energy

Straus Family Creamery, a certified organic dairy in California, has a reusable packaging system to reduce waste generation. Since 1944, Straus has used reusable glass bottles with a refundable deposit to encourage returns (currently set at $3). Glass bottles are used for over 90% of milk sales, which amounts to over 2.75 million bottles returned and reused, and the equivalent number of plastic jugs avoided annually.

Straus has developed a **Sustainable Packaging Roadmap** to guide their transition to a future where all their packaging material is reused, recycled or composted. Related efforts include use of reusable pallet covers instead of shrink wrap and a 15% reduction in plastic use in yogurt and sour cream packaging.

Straus also utilizes circular solutions to generate energy. The facility's biodigester converts animal manure into methane biogas that powers the farm and charges electric vehicles.[17]

These circular efforts demonstrate the source reduction possible in the dairy industry.

Pathways for Infrastructure for Circularity Recommendation F:

Four primary pathways for exploration have been identified to spur the development and expansion of proven, equitable circular business models and distribution systems.

First Cycle	2028-2035
Key Parties for Implementation	CalRecycle, State Agencies, Local Governments/Jurisdictions, Infrastructure Owners and Haulers, Technology Providers, Reuse/Donation Centers/Food Recovery Entities, Producers/Manufacturers, Waste Collectors/Haulers, Raw Material Suppliers, Tribes, Wholesalers/Distributers, Retailers, Californians
◆ **Pathway**	◆ **Key Action**
F1: Facilitate the growth of circular services (e.g., refill/delivery, lending libraries, repair businesses, edible food recovery, secondhand clothing) that can become economically self-sustaining. Public sector funding can help develop pilot projects, such as the **Petaluma Reusable Cup Project**. This pathway should focus on accessibility for economically disadvantaged communities and individuals through reducing costs. Public engagement should be diverse and include industry and businesses, artists, local governments, and community-based organizations.	Identify circular service gaps that need support to grow/develop (e.g., lending libraries, repair cafes or businesses) and barriers to development/expansion, including accessibility concerns. Identify projects that are working and what key components were needed. Co-create financial and technical support solutions that facilitate growth of reuse/repair/refill services (e.g., grants/incentives for underserved communities). Identify relevant solution partners and build a pilot plan for solution implementation, including funding needs.

Informational and networking resources could be created to help increase adoption of maintenance, reuse, repair, and salvage systems, including leasing and rental services, that would replace single-use systems.	Identify under-utilized labor markets and other strategies to support circular infrastructure labor (e.g., individuals on social assistance, correction workforce). Provide technical assistance and financial resources to expand circular services. Create funding for pilot projects. Share and promote successful circular service support systems across communities.
F2: Invest in and accelerate adoption of systems for CRV containers that can be used multiple times. Recent bottle bill amendments authorize reusable glass containers to be included in the existing CRV system. Recycling of single-use containers occurs at a high rate but results in lost material value from uncollected containers, lost material quality/value through processing, and higher environmental impacts from material transport and processing. This pathway could include: • Providing technical assistance to help meet state standards and support growth • Coordinating the development of standard multi-use packaging • Locating financial support to establish pilot areas and grow • Replicating models such as the Canadian beer industry[18] and Latin America's universal soda bottle[19]	Identify materials and products suitable for multi-use containers through infrastructure analysis, industry engagement, and health and safety studies. Establish multi-use container and infrastructure requirements. Establish a system of technical assistance for infrastructure supporting multi-use containers. Conduct public outreach campaigns to promote adoption of multi-use containers and systems. Conduct pilot programs to test feasibility and adoption. Monitor adoption rates and adjust strategies as needed.
F3: Facilitate coordination in areas of high-volume, source-separated outflows and develop matchmaking platforms. This pathway requires CalRecycle to act as a facilitator — both for identifying potential sites for circular benefits sharing and to match those producing materials with those who need them as circular inputs. This includes: • Cataloging relevant sites with high potential for collaboration • Using data collection to identify potential materials in close proximity to production sites • Collaborating with other agencies to expand resource use and recycling in successfully established clusters Digital platforms will connect key players (e.g., recyclers, material recovery facilities, reuse	Identify and map available byproduct materials produced in large volume (e.g., wood waste, agricultural byproducts). Compile relevant sites with current or potential capacity for participation, including identifying leading practices. Establish task force(s) to explore potential resource exchange, identify needs for implementation, such as funding, and develop matchmaking strategy. Create a digital resource exchange platform or enhance existing solutions to connect material generators with users. Select and engage key facilities to participate in pilots.

centers, artists, resource management organizations) looking to exchange materials, resources, or services. They could be run by third parties and will function as matchmaking tools that facilitate collaboration and material exchanges between industries, municipalities, and other relevant actors.	Monitor and report outcomes as appropriate, including successful matches. Continuously optimize platform performance.
F4: Expand options for source reduction and diversion, and support collection and access for source-separated materials. Materials already collected by a disposal facility or recycling facility that has significant value could be rescued. The development and growth of infrastructure such as resource recovery parks, digital material matchmaking solutions, and other tools can consolidate and manage these source-separated materials. This pathway includes: • Identifying materials that could support local bioeconomies, where economic activity is derived from biotechnology and biomanufacturing from agriculture byproducts or "wastes" • Similar to recommendation E, pathway E4, direct and indirect financial support through lower taxes, access to vacant land, or permit exemptions • The development of a digital marketplace	Identify high-potential source-separated materials and identify barriers and solutions to recovery, including gaps in collection service and infrastructure expansion/development. Provide financial and technical assistance for source-separated material distribution systems. Develop partnerships with industries to enable rescue and reuse and with community organizations to increase awareness of local and regional collection and reuse/recycling options. Implement pilot programs and evaluate their feasibility, scalability, and performance through the establishment of a standardized monitoring system. Expand successful programs statewide. Launch public education campaigns to encourage participation in source-separated material programs. Adjust support mechanisms based on data and community feedback.

Case Study

South San Francisco Anaerobic Digestion Facility

Since 2014, the South San Francisco Scavenger Company (SSFSC) and Blue Line Transfer have operated a dry anaerobic digester. The fully enclosed, one-quarter-acre facility is located at Blue Line's South San Francisco site. The digester has a maximum capacity of 11,200 tons per year and processes commercial and organic materials from 20,000 households in South San Francisco, Brisbane, and Millbrae, as well as material from the San Francisco International Airport.

The biogas from the digester is collected, treated, and used as compressed renewable natural gas to power SSFSC's fleet vehicles. The facility generates between 380 to 500 diesel gallon equivalents per day of renewable natural gas. SSFSC also sells carbon credits via California's Low Carbon Fuel Standard.[20]

In 2015, the project was awarded the National Waste and Recycling Association's Recycling Equipment Innovator of the Year award, which recognizes innovation in recycling design and manufacturing to increase recycling efficiency and effectiveness.[21]

Research and Innovation

Future State: California accelerates the circular economy by becoming a leading market in attracting and growing circular innovation and innovators.

Recommendations:

G. Support research initiatives and the development, adoption, and scaling of circular solutions.

H. Increase use of circular design principles in products and business models.

Applying the state's research and innovation capabilities to the circular economy can help reach a circular transition tipping point while growing the economy for the benefit of all Californians.

Example outcomes along the MMH for the research and innovation recommendations include:

- **Refuse**: Showcase examples of research initiatives that have successfully reduced or avoided waste
- **Rethink**: Connect industry, research institutions/universities, and government to speed the transition from research to application
- **Reuse:** Accelerate reuse business model innovation by replicating reuse hubs like Urban Ore
- **Repurpose:** Support innovations that repurpose and add value to low-value, hard-to-recycle materials
- **Recycle:** Collaborate with peer agencies to pilot solutions for priority challenges such as contamination in organics

Research and Innovation Recommendations and Pathways:

Research and Innovation Recommendation G:

Support research initiatives and the development, adoption, and scaling of circular solutions.

Innovation of circular technologies has increased in recent years. These technologies span physical, digital, and biological technologies across the MMH, from refusing to create waste and redesigning waste out of our systems, to extending the useful life through reuse and repurposing, and processing materials for recycling. They improve efficiency, reduce waste, drive innovation, increase information transparency, and enable data analysis that can help identify circular opportunities and deploy circular solutions.[22] At the same time, technological innovation brings challenges. New products entering the market may lack clear paths for circular management. While the use of AI creates efficiencies, it may also lead to unintended consequences, including environmental impacts, informational inaccuracies, and security concerns.

California is home to some of the best research institutions and leading businesses in the world that are interested in developing new insights and solutions. There are university-based research initiatives with both specific and broad applications. This recommendation encourages broad knowledge sharing to increase adoption of circular behaviors and technologies.

Case Study

Circular Bioeconomy Hub

The Beam Initiative, led by **BEAM Circular**, a nonprofit in California's North San Joaquin Valley (NSJV), transforms waste in underserved agricultural regions into economic and environmental solutions. Serving as a hub for the circular bioeconomy, the portfolio's anchor project is a bioindustrial manufacturing testbed facility and innovation campus, which will support the scale-up of technologies that convert agricultural products like

nut shells, food scraps, and livestock waste into valuable products such as building materials, renewable energy, and consumer goods. By driving public-private projects that align with community priorities and industry needs, BEAM Circular accelerates innovations in bio-based products, creating a supportive ecosystem for sustainable biomanufacturing and positioning the NSJV as a regional leader in this field. Recent successes led to a 10-year, $30 million venture capital funding commitment for circular bioeconomy start-ups in the North San Joaquin Valley.

Pathways for Research and Innovation Recommendation G:

Four primary pathways for exploration have been identified to support the adoption and scaling of circular innovation and learnings.

Value for Economy: Circular economy startups access financing more easily, reducing barriers to growth.

First Cycle	2027-2031
Key Parties for Implementation	CalRecycle, Educational/Research Institutions, Circular Solution/Technology Providers, Raw Material Suppliers, Corporate Enablers, Secondary Manufacturers, Tribes, Producers/Manufacturers, Wholesalers/Distributors, Retailers, Waste Collectors/Haulers, Material Recovery Facilities, Reuse/Donation Centers/Food Recovery Entities, Composting/In-Vessel Digestion Businesses, Educational/Research Institutions, Resource Management Organizations, Federal Government
◆ **Pathway**	◆ **Key Action**
G1: Establish an innovation roadmap to guide areas for investment, establish standards for consistent designing, testing, and solution validation, and support subsequent scaling through funding and financing solutions. This pathway reviews the successes and learnings from internal and external programs to create a document with a standard innovation approach into a custom playbook that considers CalRecycle's role and funding requirements. Existing and new sources of funding and financing will be utilized to support circular innovation projects, both within CalRecycle and among external parties. There are many examples of municipal and corporate innovation approaches for circularity, such as the **World Economic Forum Scale 360 Circular Innovation Playbook**.	Identify key areas for innovation and define innovation approaches with interested parties. Develop a roadmap of steps for each stage of innovation, establishing KPI. Conduct a review of international innovation frameworks and incorporate them into the roadmap. Identify sustainable funding sources. Outreach to investors and grant-making organizations to partner and connect to external sources. Identify gaps between funding (both internal and external) and solutions, factoring in highest and best use on the MMH. Seek authority and dedicated funding to finance innovative circular solutions. Co-create funding structure options for startups, small businesses, and funders/financial institutions.

Additional details on funding and financing pathways are included in the financial mechanisms recommendations.	Prioritize research and innovation approaches and investments that benefit underserved and overburdened communities to advance equity. Support early-stage projects with State Treasurer's Office funding, CalRecycle loans/grants, or existing collaborations with GO-Biz. Using the roadmap and gap analysis, develop investment plans for new programs and opportunities, adjust existing programs, and support market development and outreach to solution providers. Monitor utilization and outcomes of funding mechanisms by conducting benefits analysis and tracking KPI.
G2: Showcase successful circular solutions from CalRecycle programs and beyond that can be broadly applied to improve existing efforts and inspire new programs. This pathway shares success stories via CalRecycle channels, including the website, social media, and virtual or in-person workshops (with additional formats to be determined), as well as broader media outreach, to raise awareness of the circular transition and CalRecycle's role in it. These stories may include lessons from educational programs focused on redesign, reuse startups, and pilot programs addressing recycling challenges posed by new products. Documenting case studies will inspire further innovation and adoption of circular economy principles and technologies. Two examples are the **California Energy Commission's Energize Innovation Project Showcase** and Ellen MacArthur Foundation's **CE100 list.**	Identify and document successful circular economy projects in California. Develop a case study repository to highlight best practices and outcomes. Share case studies through digital platforms, proactive media outreach, and interested party events and conferences. Identify common themes of success and encourage replication of successful models across sectors.
G3: Identify, consolidate, and publish key research interests. This pathway involves CalRecycle helping share research by partnering with the networks developed by its staff and existing programs, including EPR programs such as mattresses and carpet, which have funded research in priority topics. By listing high-priority research topics and publicizing that list, CalRecycle can guide research centers and beyond. AI could be used to monitor	Conduct outreach to value chain representatives to identify key research needs (e.g., reusable container system innovation, availability of material market data, recycling of wood, asphalt, concrete, and aggregate materials). Create guidelines for vetting external research. Review academic and private sector research underway to identify gaps and opportunities. Publish a repository of consolidated findings.

and find additional research, with results being vetted for quality and relevance. One example of crowdsourcing for key sustainability challenges is **World Economic Forum's Uplink Innovation Network**. To date, UpLink has had over 7,700 solutions submitted worldwide through its platform across more than 65 innovation challenges.	Develop a list of research needs to share with collaborators/research institutions.
G4: Facilitate coordination between entities developing solutions and parties interested in piloting, testing, or supporting solution development. This pathway consists of CalRecycle actively facilitating connections between researchers and those who may be interested in testing or scaling their findings. This process would tap into existing innovations, laboratories, programs, and networks to expand circularity through a connection to other value chain players. Current connections require individual attention and coordination, with special consideration to ensure CalRecycle is not endorsing a specific technology or entity. Additional opportunities for scaled connections are included in the data and monitoring recommendation K. Examples include: • CalRecycle's various EPR programs have developed networks of experts in circular innovations that could help support this pathway • Universities and colleges serve as hubs for innovation and research • Healthcare facilities offer research opportunities that could be examined in large closed-loop systems	Create a database of entities developing circular economy solutions (e.g., a California-specific version of the **Circular Startup Index**) in partnership with interested parties. Establish a matchmaking mechanism for connecting solution developers with potential partners. Host or sponsor networking events to foster collaboration (e.g., tabling at relevant workshops). Work with a startup incubator or host to showcase relevant research to the public. Prioritize and conduct pilot projects in disadvantaged communities, addressing economic gaps that discourage innovation. Assess the impact of facilitated partnerships through self-reported outcomes.

Research and Innovation Recommendation H:

Increase use of circular design principles in products and business models.

Value for Economy: Manufacturers save on manufacturing costs by designing products that prioritize source reduction.

A product's expected environmental impact is determined during the design stage. Designing out waste from systems and products is at the top of the MMH and a crucial component of achieving zero waste. According to

the Ellen MacArthur Foundation (EMF), design choices will account for 80% of a product's environmental impact.[23] Universities can serve as innovation labs, testing circular materials, reuse ideas, and business models. California Native American Tribes can be partners in developing and piloting innovative approaches to circularity that integrate traditional ecological knowledge.

Through EPR programs and other initiatives, there is increased industry engagement, creating opportunities for manufacturers to focus on designing for reuse, repair, and recyclability. For example, the **Mattress Recycling Council** (MRC), the stewardship organization that operates the mattress EPR programs, invests nearly $1 million a year in research to develop efficiencies in mattress collection, transportation, and deconstruction activities, as well as developing new uses for recycled mattress materials.

Case Study

California's Paint Stewardship Program (EPR)

Launched in 2012, California's Paint Stewardship Program manages leftover paint through a comprehensive recycling system. On behalf of CalRecycle, the nonprofit PaintCare manages the program, which includes year-round drop-off sites that are searchable on the **PaintCare website.** Additionally, PaintCare identifies reuse locations that provide good-quality leftover paint to the public at low or no cost. To encourage reuse, PaintCare compensates paint drop-off sites that operate reuse programs under a contract with PaintCare. Since its inception, the program has achieved impressive results, exemplifying the effectiveness of EPR initiatives in reducing waste.

As of 2023, the paint stewardship program ensured that 99.1% of Californians live within 15 miles of one of 875 drop-off sites across the state**.** That year, PaintCare processed 3,317,702 gallons of paint, with 88% being reused or recycled**.** In total, the program has collected 35.7 million gallons of paint and recycled 2,002 tons of paint cans. In 2024, the program expanded to accept a greater range of paint products, an initiative other EPRs could consider to increase their impact. Applying findings from this program to other product EPRs can accelerate California's progress towards a circular economy.[24]

Pathways for Research and Innovation Recommendation H:

Three primary pathways for exploration have been identified to facilitate research initiatives to accelerate innovation in circular product and business model design.

First Cycle	2028-2034
Key Parties for Implementation	CalRecycle, State Agencies, Federal Government, Educational/Research Institutions, Producers/Manufacturers, Secondary Manufacturers, Corporate Enablers, Circular Solution/Technology Providers
◆ **Pathway**	◆ **Key Action**
H1: Establish innovation hubs and incubators focused on circular solutions and design to support startups and research institutions. This pathway would establish or expand innovation hubs working on the circular economy to attract and support companies developing zero-waste products. Incubators bring workforce, capital, and	Conduct a scan of successful existing circular design hubs and incubators for key elements and create a repository of leading practices. Identify existing hubs, such as the Los Angeles Cleantech Incubator's textiles program and BEAM Circular's bio-industrial manufacturing campus, and evaluate their focus areas, resources, and impact.

knowledge to the local economy and nearly double the survival rate of businesses.	Identify strategic partners for innovation hubs. Conduct a search for hub operator(s) (e.g., school districts and universities, startup accelerators, healthcare systems, NGOs). Draft an operational plan for hub(s) to support startups and researchers. Support the launch of hub(s) with expertise and networking opportunities. Track innovation outcomes to ensure return on investment (e.g., job creation, small and medium businesses launched).
H2: Develop principles for incentivizing or requiring circular design innovation. Other regions, such as the European Union (EU), have adopted **sustainable product design standards** that include circular indicators. This pathway is focused on CalRecycle adapting or creating its own set of guidelines to inform products that are made in California. CalRecycle may want to initially focus on materials with particularly high volumes. This could include establishing standards for refillable packaging and including design for reuse in EPR programs.	Identify California's priority products for circular design principles. Engage with industry leaders to work on circular design principles (e.g., **Consumer Good Forum's Golden Design Rules**) or an EPR framework in line with relevant statutes. Develop incentives to promote adoption of circular design principles among packagers/producers (e.g., material subsidies, recognition programs). Launch a time-bound challenge or pilot program to promote circular design approaches. Evaluate the pilot outcomes and refine principles for broader adoption.
H3: Support transition to zero-waste operations for key sites to model circular economy opportunities and influence zero-waste behaviors. This pathway consists of CalRecycle connecting with sites that are already integrating zero waste and circular economy into their strategies to understand their successes and challenges. CalRecycle could also offer capacity-building support to those who are earlier in their journey to zero waste. This could include: • Identifying closed-loop systems like universities, colleges, and healthcare systems that can implement zero waste with a high likelihood of success and knowledge transfer • Engaging event organizers and facilities preparing to host the LA 2028 Summer Olympic Games, 2026 World Cup competitions, or other large-scale events • Working in partnership with Tribes to incorporate Tribal priorities, apply traditional	Select sites and engage partners to serve as models of circular value and feasibility. Provide technical assistance and training to conduct facility waste audits and resource assessments. Develop customized zero-waste plans that incorporate capacity building. Implement and monitor zero-waste plans including engagement and communication. Highlight and share success stories. Develop plan for implementation at more sites, including identifying whether legislation or funding is needed.

ecological knowledge, address challenges unique to Tribes, and support knowledge sharing with other Tribes • Partnering with existing networks that already are doing this work. For example, the California Resource and Recovery Association, Zero Waste Campus Council, or entities that hold a TRUE certification from Green Business Certification Inc.	

Case Study

Innovative Beverage Container Redemption

Sacramento County partnered with California RVM Solutions, also known as **Simply Recycle**, to implement the Sacramento County Pilot Project. Simply Recycle was awarded $1.5 million through CalRecycle's Redemption Pilot Project Grant Program. Simply Recycle's clean loop redemption center serves as an innovative approach to beverage container redemption.

Currently, customers have the option to redeem their beverage containers through bulk feed reverse vending machines (RVM). Customers will eventually have access to a bag drop option, which will further increase recycling opportunities. Each redemption technology can print a voucher for immediate cash payment or electronic payment options via an application. The array of technology provided at the center allows customers to redeem mixed beverage containers at once instead of sorting by material type.

Since first opening in November 2024, Simply Recycle has redeemed and recycled over 944,000 containers at its new facility. Simply Recycle was awarded Sacramento County's 2025 Sustainable Business Award in September of 2025.

Communication for Cultural and Behavioral Change

Future State: Individuals, businesses, organizations, governments, and other interested parties understand how and what they can do to participate in the circular economy and where to access the resources to help.

Recommendations:

I. Develop tailored communication and education campaigns based on research of Californians' behaviors, beliefs, needs, and interests.

J. Make it easier to find and use tools and resources for zero waste.

Studies indicate that knowledge and awareness can impact recycling behavior.[25] While most individuals self-report knowing how and what to recycle, field testing has shown mistakes due to outdated information or gaps in understanding.

Example outcomes along the MMH for the communication for cultural and behavioral change recommendations include:

- **Refuse**: Compile and share educational resources and practices to encourage waste avoidance
- **Rethink**: Develop an industry-specific campaign for redesigned low- or no-waste commercial packaging and transportation
- **Reuse:** Offer business-tailored information on available reuse solutions
- **Repurpose:** Provide training on simple but effective repurpose solutions
- **Recycle:** Use historical data on missorted recyclables to communicate behavior change opportunities by household or neighborhood

Communication for Cultural and Behavioral Change Recommendations and Pathways:

Communication for Cultural and Behavioral Change Recommendation I:

Develop tailored communication and education campaigns based on research of Californians' behaviors, beliefs, needs, and interests.

Behavior change is a critical component of achieving zero waste, particularly higher up on the MMH before waste is generated. California's circular transition will require a cultural shift from disposable lifestyles to purchasing more circular products and services, repairing and repurposing products, and improving recycling behaviors.

CalRecycle provides education and engagement through its website**, virtual and in-person meeting series**, and **social media presence**. The **I Recycle Smart** campaign and **Recycling Reimagined** campaign both encouraged specific recycling behaviors. CalRecycle partnered with Grades of Green to support the Recycling Reimagined campaign by training high school and college student leaders to serve as the digital voices of a youth-led recycling movement. By leveraging student voices and representation from diverse California regions, the Student Social Media Ambassador Program (SSMAP) delivers culturally relevant, regionally accurate messaging that shifts attitudes and inspires behavioral change while investing in youth environmental leadership development. These examples can serve as the foundation for broader communications on zero waste and a circular economy through resources and education.

Action on this recommendation should be aligned with existing requirements (e.g., SB 1383, SB 54, EPR programs), be science-based, embrace innovation, and result in clear, standardized messaging and tools that

can be used by interested parties such as local jurisdictions, haulers, schools, faith groups, and community-based organizations. Partnerships with interested parties experienced in driving cultural and behavioral change on zero waste and circularity (e.g., trade associations, non-governmental organizations, research institutions) can offer valuable insights to inform new research.

Pathways for Communication for Cultural and Behavioral Change Recommendation I:

Five primary pathways for exploration have been identified to develop communication and education campaigns based on Californians' behavior patterns, needs, and interests to enable a human-centered circular transition.

First Cycle	2028-2031
Key Parties for Implementation	CalRecycle, State Agencies, Local Jurisdictions, Waste Collectors/Haulers, Community Groups, Tribes, Non-governmental Organizations, Community Based Organizations, Educational/Research Institutions, Producer Responsibility Organizations, Californians
◆ **Pathway**	◆ **Key Action**
I1: Conduct research to understand geographic and demographic patterns and differences in consumption, behavior change motivators/interests, zero-waste challenges, and trusted mediums and sources for information. Different audiences value different benefits and understanding what matters most to them will help create effective outreach efforts on zero waste.[26] Research, in partnership with research institutions and other relevant organizations, would provide valuable insight. Research questions could include: What do current behaviors look like and what is the sentiment on zero waste? Who finds zero-waste actions frustrating and difficult and why? Who are the zero-waste champions? Engagement efforts should be broad to encompass all ages and community groups, and extend beyond residential engagement to include businesses, brands, and other industry representatives.	Identify potential partners and align on desired scope of initial research including research plan. Analyze research to develop insights on individual behaviors, consumption, and challenges, and identify trends in community groups. Identify motivators, trusted information mediums by population groups, and common values (e.g., decreased wildfires). Assess regional and demographic differences and similarities of insights. Use findings to build personas and share research with interested parties and relevant local communities.
I2: Establish a baseline of Californians' familiarity with circular and zero-waste topics and actions. Using the research findings from the preceding pathway, CalRecycle can analyze and test whether Californians may already practice zero-waste behaviors and whether they identify those behaviors as zero waste. This will be important to	Identify potential supplemental research tools (e.g., focus groups, sentiment analysis). Combine existing and supplemental research to assess awareness and understanding of circular economy principles.

ensure messaging is simple and understandable, which is critical for influencing behavior.[27] Not all Californians will be motivated by societal or environmental sustainability benefits. However, there are other motivators that drive sustainable behavior. If sustainability can become relevant to someone, they can change behavior, as found in the **Our Human Moment** report.	Benchmark Californians' current-state engagement with zero-waste behaviors (e.g., composting, reuse program participation). Use benchmark findings to inform action plans. Share benchmark findings and localized data with local communities.
I3: Define target actions for each audience, factoring in key geographic and demographic trends identified through research, including digital engagement data on social media, search engines and increasingly AI platforms. This pathway is an important step to encourage zero-waste behaviors. CalRecycle can work with research/digital media contractors to identify words, images, and strategies that engage behaviors by region and demographics to determine key messages and behavior change objectives. This includes outreach for all interested parties (e.g., school districts, residents, community groups, industry groups, resource management organizations, and businesses).	Conduct geographic and demographic analysis on existing or new research to determine audience-specific trends. Identify barriers and motivators for circular behavior within each audience group. Define targeted zero-waste actions by audience segments based on findings. Monitor actions to ensure relevance across time.
I4: Develop messages that motivate action by emotionally connecting to what personally matters most to an audience group demographic. This pathway takes existing research that uses psychological insights (such as attitudes, values, and behaviors) to understand how different groups engage with sustainability and zero waste and creates new campaigns and messages. Behavior and motivations vary by demographics, attitudes, values, and lifestyles, so messaging must go beyond a one-size-fits-all approach and apply best practices for language access.[28]	Design messages that emphasize audience-specific benefits of circular behaviors. Collaborate with local interested parties to ensure message relevance. Test and refine messages through small-scale campaigns.
I5: Align communication channels and messengers to best reach the target audience, including digital tools for different ages and skill levels. This pathway identifies the best and most appropriate communication channels and potential ambassadors, such as community groups, by evaluating research findings. This includes: • Understanding who/what are considered trusted messengers and meeting the target audience "where they are at" • Factoring in different languages, including for print and media	Compile data on existing communications channels (e.g., email, social media). Identify the most effective communication channels for each audience group (e.g., for youth, place-based learning and experiences). Identify the most effective digital tools for each audience group (e.g., for youth, online apps and games that engage and educate). Select the most credible messengers for each audience group.

• Adding targeted messaging in existing communications from schools, local communities, nonprofits, industry, etc. • Building a robust educational program that uses evolving AI abilities to create effective digital tools like infotainment • Using community-based organizations as trusted messengers to address equity concerns • Working with school districts to incorporate messaging into programs and curriculum	Share resources and campaign materials with interested parties, such as local governments, community groups, and faith-based groups that can help amplify the message. Implement campaigns using selected channels in collaboration with interested parties and track their performance.

Communication for Cultural and Behavioral Change Recommendation J:

Make it easier to find and use tools and resources for zero waste.

Resources to engage in sustainable behavior have become widely available in recent years. How-to guides and detailed guidance on accessing recycling programs in California are offered by nonprofits, local jurisdictions, educational institutions, and haulers to name a few — in addition to CalRecycle's own resources.

Public awareness of the circular economy as a concept is also on the rise. Californians make use of circular business models and products through reuse, resale, or recycle programs on a daily basis. A recent study found that 60% of U.S. consumers agree that "shopping secondhand…gives them the most bang for their buck," signaling increased awareness.[29]

CalRecycle's website and social media channels provide detailed information for both the general public and businesses across the value chain. Making resources and tools easier to find and use will help Californians support circular economy and zero-waste efforts. To keep up with fast-changing AI technology, the state needs strong systems and funding for integrated, accessible tools.

Pathways for Communication for Cultural and Behavioral Change Recommendation J:

Three primary pathways for exploration have been identified to improve visibility and usability of circular resources and tools.

First Cycle	2027-2031
Key Parties for Implementation	CalRecycle, Local Jurisdictions, Waste Collectors/Haulers, Non-governmental Organizations, Community Based Organizations, Producer Responsibility Organizations
◆ **Pathway**	◆ **Key Action**
J1: Consolidate local and statewide resources and tools to be easier to find and use. This pathway could create a public directory with reputable sources on recycling facilities, local recycling requirements, zero-waste actions, and circular alternatives, etc. If resources are limited, it could initially focus on the most effective resources and actions higher on the MMH. This would require coordination with partners such as nonprofits, research organizations, jurisdictions,	Analyze existing resources and tools (e.g., recycling guides, zero-waste focused mobile applications, construction and demolition recycling locations) to identify gaps in the use and usefulness of waste reduction tools. Identify intuitive access points for tools and resources (e.g., unified platform). Optimize tools for accessibility and ease of use, including mobile compatibility.

resource management organizations, schools/universities, and businesses to add specific tools and information such as AI resources and available circular services and facilities. It could also involve working with AI chat platforms to ensure that reputable resources and messengers are prioritized over other information.	
J2: Develop additional resources and tools for awareness and utilization based on need determined, including for businesses and school-aged children, via market research. The market research and directory from previous pathways could help design a strategy for new resources (e.g., toolkits, curriculum, etc.). This could include educational resources and targeted messaging for specific audiences.	Review research to identify unmet needs for circularity (e.g., region-specific guides where recycling rates are lower, limited instruction on recycling a material, waste industry training, training on construction and demolition reuse and recycling). Prioritize and develop new resources that address gaps in collaboration with interested parties. Launch new tools with targeted campaigns to drive adoption. Assess the effectiveness of new resources.
J3: Provide education, resources, training, certification, grants, and technical assistance to local jurisdictions, schools, Tribes, non-governmental organizations, and businesses. To support local governments, businesses, resource management organizations, and other interested parties, this pathway would provide resources and other support. Technical assistance could be modeled after existing efforts. For example, the Municipal Assistance Coordinators (MAC) in Massachusetts provide technical assistance to local jurisdictions. Resources for school districts could include innovative or targeted approaches (e.g., teaching sustainability through art, or training for facilities management and administrators). Resources for businesses could clarify what they can do to help achieve zero waste and circularity and emphasize financial benefits to increase participation in zero-waste activities (e.g., reducing tax burden with edible food recovery participation). Resources for working professionals could be tailored to specific needs on zero waste (e.g., healthcare industry, solid waste industry, engineers, manufacturers/brands).	Review successful technical assistance programs to model best practices (e.g., Massachusetts MAC program, Colorado Circular Communities Enterprise). In collaboration with local jurisdictions and businesses, determine priority needs to support circular innovation and learning. Develop tools, templates, and other support materials based on consultation. Share technical assistance resources through a local government listserv, the CalRecycle website, other State of California websites, and targeted communications.

Cross-Cutting Foundations

Three categories support and enable the implementation of the strategic pillars in the Plan. These categories are called cross-cutting foundations, and include: data and monitoring, community engagement and capacity building, and partnerships. They are supporting categories that enable the implementation across all strategic pillars.

The Plan includes recommendations for improvements in the cross-cutting foundations to better support a transition to a circular economy.

Cross Cutting: Data and Monitoring

Future State: California has a more complete picture of what and how materials are produced, used, and managed to facilitate circular opportunity identification and performance tracking across all avenues for circular materials management.

Cross-Cutting Recommendations:

K. Expand and standardize data visibility across material types and management pathways through open and crowdsourced data.

L. Improve and expand data analysis to inform new solutions and refine existing systems.

The following recommendations will enable California to significantly enhance its data and monitoring capabilities and gain a clearer picture of how materials are produced, used, and managed. This will make it possible to identify source reduction opportunities and track progress and impacts across various programs.

Data and monitoring example outcomes along the MMH include:

- **Refuse**: Update and revise the material generation calculation to account for source reduction
- **Rethink**: Track perishable material flows to identify supply chain challenges leading to food spoilage
- **Reuse:** Develop material markets to facilitate material matching and increase access for reuse
- **Repurpose:** Track and highlight successful repurposing efforts
- **Recycle:** Increase visibility into self-haul and other materials that should be redirected to recycling

Data and Monitoring Recommendations and Pathways:

Cross-Cutting: Data and Monitoring Recommendation K:

Expand and standardize data visibility across material types and management pathways through open and crowdsourced data.

Currently, there is an incomplete view of material flows due to reporting exemptions for certain waste generators, such as self-haulers, and certain materials, such as MRF residues and contamination. These gaps limit the usability of metrics, while generation and consumption data gaps limit accurate data analysis.

CalRecycle is building a single enterprise data solution that will facilitate data visibility across material types, improve ease of data entry/collection, and offer standardization. New and expanded EPR programs like SB 54 will provide more producer data on generation.

New data should also support tracking of any negative impacts to better understand lifecycle costs for materials management solutions and to help protect our communities.

Case Study

AI Contamination Detection

Prairie Robotics leverages machine learning and AI to enhance recycling efficiency by equipping collection trucks with cameras, GPS, and AI-enabled computers. The company's technology automatically detects recycling contaminants and generates tailored educational materials for households. This approach allows administrators to access real-time data to monitor improvements and identify trends. Through such innovations

and strategic partnerships, Michigan has created 72,000 jobs in the recycling, reuse, and remanufacturing sectors, and the recycling rate in East Lansing has increased from 14% in 2019 to 21% in 2023.[30]

Pathways for Data and Monitoring Recommendation K:

Four primary pathways for exploration have been identified to expand and standardize material flow data visibility across material types and management pathways.

First Cycle	2028-2034
Key Parties for Implementation	CalRecycle, State Agencies, Local Jurisdictions, Tribes, Raw Material Suppliers, Producers/Manufacturers, Composting/In-Vessel Digestion Businesses, MRFs, Wholesalers/Distributers, Retailers, Intermediate Manufacturers, Nonprofits/Community Based Organizations, Waste Collectors/Haulers, Reuse/Donation Centers/Food Recovery Entitites, Educational/Research Institutions, Resource Management Organizations
◆ **Pathway**	◆ **Key Action**
K1: Integrate existing data from cross-agencies, local governments, NGOs, and public and commercial sources, into an online platform accessible to all users. This pathway could include diverse data sources and materials such as CalRecycle data, jurisdiction data, Caltrans litter studies, illegal dumping, stormwater, procurement, construction and demolition facilities, and imports/exports, to provide a holistic view of material flows that is accessible to many groups, including local governments, businesses, researchers, and nonprofits. A standardized format will result in comparisons for better alignment between state, local, and commercial efforts to find barriers and patterns and to enhance overall decision-making. Accessible, easily integrated data can increase the number of interested parties working to identify circular opportunities, foster innovation, and promote resource-sharing across sectors. Other dashboards like the California Health and Human Services Open Data Initiative and the California School Dashboard have integrated cross-agency data to improve tracking and performance.	Establish criteria for including external data into state data and co-create data format standards to improve data useability. Explore existing Open Data solutions for integration and use. If an existing Open Data solution is not used, launch a secure, accessible Open Data platform. Translate relevant, existing state data to align with co-created format standards. Standardize and update key datasets to address current and anticipated changes while enabling multi-year comparisons. Establish agreements and a centralized repository for data sharing. Train interested parties on data protocols. Develop mechanisms for easy integration with other tools (e.g., editable data files). Continuously improve the solution and expand the available data based on feedback.

K2: Expand data collection through voluntary disclosure (including crowdsourced data) and, when necessary, additional required reporting. By encouraging industry to voluntarily share data with this pathway, California can broaden its dataset, particularly for materials that are difficult to track or emerging. Where feasible and appropriate, safeguards should be added to protect voluntary data disclosures. Crowdsourced data can complement traditional data by providing timely, granular insights. This could include identification of circular businesses and community science-based initiatives. Although some data gaps can be addressed through voluntary reporting, existing data, and third-party analysis, there are still data gaps on what is collected, who provides it, and how it can be used, largely due to differences in self-reporting. Expanding who reports data and what they report will help track material flows and metrics. Mandatory data reporting should include specific and detailed requirements to ensure accurate, meaningful data. It could include data from MRFs (such as residuals, contamination, and unsold sorted materials) self-haulers, and jurisdictions (such as provided services and participation rates).	Determine priority areas, gaps, and details needed from data. Explore existing crowdsourced data and related initiatives that could address gaps. Explore data gaps best addressed through required reporting. Identify potential regulatory/statutory updates to close gaps where necessary. Create incentives and user-friendly platforms for voluntary disclosure and new public data contributions. Establish protocol for reporting fields and process, and for confirming voluntary data is representative. Conduct training with relevant entities for any newly required reporting. Engage interested private-sector parties to increase voluntary participation. Use insights to prioritize and inform zero-waste decisions. Monitor and showcase the impact of voluntary data. Support compliance of required reporting through audits, additional training, and continued process improvements.
K3: Conduct material characterization studies to estimate consumption and material flows beyond reported data. Current material generation estimates rely on outdated consumption data from 1990 to 2010, which are adjusted only for population growth. Current material characterization studies are limited to disposal data, which does not address all materials generated across California. This pathway calls for a detailed material characterization study to improve accuracy, reflect current consumption patterns, and capture unreported material flows. Updated data would help identify gaps and opportunities, especially in environmentally burdened or economically disadvantaged communities.	Prioritize materials/regions for characterization (e.g., on basis of material volume). Identify potential local organizations or jurisdictions looking to complete similar studies to consider merging of studies or collaboration. Develop custom methodologies for conducting characterization. Identify collaboration opportunities along the value chain for conducting characterization (e.g., Producer Responsibility Organizations (PROs), academia). Compile findings to increase shared understanding of material flows. Communicate results to interested parties.

Cross-Cutting: Data and Monitoring Recommendation L:

Improve and expand data analysis and monitoring to inform new solutions and refine existing systems.

This recommendation would make data analysis faster and more comprehensive. By analyzing zero-waste performance and gaps, CalRecycle can identify circular economy opportunities and make near real-time, data-informed changes. Analysis can also offer localized insights and performance comparisons to guide implementation changes or investments, uncover areas that need targeted technical assistance, and help direct compliance outreach and enforcement actions.

Currently, data analysis is time-intensive due to challenges and gaps identified in recommendation K and is primarily focused on evaluating the performance of existing programs, which mostly focus on end-of-life recycling. This narrow data analysis limits the state's ability to establish a baseline for material generation or conduct trend analyses.

Case Study

Chumash Casino Resort

Since 2004, Chumash Casino Resort in Santa Ynez, CA, **has achieved a 90% waste diversion rate by revamping its waste management system**. The resort aimed for net zero waste by 2019 through innovative methods and partnerships, including food waste recycling and specialty recycling for hard-to-recycle items. They also created a dedicated custodial technician role and a Chumash Green Team. From 2008 to 2024, waste generation was cut by 45% while visitor numbers increased. Additionally, the resort processes 2,700 pounds of organic waste into 700 pounds of compost every 24-36 hours using an on-site in-vessel digester.[31]

Installing a composter provides numerous advantages, such as saving money on labor and transportation costs. Through their commitment to zero waste, the Santa Ynez Band of Chumash Indians established a model that they hope will inspire others to take similar actions to benefit the environment.

Pathways for Data and Monitoring Recommendation L:

Four primary pathways for exploration have been identified to improve and expand data analysis and monitoring to inform new solutions and improvements on current systems.

First Cycle	2027-2030
Key Parties for Implementation	CalRecycle, Elected Officials, State Agencies, Tribes, Raw Material Suppliers, Producers/Manufacturers, Wholesalers/Distributers, Retailers, Intermediate Manufacturers, Nonprofits/Community Based Organizations, Educational/Research Institutions
◆ **Pathway**	◆ **Key Action**
L1: Establish a baseline to measure progress for reduction/reuse/remanufacturing, and revise and	Define benchmarks and aggregate historical data, focusing on data gaps (e.g., source reduction, reuse, remanufacturing).

expand all performance metrics to enable comparisons and shared learning. Performance metrics currently rely on outdated estimates. This pathway creates an updated generation baseline and methodology that adjusts for changes in consumption and includes activities that are higher on the MMH. Modeling and projections using outside data can help fill in gaps where direct data isn't available.	Periodically assess and revise current or new metrics, baselines, and calculations. Monitor key indicators and publish progress reports. Train interested parties on applying new and revised metrics where relevant.
L2: Expand data analysis to focus on identifying material priority areas and circularity opportunities. This pathway will help identify locations and material types that are ready for upstream interventions. AI is an emerging tool that can assist data collection analysis, especially with large amounts of data. However, it would be wise to de-risk AI implementation before using it widely.	Analyze data to identify material management inefficiencies, opportunities, and priority areas. Collaborate with interested parties to understand and develop a plan to address priority areas. Use findings from collaboration to guide policy and funding.
L3: Proactively monitor emerging materials of concern. Some examples of priority materials could include microplastics, per- and polyfluoroalkyl substances (PFAS), and wood waste. While important, Material Characterization Studies have significant lags between studies that limit their ability to understand disposal, including for products with longer lifespans. Monitoring new materials in the waste stream is essential to stay ahead of challenges and create programs or policies that address changes in material use before they become problems.	Establish systems to track and assess emerging materials. Collaborate on risk mitigation strategies with interested parties. Create adaptive policies to address emerging trends.
L4: Monitor the additional impacts of supporting a circular economy. Expanding circular solutions and services in a local community will support a circular economy and result in related benefits. However, to better assess the impacts of these efforts, they should be tracked and monitored.	Collaborate with interested parties to create a list of impacts to monitor (e.g., community benefits, unintended consequences). Develop monitoring systems to track and assess impact. Make recommendations or changes as appropriate and necessary.

Cross Cutting: Community Engagement and Capacity Building

Future State: Californians are empowered to guide and participate in the state's circular transition for all.

Cross-Cutting Recommendations:

M. Foster open dialogue with community members to integrate continuous and inclusive input from all voices.

N. Proactively engage and support capacity building for Tribal, rural, and environmentally burdened communities to participate in California's circular transition.

Community engagement and capacity building are best practices in zero-waste planning. They help gather input, shape strategies, and scale solutions to meet local community needs and prevent adverse impacts.

Example outcomes along the MMH for the community engagement and capacity building recommendations include:

- **Refuse:** Consult with Tribal enterprises to share procurement strategies and technology solutions that reduce food waste and costs from over purchasing
- **Rethink:** Work with community members to help to improve the efficiency and scale of edible food recovery systems, reaching families in need
- **Reuse:** Support the expansion of repair and reuse systems that address community needs by working with community-based organizations
- **Repurpose:** Collaborate with local communities in co-creating new uses for decommissioned waste infrastructure
- **Recycle:** Engage youth leaders to understand and help address perceived local composting barriers in their communities

Community Engagement and Capacity Building Recommendations and Pathways:

Cross-Cutting: Community Engagement and Capacity Building Recommendation M:

Foster open dialogue with community members to integrate continuous and inclusive input from all voices.

CalRecycle offers meaningful opportunities to provide input including monthly public meetings, needs assessments, workshops, and listening sessions. CalRecycle leverages multiple listservs with over 30,000 unique emails for outreach and engagement. The Office of Environmental Justice, Tribal Relations, Education and Outreach facilitates community engagement and Tribal consultation to inform the development of policies and programs that optimize community benefits and prevent adverse impacts. CalRecycle's Office of Public Affairs develops resources for Californians to advance zero waste and advocate for their communities. The department is currently developing more mechanisms to foster circularity.

To mobilize more Californians and grow circular systems, the state needs to communicate clear solutions in regionally relevant, accessible platforms and appropriate languages. These efforts should improve the understanding of community concerns, help identify solutions, and inform the development of community benefits agreements. Key players can identify challenges, opportunities, and collaborations that make zero-waste recommendations more likely to be adopted. For example, Portland created a **Waste Equity Citizen Advisory Council** to support the Oregon Metro Regional Waste Plan.

Pathways for Community Engagement and Capacity Building Recommendation M:

Three primary pathways for exploration have been identified to foster open dialogue with residents and communities to integrate continuous and inclusive input from all voices.

First Cycle	2027-2033
Key Parties for Implementation	CalRecycle, State Agencies, Local Jurisdictions, Non-governmental organizations, Community Based Organizations, Tribes, Californians
◆ **Pathway**	◆ **Key Action**
M1: Conduct meaningful community engagement through channels to share feedback, concerns, and ideas, and develop opportunities for active participation. Where feasible, engagement efforts should strive to meet these groups where they are, including faith communities, schools, businesses, and conferences/symposiums for community-based organizations, to gather input on infrastructure development concerns, community needs, and other topics. This pathway should record all the relevant opportunities for Californians to be involved as individuals, as part of the labor force, and in their communities. Making the connection between day-to-day activities and zero-waste outcomes will strengthen support for the Plan.	Assess current zero-waste feedback channels and response rates to determine if additional mechanisms are needed. Develop a list of potential accessible platforms for sharing ideas, concerns, and feedback. Track input for follow-up and transparency. Promote events, workshops, and programs for circular economy education. Facilitate community member involvement in local zero-waste initiatives for input and engagement. Highlight community contributions to increase transparency and foster ownership.
M2: Highlight the benefits of the circular economy to build enthusiasm and momentum. Benefits include green jobs and grant opportunities. Emphasizing the economic potential of the circular economy and engaging broader audiences will increase support and interest in zero waste. This pathway should show an improved understanding of community concerns.	Review effectiveness of previous educational initiatives (e.g., PRO campaigns). Develop educational content about the benefits of circular transitions, including clear examples of how investments support community goals. Conduct prioritization of initiatives informed by research from recommendation I.
M3: Facilitate Tribal consultation. This pathway ensures dedicated Tribal consultation for open, ongoing, and inclusive dialogue throughout Plan implementation. This will follow **CalEPA's Tribal Consultation Protocol,** issued in February 2020. Tribes are a critical group to engage in government-to-government facilitation. Their community members and lands merit consideration	Identify interested Tribes to participate in continuous input on elements of the Plan, and individuals assigned to roles outlined in the CalEPA Tribal Consultation Protocol. Notify affected Tribe(s) by issuing a letter, with attention to recommendations that may affect them or their natural or cultural resources. Facilitate input from identified Tribes via various communications methods (e.g., written

to ensure that Plan implementation is working in concert with Tribal priorities and goals. Implementation should consider cultural and geographic context and may need to adapt to best suit community needs.	communications, public workshops and listening sessions, site visits). Provide follow-up feedback to Tribes involved in the consultation, outlining how their input was considered and incorporated in a letter from the designated consultation official.

Case Study

Tribal Composting Needs Assessment

In July 2024, CalRecycle launched a Tribal Composting Needs Assessment in partnership with Kauffman and Associates, Inc. to learn more about Tribal composting initiatives and to shape future CalRecycle programs. This initiative supports the Governor's nature-based solution agenda called for in **Executive Order N-82-20** and the implementation of **the Pathways to 30x30**, SB 1383's statewide target, and **Natural and Working Lands Climate Smart Strategy**.

These statewide efforts aim to:

- Protect and restore biodiversity
- Fight climate change
- Build a circular economy
- Advance equity and opportunity across California

Engagement consisted of interviews, a Tribal advisory panel, and three regional listening sessions hosted by Santa Ynez Band of Chumash Indians, Chicken Ranch Rancheria of Me-Wuk Indians, and Big Valley Band of Pomo Indians. The process expanded CalRecycle's understanding of Tribal perspectives related to composting and helped build relationships to strengthen partnerships with Tribes in transitioning to zero waste. The Final Needs Assessment Report was published in November of 2025.

Cross-Cutting: Community Engagement and Capacity Building Recommendation N:

Proactively engage and support capacity building for Tribal, rural, and environmentally burdened communities to participate in California's circular transition.

Meaningful engagement and capacity building maximizes benefits for underserved communities and increases effectiveness when individuals feel heard or involved. This approach ensures the circular economy reduces existing inequalities rather than making them worse.

Many Californians live near multiple sources of pollution, and some communities face greater health risks. These vulnerable communities often lack access to information about zero waste, circularity, and how to advocate for environmental and public health. Reducing waste mismanagement in low-income areas can improve health, boost economic opportunities, and support inclusion in the circular economy. By consulting with Tribes and engaging early and intentionally with overburdened communities to build capacity and empower them, California can ensure a waste-free future that benefits all.

Pathways for Community Engagement and Capacity Building Recommendation N:

Two primary pathways for exploration have been identified to proactively engage and empower underrepresented communities to participate in California's zero waste and circular transition.

Value for People: Community organizations reach more people and amplify their impact with support for zero-waste work.

First Cycle	2028-2034
Key Parties for Implementation	CalRecycle, Local Jurisdictions, Non-governmental Organizations, Community Based Organizations, Tribes, Educational/Research Institutions
◆ **Pathway**	◆ **Key Action**
N1: Amplify and expand connections to community-led initiatives. This pathway should identify organizations that engage with the community and find opportunities for public sector entities to collaborate with these organizations. It should empower communities and build trust through long-term engagement and capacity-building efforts. These efforts should leverage existing resources, such as community centers and academic institutions. Local and regional efforts, especially in rural areas, could build capacity to address interjurisdictional challenges such as illegal dumping and incompatible materials that don't have recovery avenues.	Identify and engage with community-led networks, including those currently and not yet connected with zero-waste efforts, and follow models for collaboration, such as community benefits agreements. Create a plan for early and frequent engagement across a broad and diverse network of communities to activate and amplify all voices. Solicit input and seek to understand the current state, barriers, and zero-waste needs (e.g., pollution impacts). Develop a toolkit of solutions to address identified needs and gaps. Broaden channels for communications and ways to participate with communities and organizations. Collect and highlight case studies of community efforts relevant to the Plan. Provide capacity-building for identified groups to engage and activate through clear and actionable steps. Develop/convene partnerships to provide concrete solutions with paths, steps, and funding to reach zero waste.
N2: Meet groups where they are and establish liaisons to support circularity and avoid negative impacts in their communities. Local-level liaisons and advocates need channels to provide input on the transition to zero waste and identify resources to address community needs. This pathway should include community engagement liaisons and sufficient government communications staff to support outreach, (especially when new programs are created) where feasible and appropriate.	Identify trusted local channels with established links to underrepresented communities (e.g., existing councils and meetings). Identify liaisons to provide consistent communication and support. Gather community insights to inform policy and program development.

Case Study

Zero-Waste Academic Building

Chou Hall at the University of California (UC) Berkeley exemplifies a closed-loop system in its pursuit of zero waste, serving as a pioneering model in the Haas School of Business. As the first academic building in the U.S. with zero-waste certification through **the TRUE program, which has already diverted over 5.6 million tons from global waste streams,** Chou Hall integrates sustainability into its core operations.

The building functions as a living laboratory where sustainability solutions are tested and applied, emphasizing the importance of early engagement, comprehensive education, and waste audits. By achieving zero-waste certification, Chou Hall sets a high standard for other campus buildings and reinforces the critical need for innovative waste management practices in educational settings.

Cross Cutting: Partnerships

Future State: Proactive avenues for cross-government and public/private partnerships are established to drive the circular transition in communities.

Cross-Cutting Recommendation:

Lead local, national, and international multi-party collaboration to support zero-waste implementation.

This recommendation focuses on partnerships that create change for a circular economy through processes rather than infrastructure investment.

Partnerships example outcomes along the MMH include:

- **Refuse**: Expand private-public partnerships that have successfully avoided or reduced waste
- **Rethink**: Design California's school campuses, cultural, and entertainment venues and events as models of zero-waste systems
- **Reuse:** Develop shared (industry, state, national, or international) criteria for standardized, reusable containers
- **Repurpose:** Build hubs for repurposing across the state through public-private partnerships
- **Recycle:** Establish cross-border partnership for visibility into recycled material value chain for exported materials

Partnerships Recommendation and Pathways:

Cross-Cutting: Partnership Recommendation O:

O. Lead local, national, and international multi-party collaboration to support zero-waste implementation.

Value for Economy: Governments and nonprofits reduce costs by sharing resources through strong zero-waste partnerships.

Partnerships have been used to advance zero waste and circular economy efforts globally. The **Zero Waste International Alliance** (ZWIA) is a global organization promoting zero-waste principles and has partnered with various global and regional entities, including municipalities, businesses, and advocacy groups, to support the transition to zero waste and promote sustainable waste management practices.

The state has a track record of building coalitions and partnerships to support ambitious policy goals. These examples can model ways of thinking about partnerships in support of the Plan. For example, within the innovation ecosystem, California is home to multiple industry clusters such as the **Golden Triangle** biotechnology cluster.

Early partnerships can also serve as flagship examples to ignite cultural change and bring awareness to zero-waste successes and barriers within California. For example, the planning for the Los Angeles 2028 Summer Olympics can benefit from understanding **Paris 2024's Circular Economy Strategy** and approach to partnerships. Other examples include zero-waste programs and pilots in California at concert venues, university stadiums,[32] airports,[33] and beyond.

The pathway in this recommendation focuses on partnerships across different levels of government. However, partnerships (whether formal or informal) with all interested parties are essential to California achieving a circular economy. These include school districts, universities, community-based organizations, non-governmental organizations, and businesses, including those within the materials management industry (such

as reuse, repair, salvage, and other circular businesses), manufacturers/brands, trade associations, and other interested parties. These types of partnerships are also referenced throughout the Plan in other recommendations.

Case Study

Olympic Circular Economy Strategy

The **Paris 2024 Olympic Games** integrated a circular economy model into every phase of the event. This innovative approach addressed resource scarcity and enhanced sustainable management well before the games commenced, creating a reference framework for future Olympic organizing committees.

Paris 2024's success in sustainability was rooted in several key initiatives. Their strategy emphasized material reuse and recycling. They achieved more than 50% reduction in single-use plastics used for beverages and ensured that nearly all assets used for the Games would have a second life. Their waste management included a collection system for pallets and plastic films, along with enhanced sorting practices. These efforts resulted in more than 78% of waste recovered or avoided from the operational phase. It was estimated that 60% less waste was generated in the operational phase compared to the London 2012 Olympic Games.[34]

The Paris 2024 model offers lessons for CalRecycle and for other regions, particularly for upcoming events like the LA 2028 Games. Strategies such as repurposing existing infrastructure, adopting policies for material reuse, and promoting eco-friendly, locally produced goods can enhance sustainability efforts and support local economies.

Pathways for Partnerships Recommendation O:

Three primary pathways for exploration will enable California to lead local, national, and international multi-party collaboration to support zero-waste implementation.

First Cycle	2027-2032
Key Parties for Implementation	CalRecycle, State Agencies/Government, International Governments, Tribes, Nonprofits/Community Based Organizations, Raw Material Suppliers, MRFs, Intermediate Manufacturers, Corporate Enablers
◆ **Pathway**	◆ **Key Action**
O1: Facilitate the development of local, state, national, and international public-private partnerships (PPP) to accelerate common goals and share costs. This pathway would connect regional entities with the intent of exploring a PPP and creating a clear PPP pathway and function. Developing new PPPs such as these could provide a crucial missing link in North America-focused partnerships for a circular economy.	Conduct a review of existing entities/partnerships of interest for PPPs, including challenges/gaps (e.g., connecting regional parties with interest in reuse pilots). Integrate partnerships from the national and international levels to California-specific PPPs (e.g., identifying complementary partnerships to accelerate reuse and recycling for high-priority materials like construction and demolition). Facilitate connections between public and private interested parties to form partnerships (e.g., forums for recruiting partners).

Developing PPPs for regions or product categories could enable flexibility similar to Caltrans's PPP program, which includes demonstration projects.[35]	Develop joint funding and implementation mechanisms to accelerate shared goals (e.g., announce fund for reuse pilot). Highlight successful partnerships as replicable models for other interested parties.
O2: Establish channels for intrastate, national, and international collaboration to tackle cross-border challenges. This pathway builds on existing MOUs with national governments and municipalities, including but not limited to information exchange. It includes: • Sharing import and export data to find recycling gaps and guide investments • Mitigating the perceived risks of sending materials out of the country for recycling • Improving visibility of end-of-use or recovery of export materials	Identify cross-border challenges and key areas (e.g., transparency challenges, materials-specific opportunities) for collaboration. Initiate or further develop relationships with cross-border points of contact. Develop shared frameworks to ensure responsible and equitable circular outcomes. Create regular forums for knowledge exchange on circular economy initiatives (e.g., EPR, data tracking insights).
O3: Collaborate across local, state, and national agencies, as appropriate, to share key materials management data to inform full picture of California materials consumption and management. This pathway increases visibility and data sharing across agencies that manage materials outside of CalRecycle, such as the state **Department of Toxic Substances Control**, which manages highly hazardous waste. Adding data on these material streams would create a more accurate picture of waste and more opportunities to collaborate. Metrics related to zero waste that support overlapping goals from cross-agencies, local governments and other entities would strengthen collaborative efforts. Additional context on the benefit of these connections is included in data and monitoring recommendation K.	Evaluate existing interagency collaborations to identify key learnings and insights. Create an interagency data sharing protocol for materials management. Conduct a comprehensive assessment of interagency material flows (what happens to disaster debris, construction waste) and management outcomes (who is responsible for their management). Use shared data to identify key leverage points for circular solutions.

Case Study

Santa Cruz Food Recovery Network

Santa Cruz County, CA, is implementing a food recovery program in compliance with California's SB 1383, which mandates that commercial food generators donate surplus edible food. By partnering with local food banks and organizations, including **Second Harvest Food Bank** and its 70 partners, the county enhances food recovery and reduces waste. Meetings for SB 1383 edible food recovery have evolved into a think tank, fostering collaboration, knowledge exchange, and resource sharing.[36] The food bank acts as a thought partner, collaborating with other nonprofits and government agencies. The program also focuses on reducing methane emissions, which are 84 times more powerful than CO_2. Expanding this waste management model implemented in Santa Cruz County to other regions could have a significant impact, namely substantial reductions in greenhouse gas emissions on a statewide level. Additionally, fostering increased collaboration between local jurisdictions and food recovery organizations has the potential to not only reduce food waste but also enhance food security for millions of Californians.

What's Next for California

Laying the Foundation for Implementation

The Zero Waste Plan provides the blueprint to guide California's transition to a circular economy and waste-free future. Achieving zero waste will require coordinated effort across entities such as state agencies, local governments, businesses, and communities, each playing a role in turning the Plan's recommendations into action.

The next step for California's zero-waste journey will be to define the implementation plan. This should include identifying clear owners and active implementation actors for initiatives and pathways as prioritized by the timelines. This is expected to require standing up working groups across agencies, Tribal, and local governments, and collaborating with the private sector, elected officials, and communities.

This should include defining CalRecycle's role in California's full zero-waste journey, particularly in implementation plans, and could include expanding the department's formal authority to act on or coordinate efforts that currently fall outside its statutory mandate.

The implementation plan should also evaluate and identify the funding required and available funding sources. This should include both public and private sector funding, and actions related to the financial mechanisms recommendations to attract and unlock investments and funding for zero-waste efforts.

With these foundational steps in place, California will be positioned to move from planning to action, ensuring that zero-waste efforts are effectively resourced, coordinated, and advancing toward long-term success.

Tools and Solutions

To track progress and ensure accountability in implementing the Plan, a variety of data-driven tools and solutions should be leveraged. These solutions address key gaps in California's current materials management system by improving data accessibility, program evaluation, and decision-making through user-friendly, actionable insights that enable continuous refinement of programs and policies. Standardized data formats and reporting structures will improve comparability and analysis for KPI and data monitoring and subsequent adjustments.

To identify priorities for the Plan, Material Characterization Studies are an effective tool that show which material streams have the highest levels of disposal. To achieve our mandated goals, such as those in AB 341 and SB 1383, we need to prioritize the largest waste streams through systematic processes. These include materials that already have existing pathways and infrastructure for disposal, yet still comprise a

large percentage of the disposal stream and require interventions due to contamination, improper sorting, or other factors. Some of the materials that are prevalent in the waste stream (based on a 2025 CalRecycle Material Characterization Study) could be addressed through Plan recommendations.

Material Category	Examples of Relevant Plan Recommendations
Wood	B, C, E, F, G, I, J, K
Food Waste	B, C, E, F, G, I, J, K
Old Corrugated Cardboard	I, J
Construction and Demolition Inerts	B, C, F, G, I, J, K

Potential Tracking and Monitoring Solutions

- **Centralized Zero-Waste Data Platform** – A digital hub that consolidates reporting from state agencies, local governments, businesses, and other interested parties to improve alignment on progress and enable near real-time data analysis. This platform could serve as a comprehensive resource for tracking material flows, policy impacts, and economic benefits, helping to create a single source for circular economy progress. To ensure consistency and comparability across reporting entities, this platform should incorporate standardized data collection methods, reporting formats, and key performance metrics. By establishing common definitions and calculation methodologies, the platform would enhance the reliability of insights and allow for more effective decision-making at both the state and local levels.
- **Circular Economy Impact Model** – A framework to measure economic growth, job creation, and material reuse in California's transition to a circular economy. This model could help quantify how investments and innovations contribute to statewide economic and environmental goals, filling a key gap in understanding the full value of circular strategies.
- **Community and Business Engagement Tools** – Solutions that facilitate participation and data-sharing from businesses and communities, ensuring that progress is informed by on-the-ground insights. This could include digital reporting tools, crowdsourced material exchange platforms, and localized waste tracking solutions to improve access to real-time material data and accelerate local circular solutions.
- **Cross-Agency Data Integration** – A collaborative approach to align material data with other state priorities, including climate action, public health, and economic development. Strengthening data coordination across agencies could improve California's ability to make informed, holistic decisions and ensure that circular economy initiatives are aligned with broader state goals.

Timeline Scenario

The Plan presents an implementation scenario projected out to 2045. There are various external factors — such as funding availability, regulatory momentum, and private sector participation — that will ultimately impact the speed and scale of implementation.

Rather than setting a fixed end date for zero waste, this timeline illustrates the expected duration for one full iteration of each recommendation**,** meaning the time required to achieve a meaningful cycle in California's waste and materials management system. The timeline scenario shows that impact realization will follow the implementation and take approximately the same duration as the implementation.

Zero waste and transitioning to a circular economy is an exercise in continuous improvement. California should aim to continue implementation efforts and refinement on each of the identified recommendations. However, this timeline will require significant resourcing and coordination across interested parties, including but not limited to, state agencies, local governments, and the private sector.

2045 Timeline Scenario

Policy and Regulation

A: Adopt a circular-first framework for policies that prioritize highest and best use based on the MMH.

- 2028-2040 (iterative)
- Impact realization from 2040-2045

B: Review and refine existing policies, programs, regulations, and statutes for highest and best use based on the MMH.

- 2027-2039 (iterative)
- Impact realization from 2039-2045

Financial Mechanisms

C: Align market signals with zero waste and circular behavior.

- 2027-2039 (iterative)
- Impact realization from 2039-2045

D: Establish sustainable public sector funding that supports a circular economy.

- 2027-2039 (iterative)
- Impact realization from 2039-2045

Infrastructure for Circularity

E: Reduce challenges and increase benefits for infrastructure development and modifications.

- 2027-2035 (ongoing and iterative)
- Impact realization from 2035-2043

F: Grow circular businesses and develop systems for equitable distribution of materials.

- 2028-2035 (iterative)
- Impact realization from 2035-2043

Research and Innovation

G: Support research initiatives and the development, adoption, and scaling of circular solutions.

- 2027-2031 (ongoing and iterative)
- Impact realization from 2031-2035

H: Increase use of circular design principles in products and business models.

- 2028-2034 (iterative)
- Impact realization from 2034-2041

Communication for Cultural and Behavioral Change

I: Develop tailored communication and education campaigns based on research of Californians' behaviors, beliefs, needs, and interests.

- 2028-2031 (iterative)
- Impact realization from 2031-2034

J: Make it easier to find and use resources and tools for zero waste.

- 2027-2031 (ongoing and iterative)
- Impact realization from 2031-2036

Data and Monitoring

K: Expand and standardize data visibility across material types and management pathways through open and crowdsourced data.

- 2028-2034 (iterative)
- Impact realization from 2034-2041

L: Improve and expand data analysis and monitoring to inform new solutions and refine existing systems.

- 2027-2030 (iterative)
- Impact realization from 2030-2034

Community Engagement and Capacity Building

M: Foster open dialogue with community members to integrate continuous and inclusive input from all voices.

- 2027-2033 (iterative)
- Impact realization from 2033-2040

N: Proactively engage and support capacity building for Tribal, rural, and environmentally burdened communities to participate in California's circular transition.

- 2028-2034 (iterative)
- Impact realization from 2034-2041

Partnerships

O. Lead local, national, and international multi-party collaboration to support zero-waste implementation.

- 2027-2032 (ongoing and iterative)
- Impact realization from 2032-2036

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Glossary Of Terms

Bioeconomy: Economic activity derived from biotechnology and biomanufacturing.

Biomanufacturing: Microbes, and different organisms (bacterial cells, viruses, yeast, cyanobacteria, algae) can be programmed to make a variety of products such as food, feeds, fuels, fibers, bioplastics, natural rubbers, renewable chemicals, nutraceuticals, non-food materials, and other high value products. This process utilizes sustainable biomass or a sugar source as feedstock, providing an alternative to petrochemical-based production for many products like plastics, fuels, and material.

Biotechnology: Any technological application that uses biological systems, living organisms, biological processes, or derivatives thereof, to make or modify products or processes for specific use.

By-product: A substance, material, or product that is generated as a secondary result of making something else. This may be generated during manufacturing or processing, rejected as inferior during the process of grading or separating, or produced via an industrial or biological process. By-products that are considered to be valuable and intentionally produced as a secondary product are sometimes call “co-products.”

California Native American Tribe (Tribe): A Native American Tribe located in California that is on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004.

Capacity Building: Strengthening local coordination, leadership, knowledge, skills, expertise, and access to resources in California Tribes and under-resourced communities with the goal of helping to develop or increase the ability of that community to independently compete for grants and implement projects in the future.

Circular business models: Model to create, deliver, and capture economic value while designing waste out of the system by changing product design and inputs and/or offering services to extend product life and utilization.

Circular economy: An economic model that systematically eliminates waste by decoupling value creation from resource extraction. Circular economy serves as a systems-based framework for achieving zero-waste goals by managing materials and products in a manner that keeps products, components, and materials at their highest utility and value for as long as possible to preserve the embedded labor, material, and capital costs. In a circular economy, when a product reaches the end of its useful life, its materials and components are returned to the system as inputs for new products through activities such as reverse logistics, recycling, composting, and remanufacturing. Visualized in Figure 2.[37]

Circular materials management: A systematic approach to materials management which focuses on using and reusing materials more productively throughout their lifecycle; in line with circular economy principles. Also referred to as “Sustainable Materials Management” and is in contrast to “waste management”.

Circular principles: The foundational concepts or guidelines that enable the circular economy. This includes a focus on designing waste out of the resource ecosystem, keeping materials and products in use as long as possible, and maximizing the value retained in materials and products in circulation.

Closed-loop systems: Processes in which waste serves as an input, thus eliminating the notion of an undesirable by-product. In a closed-loop system, all materials are used, reduced, and reused within a closed environment.

Co-digestion: Anaerobic digestion of multiple organic wastes, such as food waste and green waste, to produce renewable energy or nutrient-rich soil products.

Communities: When used without a particular modifier, "communities" in this Plan refers broadly to all groups of people sharing geographic, social, or common interests, including environmentally burdened or

disadvantaged populations, local groups and networks, Tribal communities, neighborhoods, and jurisdictional groups.

Composting: The decomposition of organic materials by aerobic microorganisms. Composting facilities manage the amount of moisture and oxygen and the mixture of organic materials for optimal composting conditions. The composting process emits heat, water vapor, and biogenic carbon dioxide, reducing the raw organic materials in mass and volume to create compost.

Decoupling: The separation of economic growth or value generation from resource consumption and extraction.

Edible food recovery: The collection of edible food that would otherwise go to waste and redistributing it to feed people in need; sometimes referred to as food rescue.

End-of-life / End-of-use: Refers to the stage at which products or materials have reached the end of their useful life and are no longer in active use, at which point they can be recycled, composted, or disposed.

Energy efficiency investments: Investments in infrastructure that reduce the energy consumption required to achieve the same results. This includes measures such as insulation, reducing line loss in energy transmission and distribution, and other improvements that enhance energy efficiency across various settings, from homes to large organizations.

Energy transition: Refers to the global energy sector's shift from fossil-fuel-based systems of energy generation — including oil, natural gas, and coal — to renewable energy sources like wind and solar. Energy storage through technologies such as batteries are a key component of the energy transition as they enable energy reliability despite the variable nature of renewable generation.

Environmental justice: The fair treatment and meaningful involvement of people of all races, cultures, incomes, and national origins, with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies to reduce pollution burdens and ensure a healthy environment for all.

Extended Producer Responsibility (EPR): An environmental policy approach that holds producers responsible for product management throughout the product's lifecycle.

Greenhouse gas: Any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N2O), hydrochlorofluorocarbons (HCFCs), ozone (O_3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Landfill: A permitted facility that provides a legal site for final disposal of materials, including mixed solid waste, beneficial materials used for landfill construction, alternative daily cover, and specialized material sites, such as waste tires and construction and demolition waste.

Language access: Providing access to information, programs, benefits, and services to people with limited English proficiency by ensuring that language is not a barrier to access.

Lifecycle (Material Lifecycle or Product Lifecycle): Product lifecycle or material lifecycle refers to the collection of all the stages (or phases) that a product or material moves through from inception (e.g., raw material) to the end of its useful life. A product's lifecycle can be extended by keeping the product in use via solutions such as repair, sharing models (e.g., rental, pay-for-service), reuse (i.e., donation to a new owner), repurpose (i.e., using the product or material for a new purpose). The stages of the lifecycle are included in the circular economy model (Figure 2). This is not to be confused with "lifecycle analysis," which is an evaluation of the environmental impacts of a product or material across all lifecycle stages and not the lifecycle itself.

Material Characterization Study (MCS): Estimates the volume and composition of the landfilled waste stream into distinct material types for the commercial, residential, and self-haul sectors in California.

Materials management: A proactive approach to managing the full lifecycle of materials and products, including before they are considered "waste," in contrast to "waste management."

Materials Management Hierarchy (MMH): Offers a framework for material use decisions by evaluating the need for resource use and ensuring the highest and best use of resources that are deemed necessary.

Multi-use: The term multi-use describes products that serve as alternatives to single-use products. This can include refillable or reusable products such as containers, cutlery, bags, and more. It may refer to products managed by California's Beverage Container Recycling Program, as well as those not covered by the program.

Organic waste (as defined in the SB 1383 regulations): Solid wastes containing material originated from living organisms and their metabolic waste products including, but not limited to, food, green material, landscape and pruning waste, organic textiles and carpets, lumber, wood, paper products, printing and writing paper, manure, biosolids, digestate, and sludges.

Per- and polyfluoroalkyl substances (PFAS): A group of more than 14,000 human-made substances that are not naturally occurring and are resistant to heat, water, and oil.

Recycling: The process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise ultimately be disposed of onto land or into water or the atmosphere, and returning them to, or maintaining them within, the economic mainstream in the form of recovered material for new, reused, or reconstituted products, including compost, that meet the quality standards necessary to be used in the marketplace.

Remanufacturing: Use waste materials to make recycled-content intermediate and/or final products.

Rendering: The process of converting recently deceased livestock and other inedible materials, such as inedible kitchen grease, into useful byproducts like feed protein.

Repair: Extend the useful life and value of existing products and materials by fixing a damaged or malfunctioning product to restore its original functionality and delay or avoid the need for new products or materials (i.e., replacement).

Repurpose: Transition existing products and materials to a new lifecycle by using the product/material for a different purpose or function than originally intended (without processing into new, raw material).

Responsible end-market: A materials market in which the recycling and recovery of materials are conducted in a way that benefits the environment and minimizes risks to public health and worker health and safety. (Plastic Pollution Prevention and Packaging Producer Responsibility Act [42040 - 42084])

Reuse: Keeps products in use in their original form and for their original purpose.

Solid waste: Refuse that may be mixed with or contain nonorganic material, processed industrial materials, plastics, or other recyclables with the potential for recovery. It includes residential, commercial, and institutional wastes.

Sorting: The process of separating different types of materials based on their characteristics and requirements for further materials management or processing.

Source reduction: Any action that causes a net reduction in the generation of solid waste. This includes reusing materials, reducing volume of materials used or products consumed, replacing disposable goods with reusable goods, reducing packaging, and food reuse through edible food recovery. This is often also known as "waste prevention."

Waste management: The traditional processes of collection, transport, treatment, disposal, or processing required to dispose or divert materials that are considered to be waste; only addresses materials that are considered to be waste.

Waste prevention: See Source Reduction.

Zero waste: A comprehensive approach to conserving and managing California's resources by rethinking design to eliminate waste, reducing what we use, reusing and repurposing what we have, and responsibly recycling remaining materials to protect the environment and health for all.

Abbreviations and Acronyms

AB Assembly Bill

AI Artificial Intelligence

CA California

CalEPA California Environmental Protection Agency

CalRecycle California Department of Resources Recycling and Recovery

CO_2 Carbon Dioxide

CRV California Redemption Value

ECLAC United Nations Economic Commission for Latin America and the Caribbean

EIR Environmental Impact Report

EMF Ellen MacArthur Foundation

EPA United States Environmental Protection Agency

EPR Extended Producer Responsibility

EU European Union

GDP Gross Domestic Product

GHG Greenhouse Gases

KPI Key Performance Indicators

MAC Municipal Assistance Coordinators

MMH Materials Management Hierarchy

MOUs Memorandums of Understanding

MRFs Material Recovery Facilities

NGOs Non-governmental Organization

NSJV North San Joaquin Valley

PFAS Per- and Polyfluoroalkyl Substances

PPP Public-private Partnerships

PRO Producer Responsibility Organization

RVM Reverse Vending Machine

SB Senate Bill

SSFSC South San Francisco Scavenger Company

SSMAP Student Social Media Ambassador Program

UC University of California

UN United Nations

U.S. United States of America

ZWIA Zero Waste International Alliance

Overview of the Process for the Recommendations Report Submitted to CalRecycle and the Zero Waste Plan

In June 2024, CalRecycle published a Baseline Report consistent with SB 101 (The California Budget Act of 2023). In parallel with the Baseline Report development, CalRecycle worked with a contractor to create an internal overview Recommendations Report with oversight from a Steering Committee spanning analyses of available CalRecycle and external data, benchmarking of leading zero-waste plans, synthesizing dozens of case studies of circular economy innovation, and directly engaging with key actors.

The Zero Waste Plan (Plan) details fifteen (15) recommendations which were developed from the Recommendations Report, as well as pathways and actions for achieving each. Case studies demonstrating real world examples are included throughout to illustrate replicable successes.

CalRecycle engaged over 30,000 interested parties in the development of the Plan from 2024-2025. Engagement activities included:

- A survey sent to subscribers of all CalRecycle listservs to identify priority topics to address
- A series of public workshops (August 2024, January 2025, October 2025) to share progress updates and solicit feedback on the Baseline Report and the Plan recommendations
- Cross-sector by-invitation discussions on source reduction and product design for circularity and infrastructure
- Dedicated by-invitation workshops or presentations for non-governmental organizations, Tribes, and higher education representatives
- Interviews to inform examples of circular economy successes in California to feature in the Plan
- A series of five listening sessions in March 2025 to gather feedback on the recommendations and pathways (split by sector: public, private, waste/recycling, Tribes, social)

CalRecycle reviewed and considered all live and written comments submitted over the course of the Plan development.

How California's Materials Management Hierarchy Was Developed

The Materials Management Hierarchy (MMH) offers a structure to guide materials management decisions. While many MMH variations have been developed and adopted globally, all have the same design and overarching objective.

Its design as an inverted pyramid emphasizes the importance of prioritizing highest and best use, preventing waste generation at the source, and retaining product and material value while minimizing environment and human health impacts at every stage. This version, shown in Figure 1, was developed specifically for the State of California to highlight the layers that contribute to source reduction and emphasize the outcome of a particular stage (e.g., extending the useful life of a product) instead of a process or technology for managing materials (e.g., mechanical decomposition).

While the layers of the MMH pyramid are already ordered from most value retained to least value retained, there is also opportunity to prioritize solutions within a given layer to optimize for value retention or make material-specific versions of the pyramid. This type of framework should be incorporated into California's overarching circular materials management framework as described in policy and regulation recommendation A.

How the Zero Waste Definition Was Developed

As part of the process of developing a definition for the state, CalRecycle conducted a benchmarking exercise of zero-waste definitions used across the state, country, and world. This process identified common themes, which include incorporation of the principles of the MMH, the importance of a comprehensive approach, and a connection to equity and health for our people and planet. These themes,

along with an interest in ensuring that the definition remains evergreen for the state, were used to draft a zero-waste definition for California and the Plan.

How the Value of the Circular Transition was Calculated

To estimate the economic impact of California's transition to a circular economy, the results of the United Nations (UN) Economic Commission for Latin America and the Caribbean's (ECLAC) macroeconomic model to California were applied. ECLAC's research[38] was selected as the core starting point of calculations due to its focus on economic transformation across industries and its applicability to economies with diverse sector compositions, making it a relevant benchmark for California.

By aligning this methodology with California's industry composition, it is estimated that a full circular transition by the year 2050 would result in an incremental 531,000 new jobs and an annual increase in GDP of $411 billion.[39] The model highlights how circular strategies can drive economic growth, resilience, and competitiveness.

Driving even a portion of this circular transition has meaningful economic implications. These economic benefits can be locally targeted by focusing efforts on communities most in need of an economic boost.

This analysis reinforces that a circular transition is not just an environmental strategy, but an economic imperative. The Plan outlines actions that align with California's existing economic strengths, ensuring that industries can seize opportunities in the circular economy while maintaining the state's leadership in sustainability-driven innovation.

Public Input Survey Results

Overview: August 2024 Public Input Survey[40]

- 30K+ survey requests sent out
- 302 individual responses
- 235 unique ZIP codes
- 41% familiar with CA's Zero Waste Plan
- 65% self-identified as engaged in zero waste

Count of Responses by Group

Local Jurisdiction	74
None of these options apply to me	55
Community Group	29
Non-Governmental Organization	22
Education/Research Institution	22
Producer/Manufacturer	18
State Agency	13
Federal Government	13
Collector/Hauler	9
Trade Association	8
Circular Technology/Solution Provider	7
Corporate Enabler	7
Retailer	7
Recycled Material Processor	4
Wholesaler/Distributer	4
Corporate Consumer	3
Composting/Wastewater Facility	3
Reuse/Donation Center or Food Bank	1
Tribal Government	1
Mixed Waste Processor/Transfer Station	1
State Policy Maker	1

Details: August 2024 Public Input Survey

Respondents rank-ordered key topics with potential to "move the needle"

(in order from first choice to last choice)

Infrastructure for Circularity – ranked second highest as #1 and most respondents ranking in top 3

Financial Mechanisms – ranked third highest as #1 and most respondents ranking in top 3

Comms and Awareness – ranked highest as #1 and over half of respondents ranking in top 3

Policy and Regulation – ranked fourth highest as #1 and fairly equally as high and low choices

Data and Monitoring – ranked fifth highest as #1 and most respondents ranking in mid to lower rankings

Partnerships – ranked lowest as #1 and most respondents ranking as lower choices

Research and Innovation – ranked sixth highest as #1 and most respondents ranking in mid and lower choices

Other (varies) – majority ranking as last choice

Respondents want to see a transition to circularity…

"The transition to a more circular economy is important to California"

Strongly Agree 69%

Agree 19%

Neutral/I Don't Know 6%

Disagree 3%

Strongly Disagree 3%

And do not perceive the status quo as sufficient

"My community or business has what we need to participate in zero-waste practices"

Strongly Agree 8%

Agree 12%

Neutral/I Don't Know 26%

Disagree 33%

Strongly Disagree 21%

Note: Respondents self-identified their group based on what they felt best represented them.

Definitions of Key Parties

Group	Key Parties	Definitions
Public Sector	Federal Government	United States government
	Local Jurisdiction	California county, city, municipal government entitles
	State Agencies	Executive branch of the California state government
	Elected Officials	State policy makers
	California Native American Tribes (Tribes)	Native American tribes located in California that are on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004
Operational and Industry Actors	Circular Solution/Technology Providers	Third-party developers of circular solutions or technology (startups, etc.)
	Composting/In-Vessel Digestion (including Wastewater Facilities)	Entity which processes/treats organic waste
	Corporate Enablers	Commercial businesses or organizations that support the waste management industry (investors, builders, etc.)
	Corporate Generators	Commercial businesses or organizations that purchase or use products/materials for their own consumption or operations
	Intermediate Manufacturers	Entities which transform recyclable materials into processed post-consumer materials
	MRFs	Entities that sort recyclable materials
	Producers/Manufacturers	Entities who use raw materials to produce and/or manufacture products
	Raw Material Suppliers	Entities who mine/excavate/source raw materials
	Resource Management Organizations	Entities that focus on safe management of a resource, including collection, transportation, and treatment
	Retailers	Entities which sell goods or services to corporate, governmental, or individual consumers
	Reuse/Donation Centers/Food Recovery Entities	Commercial or nonprofit centers that collect and distribute organic or non-organic material for reuse or redistribution
	Secondary Manufacturers	Manufacturers or producers who use post-consumer materials
	Trade Associations	Industry groups representing part of the waste or materials management industry
	Waste Collectors/Haulers	Operators of waste removal services
	Wholesalers/Distributors	Entities who buy or distribute bulk goods for resale
Social Sector	Educational/Research Institutions	University, school, or other research and education entities
	Non-governmental Organizations	Non-governmental organizations that have an interest in the environment or materials management (environmental action, justice, or advocacy)
Residents	Californians	California residents
	Community Based Organizations	Organizations incorporated for the purpose of providing services or other assistance to economically or socially disadvantaged persons within their designated communities

Public Comments

CalRecycle is committed to drafting the Zero Waste Plan (Plan) using a public process. As such, all public feedback is reviewed and actively considered to improve the study and help California achieve the goals of Plan. This appendix includes all public comments received by CalRecycle, including those sent to the Zero Waste inbox regarding the Zero Waste Plan during the open comment periods from August 15 to August 30, 2024, January 25 to February 10, 2025, March 27 to April 9, 2025, October 2 to October 17, 2025, and at the corresponding workshops or listening sessions held on August 14, 2024, January 24, 2025, March 17-26, 2025, and October 1, 2025, respectively. This also includes summaries of comments made during the listening sessions on August 26, 2024 and September 16, 2024. Additionally, comment emails, letters and information related to this Plan can be requested via a California Public Records Act request. Requests may be initiated through the **CalRecycle Public Records Portal**. For accessibility purposes, images, figures, tables, and data (non-text items) have not been included in this Appendix and are denoted as ""Non-text item(s) included in body of email are not reproduced here" or "Non-text items incorporated into documents submitted to CalRecycle are not reproduced here". To see the original letter, submit a Public Records Act request through the **CalRecycle Public Records Center.** External sources of data submitted by various organizations can also be made available by submitting a Public Records Act request. External data was not integrated in CalRecycle's analysis and is not validated nor endorsed by CalRecycle.

Workshop – August 14, 2024

Comment 1:

Name: Alejandra Chase
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Support more reuse systems, repair and fixing centers

Comment 2:

Name: Amy Thomas
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Hazardous waste, there are no affordable or good options for diversion

Comment 3:

Name: Angela Pan
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: How is source reduction defined? Is it waste that didn't happen? How is the recycling rate broken out into percentages for each of the contributors (source reduction vs recycling vs compost vs anerobic digestion vs mulch)? Will the Plan analyze which geographic regions, generating sectors, and materials contribute most to total generation to inform future strategies?

Comment 4:

Name: Cherise Petker
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: What is the plan for wind turbine blades?

Comment 5:

Name: Christine Wolf
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Market development is key for recyclable commodities, organic material (SB 1383 is not enough)

Comment 6:
Name: Evan Edgar
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Recommend Mayor's conference definition of zero waste to include resource conservation, rewarding stewardship, life cycle cost analysis, GHG reductions, shared fiscal responsibility. Baseline Report should have looked at GHG reductions and had a GHG baseline. Include cost to get to zero waste. Include renewable natural gas as a strategy to get to zero waste. Model achieving 75%. Instead of a 2045 goal, look at a 2030 goal. Support carbon farming and composting programs for carbon sequestration, regenerative agriculture. Environmental justice should look at the impact to other states/countries, not just California. Focus on regenerative agriculture, include lifecycle on pesticides. Have a credible supply chain for battery manufacturing. Move away from diesel and landfills. Renewable natural gas is truly circular because it is made locally, we can't track and trace other products as well.

Comment 7:
Name: Grant Readle
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Focus on emissions (quantification for all diversions). Exports cannot be tracked and should not be counted towards zero waste/recycling.

Comment 8:
Name: Heather Smith
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Is there going to be a mechanism for validation and implementation of new composting methods for the reduction of organic waste? Created a novel composting method but it occurs in soil free controlled environment

Comment 9:
Name: Heidi Sanborn
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: The zero waste definition needs a target. Interagency collaboration is needed (CalRecycle, CARB, DTSC) especially around organics and permitting. Truth in labeling, support Green Guides being mandated and updated. Keep toxics out of the recycling stream. Producer responsibility is key, make them pay and address end of life costs. Science based decision making is important, as are responsible end markets.
Imports - let's not import recycled content. It causes contamination and is a national security issue with minerals. Ratify the BASEL Convention. EPR addresses all these issues. Using the CARE example, it resulted in smaller paint sample cans. When producers don't have to pay and they can externalize cost, they can and will. Include recycled content in EPR. Redesign has to be done by the producers, set performance standards for the producers. Infrastructure doesn't matter as much as product design, how will they reduce waste at the source and design for durability? EPR requires producers to think about the end markets for their products. Screen new products on the market so that they have an end-of-life plan first.

Comment 10:
Name: Joe Walcott
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Rather than exporting or outsourcing waste, there needs to be an actual reduction in waste

Comment 11:
Name: John Davis
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Work with people who design curbside processing systems, commingled systems, etc. to learn what is feasible for infrastructure and permitting (e.g. permitting waste transformation facilities and maximum feasible recycling and composting requirements). Include both climate impacts and human impacts in any LCAs. Oregon has LCAs to look at. LCAs are useful but can be manipulated so be careful on what is used/shared. Regulate industry. There are examples of industry driven solutions in the past (cans, newspaper in cardboard). Look at the 1993 market development plan that CalRecycle inherited for any gaps.

Comment 12:
Name: John Kennedy
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: It will be hard to get to 100% if that's the goal. Focus on reuse, reduction and education instead of the last 5-10% which are residuals. Use education and outreach to motivate the public rather than penalties. Acknowledge the costs, capacity, and diversity issues for local jurisdictions. Address gaps that make zero waste efforts more costly and less effective (e.g. AB 939 and SB 1383 framework differences compared to SB 54 where manufacturers are invested). Look beyond single use packaging and foodware. Work with EPA and the manufacturing community. More engagement and work with other parts of the waste stream.

Comment 13:
Name: Julia Levin
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Focus on organic waste as a strategy to fight climate change. Work with sister agencies for bioenergy, compost and other alternatives to landfilling. Market development is important. Update ARB calculation of avoided emissions and give more credit to projects that provide alternative solutions. There are gaps in organics for woody and cellulosic waste. These need more funding; SB 1383 supports wood chips and mulch but we have enough of that (what about bioenergy?). Biosolids are best addressed through pyrolysis to get rid of PFAs. Examples from interagency collaboration (Clean Air Task Force report on building circular economy and clean energy development). Look at highest and best use.

Comment 14:
Name: Linnea Skierski
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Interagency collaboration will help with meeting goals. We will provide successful examples of zero waste planning in writing.

Comment 15:
Name: Margaret Suozzo
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: EPR/grants/incentives are needed for blue wrap recycling in health care systems – a reusable solution exists but is hard due to space constraints

Comment 16:
Name: Michael Siminitus
Date received: 8/14/24
Source: Workshop

Attachment(s): N/A
Comment: Look at Zero Waste definition as a spectrum, restore damage through regenerative measures. Interagency cooperation should focus on permitting and funding. Build more capacity for organics. More bioremediation, carbon sequestration, working with CARB for offset credits. More funding for higher value, reuse, repair businesses so they can scale up and become cost competitive. Financial support is needed for reuse infrastructure, it is not cost competitive otherwise.

Comment 17:

Name: Nick Lapis
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Suggest ZWIA definition for zero waste, something to measure towards. Address edible food recovery plan and analysis of transitions away from transformation as directed in Budget Act. Look at regeneration, soils in LCAs and attribute benefits to soil. Consumption based inventories are a good tool that show the impacts upstream and downstream. Oregon DEQ has done lots of LCAs.

Comment 18:

Name: Phoebe Schenker
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Funding analysis in recommendation 2 is a critical part of plan. Support reuse systems in the way recycling systems have been supported, short term investments lead to long term economic benefits.

Comment 19:

Name: Richard Ludt
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Better enforcement and oversight needed (we are the only 3rd party verified recycling facility in So Cal). Get rid of ADC/beneficial reuse loophole. Include C&D waste.

Comment 20:

Name: Roseanne Stempinski
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Work with local zero waste communities practicing zero waste; it's hard and would be good to tap into their business networks and solutions

Comment 21:

Name: Sheng Su
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Highlight technology that converts agricultural waste to new products. We need more manufacturing machines to create products out of organic materials. Making products from agricultural waste benefits all.

Comment 22:

Name: Shira Lane
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Plan for reuse infrastructure. Have better regulation and live data on labeling. Providing economic opportunities for both urban and rural areas is equitable. We need education on waste reduction in schools. Work with cleaning/janitorial companies, they are not as educated about sorting. Include funding for community organizations and non profits. Educate new companies to think about circular economy.

Create a mindset shift to make reuse cool. Support fix it centers. Support creative endeavors (e.g. reuse of chlorine for pools).

Comment 23:

Name: Stephanie Barger
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Set standards and goals. Break up franchise agreements. Make it flexible to have a commodity plan for all materials, and source separate them. Look outside of US for good examples (Chile has strong producer responsibility). Focus on market development - let's manage materials not waste. Keep standards high and enforce compliance (no one-bin systems). Highlight the economic benefits (Toyota savings example). Make companies and communities more efficient. Eliminate excess packaging. More green jobs in reuse and repair.

Comment 24:

Name: Tedd Ward
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Cleanups will reduce biodiversity, so waste prevention strategies are better. Reuse and repair industry provides more jobs than recycling or composting. More support for companies that are directly affiliated with recovery systems, companies, and products, or have take-back capabilities in their facilities. Eliminate subsidies for extraction and virgin materials. Use ZWIA definition of Zero Waste. Composite materials have zero recovery potential. Identify service voids where no collection or recovery opportunities. Create clear guidelines on labeling, enforcement for violations to reduce confusion and contamination. Support reuse and repair. US should support UN efforts to control and reduce expansion of plastics production. Design products to move away from toxics or flammables. Science based policies (e.g., methane leakages around fracking and dairy related emissions are substantial). C&D recovery is one of the biggest opportunities for recovery (service void).

Comment 25:

Name: Tim Mawson
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Open up grants beyond local government and Tribes to provide small businesses with opportunities to reuse (e.g. harvest wood for reusable lumber before it is ground into chip). Reuse of lumber, create more opportunities through education.

Comment 26:

Name: Xinci Tan
Date received: 8/14/24
Source: Workshop
Attachment(s): N/A
Comment: Interagency collaboration related to:
Focus on carbon sequestration in climate action plans
Blue carbon - carbon capture by oceans and coastal ecosystems
Permitting of new organics processing facilities.
More local production, repair and reuse of textiles and clothing (outsourcing of textiles is tied to EJ issues)

Comment 27:

Name: Christopher Otoshi
Date received: 8/14/24
Source: Email (**Christopher.otoshi@sfgov.org**)
Attachment(s): No
Comment:
Dear CalRecycle Zero Waste Workshop Board,

Striving for Zero Waste will require the prioritization of waste generation reduction and reuse. CalRecycle historically supported the development of recycling markets via its Recycling Market Development Zone Program (**RMDZ**). To make the shift to reuse, there should be a comparable program for the development of reuse infrastructure.
Additionally, when discussing reuse infrastructure in California, we cannot forget about building materials coming from the construction and demolition industry as it makes up nearly 50% of the waste generated. I currently see this as a gap in the world of Zero Waste.
To achieve “Zero Waste”, it is essential that CalRecycle support the development of facilities that will specialize in the recovery and reintegration of building materials. Our research in San Francisco has shown that absence of a reliable supply of reused building product is the main barrier preventing building material reuse. This barrier can be addressed with increased storage space for these materials that can be brought about via specialized infrastructure to store and process salvaged building materials. However, we have found it extremely difficult to support the development of this infrastructure on our own.
Another important piece of this equation is supporting a shift in construction practices from traditional demolition that renders many building materials useless and unrecoverable even when they hit recycling sorting facilities to practices like deconstruction that will ensure a systematic dismantling of a building, leaving material intact and able to be recovered and reused in another construction project.
Prioritizing a shift for deconstruction and building material reuse offers a whole slew of environmental and economic co-benefits, one being landfill preservation as many construction materials, including furniture, currently do not have stable recycling markets, but have reuse markets.
Thank you for your consideration.
Chris Otoshi | **Building Materials Management Specialist**
San Francisco Environment Department
1455 Market Street, Suite 13B
San Francisco, CA 94103
christopher.otoshi@sfgov.org
P: (415) 355-5018
Pronouns: he, him, his

Comment 28:

Name: Phoebe Schenker
Date received: 8/15/24
Source: Email (**phoebe@reusealliance.org**)
Attachment(s): Yes
Comment:
Dear CalRecycle
Thank you for engaging with the public so willingly in this critical plan for California’s zero waste future. We look forward to more opportunities to engage as the circular economy is such a critical component of this plan. The Baseline Report is filled with valuable data that would be helpful if CalRecycle made public every year.
The following are our comments on the report recommendations so far.
Recommendation 1:
Existing programs need to be evaluated for reuse opportunities. For example, SB1383 does not currently allow funding to be used for reclaiming wood and other organics (Although hopefully AB2346 will adjust that). The Electronic Waste Recycling Act of 2003 should fund testing/repair/refurbishment programs not just recycling.
Recommendation 2:
We are happy to see ‘identifying a sustainable funding model’ in this recommendation
(ideally it would be its own recommendation as it is so critical). We encourage CalRecycle to look broadly at funding models and to think outside the box by looking at increasing tipping fees, augmenting waste jurisdiction funding, labor taxation, incentives, permitting, subsidies, public private partnerships, and EPRs. We need to invest in reuse infrastructure, at least equal to what we have invested in recycling, in order to reach a truly circular economy.
Recommendation 3:
A critical component of circularity is repair and maintenance, and this should be included here. There is much that CalRecycle can do from supporting local repair efforts to learning from examples like France’s textile repair subsidy. At a single Repair Fair in just a few hours we can educate 150-200 people, repair 50-

100 items, divert 500-800 lbs from the landfill, and avoid 4,000 - 7,000 kg CO2e. If we scaled our program statewide to all 58 counties we could divert half a million pounds from the landfill each year, while providing valuable education about other reuse resources and programs.

Recommendation 4:

Reuse should be seen as an asset, not a burden and usually does not come with the environmental impacts of recycling. Furniture Bank organizations like Make it Home Bay Area and Humble Design demonstrate that reuse can be harnessed to provide for some of our most vulnerable and disadvantaged populations if we can work with the departments that provide housing and services to incentivize reuse.

Recommendation 5:

The circular economy does not 'reduce the need for new infrastructure', rather it changes the type of infrastructure needed. Reuse requires reverse logistics, maintenance and repair infrastructure, and processing of reusables (ie washing) infrastructure to name just a few. Digital infrastructure is also required, and California could be a leader in the roll out of reuse inventory software, tracking systems, emissions calculators, online marketplaces and more.

Reuse is a potentially huge source of green job training and is an opportunity for partnerships with other agencies to develop programs that provide meaningful employment for Californians of all backgrounds.

Recommendation 6:

Redesigning products for durability (through requiring performance standards) and repairability over design for disassembly and recycling.

Develop markets for reuse and remanufacture ahead of recycling.

While the content of these recommendations is sound, there is some overlap and confusion in the details. We would clarify them as follows:

Recommendation 1 - Achieve existing regulation/program goals (enforcement, efficiency evaluation, etc.)

Recommendation 2 - Identify gaps and overlaps in existing systems/regulation/programs.

Recommendation 3 - Analyze existing economic/funding model and evaluate revisions/alternatives.

Recommendation 4 - Identify and combat environmental health and justice issues

Recommendation 5 - Maximize Social and economic benefits of a circular economy.

Recommendation 6 - Stimulate growth of the state's circular economy through activities such as:

a. Redesigning products to performance standards.
b. Implementing infrastructure that reduces waste and enables reuse.
c. Developing markets for reused, remanufactured, and recycled materials.

Thank you again for all your work. Please don't hesitate to reach out if we can provide further information or insights.

Sincerely,
Phoebe Schenker
Executive Director
Reuse Alliance

Comment 29:

Name: Leonard Robinson
Date received: 8/16/24
Source: Email (**I.Robinson@sustainable-env.com**)
Attachment(s): No
Comment:

My name is **Leonard Robinson**. I serve as Partner/Sustainability Strategist for the **Sustainable Environmental Management Company (*SEMCO*)**. Previously I served as Acting Director and Chief Deputy of the Department of Toxic Substances Control (DTSC). I attended the Zero Waste Plan Workshop (*virtually*) on Wednesday, August 14th.

My comments reflect Recommendation #6:

Stimulates growth of our state's circular economy through activities such as:

- Redesigning products for easy reuse or recycling
- Implementing infrastructure that reduces waste and enables reuse
- Developing markets for recycled materials

I would like to share a success story in 1991 that involved CalRecycle's predecessor the Integrated Waste Management Board (IWMB) and DTSC regarding the management of used oil filters that may still exist in CalRecycle archives.
In 1990, the USEPA Office of Solid Waste & Emergency Response (OSWER) sent out a memo regarding the management of used oil filters (UOFs) detailing a path how the UOFs would fit in the scrap metal exemption and would NOT be a federally regulated waste.
In California, waste oil and waste oil contaminated material were considered state regulated hazardous waste which meant the UOFs would have to be manifested and disposed of at a Class I Facility.
TAMCO Steel, located in Rancho Cucamonga, was the only steel mill in California. The TAMCO process consisted of melting scrap steel in an electric arc furnace to make steel reinforcing bar (rebar) for the construction industry. TAMCO melted approximately 500,000 tons of steel scrap per year.
The original thought was that TAMCO would recycle the UOFs in its process as steel was the primary material in them. However, because UOFs were state regulated hazardous waste, TAMCO would be required by the State of California to obtain a TSD permit to recycle them, which was cost prohibitive. A meeting was convened at TAMCO which was attended by representatives of: IWMB, DTSC, South Coast Air Quality Management District (SCAQMD), San Bernardino County-Hazardous Materials Management Division, CalOSHA and TAMCO. A plan was developed that would allow TAMCO to recycle used oil filters without obtaining a TSD permit. The plan was later codified as **California Health and Safety Code (HSC), chapter 6.5, division 20, article 13 §25250.22**, and **California Code of Regulations title 22, division 4.5, (22CCR) §66266.130**.

- A diversion path was created for the recycling of UOFs
- More used oil was captured and recycled
- TAMCO paid a fee for UOFs delivered
- A UOF processing equipment market was created
- TAMCO received high grade scrap steel
- Filter manufacturers reduced the amount of lead in the filter to make more attractive to recycle this reducing lead in commerce

Later, I approached DTSC about the possibility of adding NiCad batteries to TAMCO's steel-making process. A formula was developed to reduce the nickel in the batteries into the steel. Nickel is used in the steel-making process to increase the strength of steel and there was a worldwide shortage of nickel at the time. The cadmium would pass through, cool down and get captured in the air pollution control device called a baghouse. The baghouse is calibrated to capture lead, zinc and cadmium that appears in the scrap melting process.
Cadmium is a RCRA waste, however RCRA also allows exemptions for recycling. DTSC's response was that it was "reclamation" not "recycling". therefore requiring a RCRA permit (*which I guess is government-speak for "hell no!"*). A permit was cost-prohibitive. It made more financial sense to pay inflated costs for nickel in an unstable market.
My point is that the government and industry got together at the table to provide solutions and discuss arbitrary decisions and narrow interpretation that have prevented landfill diversion goals. I am sure that there have been other instances where the policy to protect the environment prevents the environment from being protected through narrow interpretation and arbitrary regulatory decisions.
Other successful waste diversion programs implemented by TAMCO in the 1990s included processing steel-belted tire cords and confiscated firearms in the steel-making process.
I encourage CalRecycle to check its and DTSC archives for past successful recycling stories and more importantly for ones that did not succeed due to narrow regulatory interpretation and/or arbitrary decisions.
If there are any questions, please feel free to contact me.
Sustainably
Leonard Robinson
Partner/Sustainability Strategist
SEMCO
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Comment 30:
Name: Sheng Su
Date received: 8/16/24

Source: Email (**susheng2009@gmail.com**)
Attachment(s): Yes, Non-text items incorporated into documents submitted to CalRecycle are not reproduced here
Comment:
I am pleased to submit this white paper as part of submission for CalRecycle Zero Waste Plan workshop. Below, we present an overview of our waste disposal initiatives and plans, which demonstrate our robust commitment to environmental sustainability and innovation in waste management:
Waste Disposal Initiatives
Paradigm Shift: Recognizing waste as valuable resources. Utilization of Waste for Fertilizer, Feed, Raw Material, and Biobased Products.
Comprehensive Classification: Unlocking waste potential across sectors.
Circular Economy Framework: Maximizing utilization of every waste type.
Innovative Solutions: Developing advanced machinery for diverse waste disposal needs.
Future Plans
Industrial Development: Innovating and extending the development of large-scale machinery and equipment manufacturing, along with the complete supply chain industry.
Developing Insect Industrial Product Technology and Insect Farm Manufacture Technology: Focusing on clearance of contaminating compost, disposal of mixed garbage contaminating waste conversion, and production of animal feeds, black leaf worms, worms, and vermicompost fertilizer.
Zero Waste Mission: Enhancing safety and efficiency through cutting-edge technologies for managing tank waste.
Sustainable Agriculture: Integrating vertical farming techniques, aquaculture, and animal husbandry for reduced food production costs and sustainable urban development.
Circular Economy Advancement: Preparing technology and strategic planning for the next stage of circular economy to achieve food security, especially in harsh climate environments.
Development of advanced electric motors and eco-light products and complete supply chain industrial for the circular contemporary agriculture and urban agriculture industry.
Tank Waste Strategies and Technologies: Comprehensive Waste Stream
Management:
Our Tank Waste Strategies and Technologies adopts a holistic stance in managing various waste streams, categorizing them into two primary categories: organic and urban waste sources. Organic Waste: 1. Agricultural Residues: These encompass crop remnants, animal manure, and byproducts stemming from agricultural operations.2. Food Waste: Covering discarded food items and organic materials originating from households, restaurants, and food processing establishments.3. Biomass: We efficiently handle organic matter sourced from plants, trees, and other potential energy production sources. Urban Waste:4. Municipal Solid Waste (MSW): Our system adeptly addresses the prevalent household and commercial waste generated in urban settings.5. Urban Underground Sewage: We pay meticulous attention to the often overlooked yet crucial domain of urban underground sewage waste.6. Marine Life and Fishery Debris: We inclusively consider waste generated from marine life and fishery activities, thus completing our waste management scope.
Principles and Fermentation Process: Our methodology leans on established bio-material fermentation techniques, leveraging substances like rice water, milk water, and sugar residues to cultivate liquid fertilizer and microorganisms. Precise temperature and moisture control optimize organic waste breakdown, expediting the composting process.
Customized Nutrient Formulations: Our tailored nutrient formulations for organic fertilizers and animal feed are meticulously crafted, guided by thorough soil analysis and specific crop nutrient demands. These formulations encompass vital elements like carbon, nitrogen, potassium, calcium, iron, phosphorus, and specialized nutrients crucial for animal health, fermentation, and agricultural prosperity.
Fermentation Process: The fermentation process is a crucial component of our waste conversion system. It involves temperature-controlled stages, including low temperature, high temperature, and cooling, all aimed at ensuring the effective breakdown of organic waste and the safe composting of materials.
Microorganisms in Odor Reduction: One of the key aspects of our waste management approach is the use of diverse microbial strains to reduce odors.
These microorganisms specifically target compounds such as H_2S and NH_3, thus ensuring compliance with emission standards and minimizing unpleasant odors associated with waste processing.

Ventilation and Odor Treatment: Our equipment is designed to be fully enclosed, and odors are efficiently treated using microbial action.
Continuous monitoring is in place to ensure odor control and a fail-safe mechanism is integrated to address any unforeseen issues promptly.
1. Effective Processing: Utilizing existing machinery innovatively for efficient waste processing. Our industry-engineered system is capable of handling up to 2000 tons of waste with a variety of machinery sizes. This includes a fully enclosed system for conversion within 20 hours less, and the utilization of organic waste for converting various waste streams into useful products, including organic fertilizers.
2.Effective Processing: Utilizing existing machinery innovatively for efficient waste processing. Our industry-engineered compost system, capable of handling up to 2000 tons of organic waste, features a fully enclosed system for conversion within 24 hours. This system reduces the burden of landfills by converting various waste streams into useful products while ensuring no contamination of compost.
Nutrient-Enriched Animal Feed Production:
3. Effective Processing: Utilizing existing machinery innovatively for efficient waste processing in fermentation-cooked food product systems. Our industry-engineered system, reaching up to 2000 tons, features a fully enclosed system for the conversion of food waste within 2 hours. This process produces fortified feed enriched with bioactive compounds, addressing global food security and environmental concerns while promoting healthy growth.
Precision and Innovative Framework: Cutting-Edge Equipment: Utilizing advanced machinery for waste conversion, including horizontal fermentation tanks, belt conveyors, spray towers, and deodorization systems. Our technology extends beyond tank strategies; for instance, in the 2000-ton capacity, we design underground cave spaces to maximize energy utilization, space, and production process conditions, thus enhancing waste management efficiency and effectiveness, saving power, and reducing costs. We will apply national intellectual property Patented Processes to transform waste into environmentally conscious products.
Developing New Technologies and Innovative Machinery for Waste Management:
1. Innovative Conversion of Agricultural and Forest Waste into Renewable Construction Materials Machinery, Equipment, and Bio-Technologies. Our development focuses on the elevated dynamic processing of circular industrial green construction products, including magnesium oxide boards (MGO plates), fire-resistant decorative boards, grass doors, wall plates (sandwiches), ventilation pipe boards, and roof tiles.
2. Innovate Waste Plastic Products, Waste Plastic Bottle Conversion Machinery and Equipment: Transforming waste plastic products and waste plastic bottles into toys, household stuffing, and chemical fiber, promoting recycling and reducing plastic waste. Apply the existing technology of five plastic bottles to make one T-SHIRT.
3. Innovate Biodegradable Straw Machinery and Equipment: Develop industrial equipment that processes agricultural residues, and breaks rice, break corn, break cassava into compostable straws as eco-friendly alternatives to plastic.
4. Innovate Biodegradable Compost Disposal Used Tableware and Food Packaging Machinery: Developing machinery to manufacture compostable disposal used tableware from agricultural waste, contributing to the utilization of sugarcane waste.
5. Innovate Waste Cardboard boxes and waste Paper Products Conversion Machinery: Creating eco-friendly egg trays and packaging products from paper pulp, reducing reliance on non-biodegradable materials.
6. Innovate Bio-Active Charcoal Stove Machinery: Utilizing all kinds of nutshell waste for valuable products like activated carbon. Develop activated charcoal, potash fertilizer, food additives, and additives for cosmetics and daily necessities.
7. Creative Microorganism Fermentation Equipment: Converting various waste materials into organic liquid fertilizers, along with necessary materials such as waste rice bran and wheat bran necessary for bio-compost and animal industrial processes. Mitigation Strategies: Addressing specific pollution challenges effectively with machinery and equipment. Case Studies demonstrate the effectiveness of technology in environmental conservation.
8. Our technologies target pollution challenges and address contamination in soils, water bodies, and coastal areas. Our processing machinery and equipment effectively dispose of organic waste, including shellfish poisoning, harmful algal blooms, kitchen food waste, excess salts and edible oils, animal carcasses, and marine pollution.

We leverage natural humic acid through innovative biotechnology, playing a crucial role in mitigating heavy metal toxicity and enhancing soil health.
This multifaceted approach contributes to sustainable pollution control.
Biochar serves as an effective organic pollutant adsorbent, reducing agricultural organic pollution. We consider site-specific conditions to optimize its effectiveness in reducing bioavailability. Our high-efficiency deodorizing microbial strains collaborate to break down and neutralize odorous compounds effectively. Their roles and contributions are outlined to ensure comprehensive odor reduction.
Strategic Collaborations: We have established strategic partnerships with esteemed entities such as Advanced Biofuels and Bioproducts Process Development Unit (ABPDU), as part of the Lawrence Berkeley National Laboratory (LBNL), is a DOE-funded facility to facilitate the bio-economy and lead scientists and engineers in the field of waste management research and development. Through these collaborations, we exchange valuable expertise and resources to advance our shared goals of promoting environmental sustainability and innovation. Our partnership agreements include strict confidentiality clauses to safeguard proprietary information related to waste transformation methods, zero waste strategies, and circular economy models. By leveraging the collective knowledge and capabilities of our partners, we accelerate progress toward achieving our waste management objectives while ensuring the protection of sensitive business information.
We believe that our expertise and initiatives are well-suited to contribute to the objectives of the CalRecycle Zero Waste Plan Program.
Best
Sheng Su
CEO of Sustain You
Green products from reusable waste

Comment 31:

Name: Gary Liss
Date received: 8/20/24
Source: Email (**garyliss4395@gmail.com**)
Attachment(s): No
Comment:
Thank you for organizing last week's meeting on developing the California Zero Waste Plan. I understand an incorrect statement was made that there is no internationally accepted definition of Zero Waste.
I am the Chair of the Zero Waste Certifications Committee of the Zero Waste International Alliance (**ZWIA**). ZWIA was formed in 2002 to develop standards to guide the development of Zero Waste in the world. In 2004, ZWIA adopted its first definition of Zero Waste. That **definition was refined in 2018** after an extensive peer review process by the world's leading Zero Waste advocates. That definition and examples of how it has been used are in a letter to you **linked here**.
ZWIA urges CalRecycle to adopt or recognize this international definition of Zero Waste as soon as possible to guide the development of the California Zero Waste Plan. This will ensure that the Plan focuses on how to achieve real Zero Waste.
I'd welcome the opportunity to discuss this with you and your staff at your earliest convenience.
Gary
Gary Liss
916-335-1637 (cell)
garyliss4395@gmail.com

Comment 32

Name: Michael Tschantz
Date received: 8/21/24
Source: Email (**Michael.tschantz@ingevity.com**)
Attachment(s): Yes
Comment:

As a manufacturer of industry-leading biodegradable polymers for compostable packaging solutions, Ingevity is committed to developing solutions to maximize the benefits of compostable packaging and create a zero waste future. Ingevity is a world leader in polycaprolactone technology and innovation, with a 50-year history of helping compounders and converters produce higher-performing certified compostable

plastics. Our company has actively advocated worldwide to increase access to organics recycling and offer solutions to regulators and legislators looking to fight climate change.

Ingevity appreciates the opportunity to comment on recommendations from the Baseline Report for the Zero Waste Plan. We provide direct feedback below on the questions posed by CalRecycle for public comment and offer additional comments on the Baseline Report.

How does Recommendation 1 help drive us towards zero waste in California? Do you have specific examples of where these efforts have been successful? Or examples of challenges?
Ingevity supports the state's goal of achieving and exceeding existing waste and emission reduction mandates and goals. Ingevity suggests CalRecycle look to certified compostable packaging to further reduce emissions and waste. For food contaminated packaging, certified compostable packaging offers the best pathway to reducing waste and emissions since it can be diverted to industrial composting facilities or home/community compost piles and effectively prevent potent landfill methane emissions. Certified compostable packaging diverts additional food waste, reduces contamination, and unlike conventional packaging products, will not create persistent microplastics in the compost[1]. The Zero Waste Plan should evaluate how to incentivize the use (by consumers) and processing (by composters) of certified compostable packaging in applications that cannot be reasonably shifted to reuse or be mechanically recycled across California.

How does Recommendation 2 help drive us towards zero waste in California? Do you have specific examples of where these efforts have been successful? Or examples of challenges?
Ingevity supports the recommendation to identify and address gaps in current waste management systems. We recommend this plan specifically look to address the unfortunate reality that few composters in California are willing to process certified compostable material. Their inability to process certified compostable products will hold California back from reaching its ambitious climate and zero waste goals. The Zero Waste Plan should analyze the potential benefits of California switching its food contaminated packaging from conventional to certified compostable and create a strategic plan to work with composters and packaging producers to ensure certified compostable packaging is processed across the state.

How does Recommendation 6 help drive us towards zero waste in California? Do you have specific examples of where these efforts have been successful? Or examples of challenges?
Ingevity supports this recommendation and recommends the Zero Waste Plan analyze how to incentivize the redesigning of conventional food contaminated packaging into certified compostable packaging. California has the opportunity to be a leader for innovation in sustainable packaging and could attract more investment if they choose to be bold and quicken the transition away from conventional packaging products which when contaminated with food are often not able to be recycled and are subsequently landfilled.

We also recommend the Zero Waste Plan analyze developing markets for composters who process certified compostable material. Many types of food contaminated packaging will likely not be recyclable and will need be transitioned to certified compostable formats under SB 54. While there's been plenty of investment and research into developing markets for unwanted recycled material, there has been a lack of investment into developing a plan for how composters in California can process certified compostable material and make a reasonable profit while fighting contamination from conventional plastic products.

General Comment
Ingevity recommends the Zero Waste Plan focus on the use of certified compostable packaging. We are disappointed the Baseline Report does not provide any insight on the current use or potential for certified compostable packaging. Furthermore, the EPR section of the report is inaccurate as it omits the fact that packaging and plastic food waste must be recyclable **or compostable** by 2032. Currently, the report says it must be recyclable which is not consistent with S854 which also allows compostable solutions, which can be ideal when recyclability is not feasible. While the Baseline Report has a strong focus on organic waste diversion and packaging, we recommend the Zero Waste Report include an analysis of the use of certified compostable packaging and how it can help California achieve its zero waste goals.

If you have any questions regarding Ingevity's positions as set forth in this letter, or need additional input, please contact me at michael.tschantz@ingevity.com.

Sincerely,

Dr. Michael F. Tschantz

Vice President, Government Relations

[1] **Compostable Packaging Lowers Contamination at Restaurants (waste360.com)**

Comment 33:

Name: Greg Shipley
Date received: 8/23/24
Source: Email (**greg@bioenergydesign.com**)
Attachment(s): Yes, Non-text items incorporated into documents submitted to CalRecycle are not reproduced here
Comment:
To Whom it May Concern at CalRecycle:
6. Stimulates growth of our state's circular economy through activities such as: • Redesigning products for easy reuse or recycling. • Implementing infrastructure that reduces waste and enables reuse. • Developing markets for recycled materials
This is an important factor in the State's efforts to make AB 939 (for starters) more efficient; especially considering the Chinese "Green Wall" policies that have so adversely affected the Recycling Commodity Markets. This 6th Goal incorporates several things that CalRecycle, as well as CARB, CEC and other agencies need to be on the same page, when it comes to imagining how recycled materials can actually be processed and converted into new products.
This concept entails, first, a review of the definitions within current codes that classifies Pyrolysis and Gasification within the "Incineration Category". Especially Pyrolysis, which is "oxygen starved" and does not involve a "flame", which is the way that incineration technologies actually dispose of waste.
Pyrolysis, on the other hand, is "High Heat … in the Absence of Oxygen" and thus deconstructs waste into a molecular format with a carbon by-product (Biochar, Activated Carbon or Carbon Black pigment) and a Synthetic Natural Gas ("Syngas" – which can be further refined into biofuels, biochemicals and electric power, for starters). This is in keeping with the California mandate to divert "organic waste" from landfills and into "organically-produced oils" delivered to California Fossil Fuel Refineries to further process into a "Very Low-Sulfur Marine Fuel", a "Drop-in Renewable Diesel" (as opposed to a F.O.G. transesterification process to a "Biodiesel), and a "Drop-in Sustainable Aviation Fuel" (SAF – as opposed to a Fats/Cooking Oils/Grease [F.O.G.] that must be blended with fossil Aviation Fuel).
So … the State of California needs to do the minimum effort of restating definitions contained in CalRecycle, California Energy Commission, California Air Resources Board and other regulatory agencies (as applied) to distinguish between these different "thermal technologies". Then, and only then, can the State of California proceed to examine the advantages of "Conversion Technologies" to their fullest extent and smartly recycle valuable California Waste Resources to their highest value and produce "beneficial products" … right here in California or elsewhere.
The old axiom was to recycle OCC, paper, plastics ***into new*** cardboard, paper and plastics (just like recycled aluminum, glass and other metals). These old concepts must be thrown out and rethought as to what actually constitutes "recycling"! If you take those same materials and instead of "plastic regrind" going in at a smaller percentage to make new plastics … "deconstructing those materials into the molecular format" can be used to produce entirely new products WITHOUT RESTRICTIONS … which is a more advantageous "market-oriented" solution to recycling.
Regards,
Greg Shipley

Comment 34:

Name: Paul Bennett, Jr.
Date received: 8/23/24
Source: Email (**pbennett@respsco.com**)
Attachment(s): No
Comment:
To whom it may concern,
In regards to your most recent email for suggestions about circularly economy here below is something that is a win-win for California.

The public schools, universities, prisons, etc. that CA state governs uses companies like Sysco that have products in their distribution centers that are ordered by the school, colleges, universities, prisons, etc. Instead of having their orders shipped on wood pallets to the state distribution centers have the products shipped on plastic slip sheets made from 100% post- industrial / post-consumer HDPE (high density polyethylene) recycled resin have the order products shipped on plastic slip sheets.
YOu say why?
The true logic is the green to gold concept. The distribution center saves the slip sheets and when there is sufficient quantity (10,000 lbs to 40,000 lbs) ship those used slip sheets back to our plant in Riverbank (Modesto area) where we take those used slip sheets and blend them in (grind up) and manufacturer NEW slipsheet. Plus the fact that and Repsco pays whomever the government agency is $**.20 a pound.** Which sounds like not very much money but look at your cost of these state-run facilities in their allocation of funds for wood and /or plastic pallets. If they were having their orders shipped on plastic slip sheets instead of wood pallets the cost differences is at least 35% and in some cased 50%.
We have one customer who orders over 1 million pounds a year of slip sheets instead of using wood pallets to ship their products to distribution centers. We allocate $200,000 to them if all 1 million pounds of used slip sheets are returned to our plant.
Basically this is a true circular economic and environmental benefit for the state as it works toward its ESG goals.
IF you would like additional details, please let me know.
Paul Bennett, Jr.
Repsco, Inc. **(since 1971, Veteran owned, VA certified business 3/12/2019**)
A Custom sheet extrusion manufacturer of ***100% recycled HDPE & PP***
Manufacturing in CA since 2011: 5300 Claus Rd., Bld. 2, Riverbank, CA 95367
www.repsco.com
www.slipsheets.com
303-294-0364 x 101
303-294-9054 (fax)
303-883-1667 (cell)

Comment 35:

Name: Thomas Helme
Date received: 8/26/24
Source: Email (**tom@VIP209.org**)
Attachment(s): No
Comment:
Months ago VIP had planned our 2-day Strategic Planning retreat for today and tomorrow so we unfortunately won't be able to attend this event. As a general comment, I think we need to prioritize investment in ZW pilot projects and infrastructure (re-use/refill systems, repair workshops, etc.) in communities that have been burdened by incinerators and landfills.
Obviously we are also against utilizing any type of polluting facility/technology (pyrolysis, waste-to-hydrogen, chemical "recycling"), especially in disadvantaged communities, to manage waste.
I hope there will be another one of these listening sessions and the sooner I can put it in our calendar the better. Thanks for reaching out and look forward to being part of this important discussion on EJ and ZW. - Tom
Thomas A. Helme | Co-Founder
Valley Improvement Projects (VIP)
Office | 1224 K St. Modesto, CA 95354
Cell | (209) 324-6414

Comment 36:

Name: Julia Levin
Date received: 8/30/24
Source: Email (**jlevin@bioenergyca.org**)
Attachment(s): Yes
Comment:
Dear Director Heller:

The Bioenergy Association of California appreciates the opportunity to submit these comments on the Zero Waste Plan workshop held August 14. While achieving zero waste is a laudable goal, BAC urges CalRecycle to focus on the most urgent needs, which are to reduce landfilling of organic waste as required by SB 1383 and to increase landfill gas capture and use. Nothing is more important for the climate or public health than reducing methane and other VOC emissions from landfills.

BAC represents about 100 members that are converting organic waste to energy to meet the state's clean energy, climate change, wildfire reduction, landfill reduction, and clean economy goals. BAC's public sector members include cities and counties, Tribes, air quality and environmental agencies, waste and wastewater agencies, public research institutions, environmental and community groups, and a publicly owned utility. BAC's private sector members include energy and technology companies, waste haulers, agriculture and food processing companies, investors and consulting firms, and an investor-owned utility.

BAC's responses to specific questions posed at the workshop are below.

How to Reach or Surpass Existing Waste and Emission Reduction Mandates and Goals.

As noted above, the most urgent mandate is the 75 percent organic waste diversion requirement of SB 1383. Organic waste that is landfilled emits methane, a climate super pollutant that is 84 times more damaging to the climate than carbon dioxide on a 20-year time basis. Given the rapidly accelerating pace of climate change, there is nothing more urgent than reducing methane and other SLCP emissions.

As the director of the United Nations Environment Program stated, "cutting methane is the strongest lever we have to slow climate change over the next 25 years and complements necessary efforts to reduce carbon dioxide. . . We need . . . to urgently reduce methane emissions as much as possible this decade." The United States and the European Union have also issued a Joint Statement saying that the reduction of methane "is regarded as the single most effective strategy to reduce global warming in the near term and . . . Methane abatement delivers additional important benefits, including improved public health and agricultural productivity." The California Air Resources Board has also recognized the urgency of reducing methane and other SLCPs, stating that "the science unequivocally underscores the need to immediately reduce emissions of short-lived climate pollutants (SLCPs)."

The Zero Waste Plan should identify the specific steps needed to achieve the 75 percent diversion requirement of SB 1383. Those steps should include:

- A timeline and date certain for achieving 75 percent organic diversion, as it clearly will not be achieved by the legislative deadline of 2025.
- Identification of markets and steps to accelerate development of those markets for the procurement products allowed under CalRecycle's regulations.
- Identification of additional procurement products, including pipeline biomethane, hydrogen, biochar, and Sustainable Aviation Fuels.
- Recognition of the permitting challenges that alternative products, including both compost and bioenergy, face and recommendations to address those challenges. The plan should acknowledge challenges for new compost facilities in some air districts due to methane and VOC emissions, the presence of PFAS chemicals, odors, etc. The plan should also acknowledge challenges for new bioenergy facilities, including CEQA, air and other permitting delays, conflicting regulatory codes, unclear state and federal definitions of different technologies, etc.
- Specific plans for the use of cellulosic or non-digestible (biomass) waste, including plant waste and the increasing amount of wildfire debris, that include identification of barriers to their use.
- Identification of conflicting code sections that make biomass utilization more difficult and recommendations for changes to those code sections.
- Suggestions for funding options for infrastructure needed to process diverted organic waste.

Identifies and Addresses Gaps and Overlaps to Make Current Waste Management Systems More Sustainable, Effective, and Cohesive.

For organic waste, the biggest gap is a strategy to address non-digestible waste, including woody waste, wildfire debris, construction debris, etc. The waste code includes a number of definitions and requirements that make it much more challenging to develop the alternatives to landfilling of biomass waste, and those sections and definitions need to be corrected. In addition, the proscription against, or CalRecycle's fear of, providing funding for projects that use gasification or pyrolysis must end.

California cannot achieve 75 percent organics diversion without significant investment in infrastructure for biomass waste. California does not need more wood chips or mulch – both of which, essentially, constitute

a fire hazard – when the state is already swimming in woody waste from agriculture, forests, and other wildfire mitigation efforts.

The Zero Waste Plan should identify and propose solutions to address:

- Scientifically incorrect definitions in the waste code, including the definition of "gasification," which was politically driven and is not consistent with the definition used by the California Energy Commission, U.S. Department of Energy, U.S. Environmental Protection Agency, or other expert agencies.
- Barriers to obtain and use funding for biomass conversion projects. CalRecycle incentives to date have focused entirely on digestible waste, which means that biomass diversion lags even further behind schedule than the digestible portion of organic waste.
- Consolidated and accelerated permitting needs for waste diversion projects. Public Resources Code already authorizes the use of a consolidated permitting process and CalRecycle should deploy this to accelerate and simplify project permitting for SB 1383 projects. Current timelines and conflicting agency requirements are making projects more expensive and more risky and ultimately delaying progress in landfill diversion.

Improves understanding of the full lifecycle of materials management (including each stage of the material lifecycle from beginning to end) to reduce loss and discourage disposal within a closed loop economy.

Understanding the full lifecycle is a critical issue and should be a major focus of the Zero Waste Report. This should include several factors:

- An accurate assessment of current landfill emissions, including leakage based on actual monitoring rather than outdated estimates of landfill emissions, so that the alternatives to landfilling are properly valued.
- A full lifecycle analysis of each of the procurement products allowed under SB 1383, including each product individually and when produced as a co-product.
- A comparison of the product to its alternative, including the use of compost in place of fossil fuel based fertilizers, the use of bioenergy in place of fossil fuels, the use of biochar for carbon sequestration and to reduce emissions from cement or dairy cows, etc.

Building a Healthy, Circular Economy

BAC applauds CalRecycle for its leadership in building a circular economy. This can provide many benefits for public health, the climate, good jobs and economic development. Achieving the true benefits of a circular economy, however, requires a full analysis of the benefits and impacts of each approach and a set of guidelines for prioritizing alternatives. Over-arching goals should include ensuring that projects maximize carbon reductions, provide significant reductions in local pollution, provide good jobs and local economic development, and more. To achieve a circular economy, it will be essential to define the goals.

Ensuring that the Zero Waste Plan helps achieve California's climate goals will require a full lifecycle analysis of the carbon emissions from landfills and each of the alternatives to landfilling. To determine whether projects are providing benefits for public health and the environment, CalRecycle should evaluate at least the following impacts and benefits to:

- Air and water quality, including impacts of trucking waste or its alternatives
- Soil, including long-term carbon sequestration, nutrients, water retention, and contamination from PFAS chemicals.
- Electricity reliability
- Low carbon fuels, including vehicle fuels, Sustainable Aviation Fuels, pipeline biomethane and hydrogen
- Types and duration of jobs created (temporary versus long-term, skilled or not, high paying or not, workforce training available, etc.)
- Benefits to local economies through job creation, investment in communities, tax revenues, benefits of reduced pollution.

Thank you for your consideration of these comments. BAC looks forward to continuing to work with CalRecycle to develop California's Zero Waste Plan.

Sincerely,

Julia A. Levin

Executive Director

Comment 37:
Name: Caleb Weaver
Date received: 8/30/24
Source: Email
Attachment(s): Yes
Comment:
Dear Ms. Heller,
We appreciate CalRecycle providing the opportunity to submit public comments to the Zero Waste Plan recommendations shared during the August 14, 2024 Public Workshop.
As a company dedicated to helping households reduce waste, Ridwell fully supports California's efforts to achieve a fully circular and zero waste economy. Since Ridwell's founding six years ago, our mission has been to help communities move toward a zero waste future, and we are eager to contribute to the successful development and implementation of California's Zero Waste Plan. Ridwell's entire business is founded on the idea that a significant percentage of American households are interested in doing more to reduce their waste. Our experience has shown that by coming at this challenge in a new and innovative way that meets people where they are and equips them with the information and tools they need, we can collectively begin to make a real difference. The State of California's leadership on achieving zero waste will drive change not only throughout the United States, but around the world, and we look forward to supporting this critical campaign to help save our planet.
As CalRecycle moves into the next phase of zero waste planning, we encourage you to explore and integrate innovative and non-traditional approaches to solving our waste challenges. While the traditional waste management industry will undoubtedly play a central role in this effort, the relatively small progress made toward achieving zero waste over the last few decades is not due to a lack of awareness or interest. When first implemented, the existing waste management structure and incentives resulted in steadily increasing recycling rates and participation. However, the **well-publicized stagnation** of diversion rates nationally over the last 15 years highlights the challenges of relying on a system designed to respond to an earlier set of policy mandates to achieve bold new zero waste goals. Even in California, as noted in the Baseline Report for the Zero Waste Plan, AB 341 set a 75% source reduction, recycling, and composting goal for California by 2020, yet despite some progress, the state's recycling rate has remained below 50% for the past decade.
Many of the long-term obstacles this Zero Waste Plan aims to address are challenging for a reason—they are difficult to overcome with the tools available today. Extended Producer Responsibility systems like SB 54 are an exciting and essential step that Ridwell strongly supports. However, as the very existence of this Zero Waste Plan effort suggests, progressive legislation such as SB 54 or SB 1383 alone will not enable us to achieve our ultimate goals.
Achieving zero waste in the near term will require embracing and encouraging fresh ideas and new industry players who can tackle these challenges in innovative ways. Rapid progress demands thinking beyond traditional approaches and welcoming diverse strategies to overcome these hurdles.
California has tremendous innovative capital, both human and financial, that can and should be leveraged to solve these challenges. Over the last few years, private sector entrepreneurs have shown strong interest in developing solutions, demonstrated by recent investments in creating more reusable or recyclable products, advanced sorting technologies that improve the economics of recycling, alternative collection methods for hard-to-recycle items, and public engagement tools to shift consumer behavior. However, we believe there is still massive untapped potential in the creativity and resources the innovation sector can bring to the table. By actively embracing and encouraging the development of innovative approaches and organizations through this Zero Waste Plan, the State of California has the opportunity to harness the state's unrivaled innovation economy in service of this fight.
Below are comments on the six recommendations and specific examples from Ridwell's experience that illustrate the potential of new approaches to advance these recommendations.
Recommendation 1: Achieve and exceed existing waste and emission reduction mandates and goals
Over the past five years, Ridwell's rapid growth has demonstrated that a meaningful percentage of the population is interested in going beyond the current waste reduction requirements, and is willing to invest their time and resources in doing so. While the most devoted elements of the zero waste movement has long been visible (especially online), Ridwell has grown to serve over 100,000 households for whom today's

barriers to a true zero waste lifestyle are too great, but who are willing to pay for a fully supplemental alternative collection service that requires source separation of the items in our program.
Based on the enthusiasm of our customers, we believe that leaning into exceeding the current waste reduction mandates will find significant support among the public - especially when households are offered the right combination of opportunity and engagement that meet them where they are. Stretch goals without the tools to make small but meaningful progress towards those goals are likely to be met with resistance or be ignored. However, we have seen how people are inspired to think harder, do more, and change their behavior when new, but achievable, goals are set.
We fully support establishing new goals that significantly exceed current mandates, while pairing the higher bar with enhanced services and opportunities that empower all parties, particularly the public, to actively support the effort.

Recommendation 2: Identify and address gaps and overlaps in current waste management systems to be more sustainable, effective, and cohesive.

As an alternative collection service provider helping households reuse and recycle items that are not fully covered by existing waste and recycling programs, we understand how the gaps and overlaps in the current system are both a challenge and an opportunity. An honest assessment of those gaps and overlaps is an essential step to creating a holistic system that is not only sustainable, effective and cohesive, but capable of achieving the zero waste goals at the heart of this Plan. The challenges posed by reusable and hard to recycle materials are very real, particularly when the tools that communities have available to responsibly manage them are limited by the highly regulated structure of today's waste management system.
More specifically, Ridwell continues to seek out partnership opportunities, both with traditional haulers and municipalities, to leverage our unique capabilities to enhance existing waste management programs beyond what our service currently offers. Unfortunately, regulatory complexity and hauler anxiety have limited the success of this outreach to date, leading to missed opportunities for advancing waste reduction efforts.
An active embrace of new ideas and approaches from non-traditional actors in the Zero Waste Plan could significantly impact these types of partnerships in the future, enabling us to quickly build and improve the existing system in sustainable, effective and cohesive ways.

Recommendation 3: Improve understanding of the full lifecycle of materials management (including each stage of the material lifecycle from beginning to end) to reduce loss and discourage disposal within a closed-loop economy

Ridwell believes that Recommendation 3 is extremely important for reasons very similar to those of Recommendation 2. The heart of our business is managing some of the most challenging lifecycle stages of hard-to-recycle materials, and we believe that a deeper, shared understanding of the challenges in materials management, particularly for reusable and recyclable items, will facilitate the development of true closed-loop systems. Such improved understanding will help better identify the opportunities within the current infrastructure, as well as where new approaches are likely to be required, which - as noted above - we believe will be extremely important for achieving the state's zero waste goals.

Recommendation 6: Stimulating Growth of the State's Circular Economy

As discussed above, transitioning from a system originally designed for efficient and safe waste *disposal* to closed-loop *circularity* will be extraordinarily difficult, if not impossible, to achieve by merely upgrading the existing system. Instead, this massive change will require both the development and enhancement of the current industry alongside the encouragement and adoption of new ideas and approaches. By harnessing California's remarkable innovation economy, we can develop, fund, and implement solutions to the many challenges involved in this effort.
Ridwell and other startup innovators in the waste and recycling space have demonstrated both the willingness of the private sector to come to the table with new ideas, and that the public is willing to embrace these new services despite the additional cost and effort at the individual household or business level. Over the past few years, Ridwell has facilitated the diversion of tens of millions of pounds of recyclable and reusable material from over 100,000 households to specialty recyclers and local reuse organizations, despite the financial and regulatory challenges of operating a new type of service in this industry today. Actively embracing innovation and the development of other startups like Ridwell focused on waste reduction has the potential to unleash the kind of investment and change needed for a true circular economy to grow and flourish.
For this reason, we would suggest adding language to Recommendation 6 that specifically calls out the importance of innovators and new ideas focused on addressing the difficult challenges of achieving a zero waste California. The current bullet point examples under Recommendation 6 are all focused on upgrades

or modifications to the existing producer, collection, and end market systems that exist today. While these changes are essential to any successful Zero Waste Plan, we strongly recommend adding another bullet point example, such as:

- "Encouraging the development of new technology, systems and approaches that accelerate progress toward a sustainable zero waste economy."

In conclusion, as a circular economy company working every day to help communities reuse and recycle more, Ridwell is dedicated to supporting California's ambitious Zero Waste goals. By setting high (but achievable) goals, understanding the broader systemic and material-specific challenges and opportunities, and embracing innovation and new ideas, we believe California can create a more sustainable, equitable, and economically robust waste management system.

We look forward to continued collaboration with CalRecycle to advance these objectives.

Thank you for considering our comments.

Sincerely,
Caleb Weaver
Vice President of Public Affairs
Ridwell

Comment 38:

Name: Kaley Laleker
Date received: 8/30/24
Source: Email (**kaley.laleker@saint-gobain.com**)
Attachment(s): Yes
Comment:

Thank you for the opportunity to provide input to CalRecycle as it develops its Zero Waste Plan.

Worldwide leader in light and sustainable construction, Saint-Gobain designs, manufactures and distributes materials and services for the construction and industrial markets. Its integrated solutions for the renovation of public and private buildings, light construction and the decarbonization of construction and industry are developed through a continuous innovation process and provide sustainability and performance. The Group's commitment is guided by its purpose, "MAKING THE WORLD A BETTER HOME".

Saint-Gobain's company-wide, global sustainability goals for 2030 include reducing Scope 1 and 2 CO2 emissions by 33% and Scope 3 emissions by 16%, completing lifecycle analyses on 100% of product ranges and systems, reducing non-recovered production residue by 80%, and increasing the virgin materials avoided by 30% (all relative to 2017 baseline). Achieving a circular economy is critical to these goals and we appreciate CalRecycle's efforts to create a Zero Waste Plan.

Comments on Recommendation 2: Identifies and addresses gaps and overlaps to make current waste management systems more sustainable, effective, and cohesive.

1. CalRecycle should address the gap in programs and policies related to construction and demolition (C&D) material.

C&D material is important in achieving zero waste but tends to receive less of a focus in government programs. The quantity of C&D waste dwarfs that of other waste streams subject to more policy intervention. Based on EPA estimates, the generation of C&D waste in the U.S. is roughly double that of municipal solid waste (MSW), and the quantity of C&D waste disposed is similar to the quantity of MSW disposed.[1] The recycling of building materials presents significant untapped potential for decarbonizing the economy, reducing disposal, and avoiding virgin material extraction. Among certain construction materials, the vast majority are currently disposed, including wood, gypsum wallboard, brick and clay tile, and asphalt shingles, which had corresponding landfill rates of 73%, 86%, 88%, and 86% respectively.[3]

Improved strategies for recycling and reusing construction materials will be imperative to decarbonizing the economy. Buildings and construction are responsible for nearly 40% of global greenhouse gas emissions; this includes the 11% of global emissions that are embodied in building materials. California is a leader in addressing embodied carbon of buildings, enacting the nation's first Buy Clean law and becoming the first state to include mandatory embodied carbon provisions in its statewide building code.

Yet C&D materials have been largely absent from CalRecycle's recent initiatives. As detailed in the Zero Waste Baseline Report, California has recently made several key policy advancements aimed at packaging, organics, and beverage containers. Hundreds of millions of dollars in grant funding has been allocated for organics diversion alone. These policies undoubtably aim to address important issues, such as methane emissions in the case of organics. But in our view, the quantity of building material - significantly greater than that of packaging and organics combined – and the importance of buildings in decarbonizing the

economy warrant a similar level of initiative. The Zero Waste Plan is an excellent opportunity to evaluate this gap and address it going forward. Specific recommendations in this regard are included in the comments below on recommendation 6.

Comments on Recommendation 6: Stimulate growth of the state's circular economy through activities such as:

a. Redesigning products.

b. Implementing infrastructure that reduces waste and enables reuse.

c. Developing markets for recycled materials.

1. California should support the development of infrastructure to efficiently transport, process, and use C&D materials, particularly where there are current gaps.

To achieve circularity for building materials, cost-effective infrastructure must be developed to collect and transport recyclable materials from their point of generation to processors, and ultimately back to manufacturers. Processing capacity must be developed to prepare materials for reintroduction to the manufacturing process. Materials must be separated at the collection site. The logistics network must be made carbon- and cost-efficient for effective transport of collected end-of-life materials to manufacturer sites. For many materials, including certain construction materials, this infrastructure is underdeveloped and geographically limited. Widespread adoption will require multiple scaled operations that are located within reasonable distances of where the scrap materials are generated or where the products are manufactured. This issue is an impediment in developing economically viable circular economies, particularly for heavy or bulky materials where transportation costs can quickly erode material values. Financial support to develop this infrastructure and support manufacturers' investments to incorporate recycled material would be useful. As an initial step, California could partner with a local university and the private sector to conduct analyses of material flows for key C&D materials in California. This effort would provide a sense of the current geographic landscape of generation, processing, and manufacturing of each material to highlight the gaps. The gypsum industry is currently working on such an analysis through a consultant; once completed, the outcome of this study might be used as a model to apply to other materials.

2. California should provide incentives for source-separation at construction sites.

In the early 2000s, CalRecycle provided assistance and model language for local governments to adopt ordinances requiring at least 50% recycling from construction and demolition projects. CalGreen has a longstanding requirement that locally-permitted construction and demolition projects achieve a minimum recycling rate, which was increased to 65% in 2017. These policies were positive initial steps, and some local governments have built upon them to require increasing levels of recycling, up to 100% in some instances.

However, an issue with this approach is that it does not necessarily maximize the production of quality recycled materials that can be put back into the manufacturing process. C&D materials may be commingled on job sites and sent to C&D recyclers to comply with local or CalGreen requirements. C&D recyclers separate usable material for recycling and dispose of residuals. Even very advanced C&D recyclers will be unable to extract all recycled material from commingled loads without unacceptable levels of contamination. Certain C&D materials are especially poorly suited for recycling through commingled loads, including gypsum drywall. In some areas, these materials are effectively recycled through job-site source separation. For example, in the Vancouver area, construction sites often place clean drywall scraps in separate, drywall-only containers, which are transported to a drywall processor and ultimately back to Saint-Gobain's manufacturing facility. In fact, the Saint-Gobain Vancouver drywall plant recently surpassed 1 million tonnes of recycled drywall incorporated into the manufacturing process. Source separation can also help construction sites that are opting for LEED certification, as source-separation is factored into the LEED credit for C&D recycling.

By focusing on a diversion rate for all jobsite C&D, without accounting for the fact that much of the commingled waste that goes to a C&D facility cannot be effectively separated and recycled, California's policy may inadvertently discourage source-separation. California should consider how to update its existing C&D policies to incentivize source separation at construction sites.

3. California's transportation policies should allow recycled asphalt shingles (RAS) in road pavement.

EPA estimates that 13 million tons of asphalt shingles are disposed in U.S. landfills annually, and California has estimated that over 540,000 tons are disposed in California alone.[4] Asphalt shingles are technologically challenging to recycle into new shingles. They are comprised of multiple raw materials including granules, limestone, asphalt, fiberglass bound glass mat, asphalt self-sealant, sand, and back surfacing. Deconstructing a shingle into components with a high degree of purity and high yield is still rudimentary in

its approach. Reincorporation of the low yield material into existing asphalt production lines requires a significant investment in the existing equipment, new equipment, and structures.

However, asphalt shingles can be recycled in pavement, reducing costs and greenhouse gas emissions. Because asphalt pavement itself is recycled, this is currently the most promising pathway for circularity of shingles. It is also an important opportunity because asphalt pavement is among the highest contributors to greenhouse gas emissions from construction materials. Inclusion of 5% recycled asphalt shingles in pavement mix reduces the embodied emissions of the pavement by 9%; this is further increased when used in combination with recycled pavement.[5] The federal government and California are both working to reduce the greenhouse gas emissions embodied in transportation materials.

Using RAS in pavement can have significant benefits, but is not without challenges. The asphalt in shingles is aged and oxidized relative to the virgin asphalt typically used in pavement. In the past, improper use of RAS without addressing this fact has led to instances of premature cracking. Still, there are ways of effectively using RAS in pavement while ensuring a positive impact on pavement performance. In 2023, Saint-Gobain acquired technology from Asphaltica that pre-treats and pelletizes shingles to soften the aged asphalt before it is added to the pavement mixture. The pellets blend well in the mixture and contribute quality, pavement grade asphalt, displacing a portion of the virgin asphalt. Testing has shown that the fiberglass fibers in the pellets contribute to reduced rutting, and a test of mixes with and without the RAS pellets showed that the addition of the pellets actually improved resistance to cracking.

California is one of a minority of states that do not currently allow the inclusion of RAS in pavement under its standard specifications. The vast majority of local governments in California have followed CalTrans on this issue and do not allow RAS. Saint-Gobain has had very positive conversations with both CalTrans and the California Construction and Industrial Materials Association (CalCIMA), and the two organizations have been working together to evaluate RAS for inclusion in specifications in the future. However, this effort has extended over years, and there remains no clear timeline to adopt a RAS specification. Meanwhile, there are virtually no markets for recycled shingles in California. This makes it difficult for local governments to target shingles in their recycling policies, and the material continues to be wasted in landfills.

California's Zero Waste Plan should include a timely development of CalTrans specifications for RAS, as well as stave-level incentives for local governments to allow RAS in their own specifications. Once RAS is broadly authorized for use in pavement, local governments should be encouraged to adopt policies requiring or incentivizing the recycling of roofing material from job sites.

4. CalRecycle should support the use of recycled glass in fiberglass insulation.

The fiberglass insulation industry is a longstanding and important market for recycled glass. Fiberglass insulation manufacturers used 2.2 billion pounds of recycled glass in the U.S. in 2023.[6]

Saint-Gobain's CertainTeed insulation plant in Chowchilla has developed a partnership with a recycler to recycle glass from windshields in its fiberglass insulation.[7] Use of recycled glass reduces energy use and embodied carbon in the production of insulation because it reduces the temperature, and therefore the energy, needed to melt the glass.[8] The Northeast Recycling Council's glass recycling hierarchy includes recycling in insulation as a "next-best" option for non-refillable containers because of the ability to reduce greenhouse gas emissions and energy use.[9] The insulation industry far exceeds California's requirement of 30% recycled content glass in fiberglass.

Getting adequate access to recycled glass is important to reducing the energy use and greenhouse gas emissions associated with insulation production. California generally has strong policies for glass recycling through its Beverage Container Recycling Program (BCRP). The recent expansion of the program to cover certain wine, spirits, and fruit and vegetable juice containers will likely further increase the recycling of glass in California. However, the program gives preference to recycling of glass by container manufacturers. For example, 2022 legislation limited the Quality Incentive Payment Program to glass containers used to produce new glass beverage containers. An additional $60 million allocated through the Glass Market Development Payment Program can only be paid to glass beverage container manufacturers.[10]

The Zero Waste Plan should include initiatives to better support the recycling of glass in fiberglass insulation and put this important end use in parity with glass container manufacturing. Specifically, CalRecycle should support legislation to open the Glass Market Development Payment Program to manufacturers of fiberglass insulation. CalRecycle should also ensure the smooth and timely roll out of the expansion of the BCRP to include additional glass containers.

5. California should review its permitting and other regulatory requirements to ensure they do not pose unnecessary barriers to the development of recycling infrastructure.

As discussed under comment 1, the existence and location of collection sites, transfer stations, and processing facilities for recycled material are critical components of a circular economy. California has gaps in this important infrastructure that will need to be addressed to move toward zero waste. In addition to considering support and incentives for the development of new recycling infrastructure, CalRecycle should conduct a systematic review of its existing permitting and regulatory requirements to assess if and how they pose barriers to circular economies. The recycling industry should be invited to provide input to this assessment, and CalRecycle should develop a set of actions to minimize regulatory burdens for new recycling-related facilities while protecting public health and the environment.

Footnotes

[1] Approximately 181 million tons of MSW were disposed in 2018, compared with 143 million tons of C&D waste. EPA, Advancing Sustainable Materials Management: 2018 Fact Sheet, **https://www.epa.gov/sites/default/files/2021-01/documents/2018_ff_fact_sheet_dec_2020_fnl_508.pdf**

[2] Id.

[3] U.N. Environment, Towards a zero-emission, efficient, and resilient buildings and construction sector, Global Status Report 2017, **https://worldgbc.org/wp-content/uploads/2022/03/UNEP-188_GABC_en-web.pdf**

[4] CalRecycle, 2021 Disposal Facility-Based Characterization of Solid Waste in California, **https://www2.calrecycle.ca.gov/Docs/Web/122544**

[5] U.S. EPA Region 8 (Prepared by Booz Allen Hamilton), Analysis of Recycling of Asphalt Shingles in Pavement Mixes from a Life Cycle Perspective (2013), **https://www.asphaltpavement.org/uploads/documents/EPA_Analysis_of_Recycling_of_Asphalt_Shingles_in_Pavement_Mixes.pdf**

[6] Insulation Institute Blog, Recycled Content Use Tops 3 Billion Pounds (Aug 9, 2024), https://insulationinstitute.org/insulation-manufacturers-used-3-billion-pounds-of-recycled-content-in-2023/?_hsenc=p2ANqtz-_oC3X0-f-qlJuH-DyaSYtcorZ-ds-KavjiYL_3_WvAWR1B7QXC9PVRpjeuplmPR9iv3Ha1FXBSXl92WBO3FYLMZk6qRgsVNvZSCQdILjCl1oI6cLQ&_hsmi=319413214

[7] Saint-Gobain North America, “Saint-Gobain Launches Glass Circular Economy Program at Two Facilities in California, Recycling Windshield Glass to be Used in Insulation Production” (Dec. 13, 2022), **https://www.saint-gobain-northamerica.com/company/newsroom/news-releases/saint-gobain-launches-glass-circular-economy-program-two-facilities**

[8] Glass Packaging Institute, Facts About Glass Recycling, https://www.gpi.org/facts-about-glass-recycling

[9] NERC, Glass Recycling Hierarchy, **https://irp.cdn-website.com/bd31aa5e/files/uploaded/glass_hierarchy_oct_15_2019-c3589e53.pdf**

[10] SB 1013 (Atkins, Chapter 610, Statutes of 2022).

Comment 39:

Name: Zero Waste Sonoma
Date received: 9/3/24
Source: Email (**Xinci.Tan@sonoma-county.org**)
Attachment(s): No
Comment:

To improve current programs and reach zero waste, the Baseline Report recommended that the state implement the following 1-6. Request for Feedback: How does each recommendation help drive us towards zero waste in California? Do you have specific examples of where these efforts have been successful? Or examples of challenges?

1. **Reaches and surpasses existing waste and emission reduction mandates and goals.**
    a. Provide tools to make SB 1383 easier to implement.
        i. Increase interagency communication and collaboration, particularly with Air Boards and Water Boards. It is extremely difficult to permit new composting facilities, and it is unfair that some Air Boards are much stricter than others, depending on the region. We cannot meet SB 1383 targets without building new facilities.
        ii. Encourage carbon sequestration as a climate strategy statewide. Many climate plans and strategies focus, sometimes exclusively, on decreasing carbon emissions, but sequestration is just as important. In addition, that may help jurisdictions’ meet procurement targets.

iii. Support the passage of AB 2346 (Lee), which provides alternative compliance routes for jurisdictions to implement organic waste product procurement.
iv. Provide best management practices for implementing SB 1383 with health facilities. Health facilities prioritize human health over all else, which makes it very difficult to advocate for less waste, especially when so much is disposable to maintain sterility.
v. Dumpster enclosures are consistently too small to fit a third bin. Although downsizing the garbage bin can sometimes help, when the generator in the process of training staff and residents, the transition takes at least a few months where reducing garbage service is not feasible. Especially since illegal dumping is rampant in certain areas, especially for MFDs, the generator's inability to secure bins and keep out contamination only makes it more difficult to successful implement a new organics collection program. Some generators also claim they have been cited by their HOA or jurisdiction for having bins outside an enclosure. Provide draft language or assistance to help jurisdictions change ordinances and policies that prevent bins from being outside enclosures.

2. **Identifies and addresses gaps and overlaps to make current waste management systems more sustainable, effective, and cohesive.**
   a. There is limited market availability of truly recyclable/compostable foodware. For jurisdictions who have local ordinances around single-use foodware and reusables, it is a significant challenge to educate businesses on what foodware they can buy and provide to customers. For example, in Sonoma County, we have decided to allow exemptions for hot cups and sauce ramekins as there are not viable and cost-comparative options. Not only is that confusing to the business, but it's also confusing to consumers when certain items must still go into the trash while all others can be recycled/composted. We are not sure what CalRecycle can do on this topic, but it is more a comment to be aware of.
   b. Not all HHW programs have reuse areas, and if possible, this should be available everywhere. The waste hierarchy for disposal ranks reuse over disposal/incineration.
   c. Statewide reuse campaign. There is so much confusion from the general public between what reuse and repair are conceptually and in practice, versus recycling. Dispel myths about reusable food ware (e.g., cups, plates) being unclean/unsanitary.
   d. It is difficult to enforce reusable foodware ordinances as many food facilities do not storage or dishwashing capabilities. Providing grant funding for such infrastructure would go a long way.
3. **Improves understanding of the full lifecycle of materials management (including each stage of the material lifecycle from beginning to end) to reduce loss and discourage disposal within a closed loop economy.**
   a. Develop a statewide strategy to address woody feedstock created from fire mitigation (e.g., PGE cutting down trees by powerlines) or forest management. This organic material is not addressed in SB 1383, and it is not clear who is responsible for managing that material. The lumber could be valuable if used for construction or furniture, but it is often chipped and ground. Landscapers and public works departments have very few options for reusing or disposing of the material. Furthermore, they do not count towards a jurisdiction's procurement target.
   b. Develop statewide policies and/or grant programs to encourage deconstruction, reuse of lumber (particularly old growth), and reuse of architectural salvage.
   c. More widely encourage EPR as a sustainable way to ensure that the producers are invested in the management of the products they make.
4. **Combats environmental health and justice issues associated with the lifecycle of material production, consumption, and waste generation.**
   a. For SB 1383, foodware ordinances, CRV, or other policies, enforcement penalties are unequal in impact for chain stores vs. small local businesses. Chain stores are often more willing to pay a fine for noncompliance rather than try to be in compliance, whereas for small local businesses, the fine is much more significant to their profit margins. Fines should scale with a business's size or annual earnings.
5. **Maximizes environmental, social, and economic benefits of a circular economy.**
   a. More statewide policies are needed to encourage waste reduction and reuse, particularly by keeping materials and resources local. For example, there should be more building reuse, deconstruction training/skill building/job opportunities to build the reuse economy.
6. **Stimulates growth of our state's circular economy through activities such as:**

a. There should be tax breaks for using recycled/reused content in materials production over virgin. For example, textiles and SB 707. There should be liaisons in each jurisdiction.
b. There should be more state policies to implement infrastructure that reduces waste and enables reuse. Perhaps CalRecycle could initiate a statewide study on the existing reuse economy to determine baseline number of jobs, tax contribution, standard NAICS codes to use for regional/local studies.
    i. Secondhand markets for all products
    ii. Used vehicles
c. CalRecycle should develop and expand markets for recycled materials.
    i. We strongly support the recommendations from statewide commissions on market development.

For questions on this feedback, please contact Sloane Pagal **Sloane.Pagal@sonoma-county.org** or Xinci Tan **Xinci.Tan@sonoma-county.org.**

Comment 40:

Name: Cherise Petker
Date received: 9/3/24
Source: Email (**cpetker@gmail.com**)
Attachment(s): Yes
Comment:
Dear CalRecycle Zero Waste Plan Team,
My project/startup Circular Solar LLC, solves how to increase diversion rates of three wastes which go to landfills: glass, concrete and wind turbine blades. I turn them into clean energy charging infrastructure which can generate anywhere from 3% - potentially 15% additional solar energy yields (ground mounted) with options for battery efficiency increases also. This is decades in the making but field tested on a proof of concept and testbench for 2.5 years now. Additionally, I use carbon reduction (CDR) tech with these wastes as a host to passively capture, reduce tailpipe pollution which builds up in this highly polluted, Justice40 area. A similar coating I used in a low carbon, MSW waste, cement and glass sculpture in Fairfield, CA in; I brought an early version of this coating to the US from Canada in 2002. The version I use today is made in a G7 nation but its US location distributes in California; Circular Solar can be Made in California.
Glass and concrete are wastes in the Zero Waste plan, however, wind turbine blades, per my research, is a totally untouched market in California and per my due diligence blades are shipped and landfilled out of state. This can change with Circular Solar projects. I made this to meet the 2025 EU blade landfill ban and I am requesting CalRecycle to please consider this for US implementation – there are solutions for recycled product such as an SCM replacement in cement, reducing clinker (high emissions/CO2/GHG), Veolia supplies a crushed version for cement companies to burn in kilns for WtE as an alt fuel to coal, nat gas. Obviously, reusing wind blades be ideal, especially for use in clean solar-bess projects.
After the Recommendations, I share a pitchdeck/whitepaper for your department to assess viability.
Thank you,
Cherise Petker
Founder, Circular Solar LLC
CircularSolar.net
510-926-7245
Recommendation 3. To my knowledge, WT blades are decommissioned, then shredded or moved whole to out of state landfills, usually Texas or Wyoming. Repurposing blades back into daily clean energy is an option.
Recommendation 4. Glass bottle, jar can contaminate to increase landfilled materials (compost for ex.), if consumers see a glass use in. improving clean energy efficiency thus improving air quality, this may improve CRV rates. WTBlades going to landfill in other states for incineration has some air quality experts concerned. Repurposing or recycled into material use, offers environmental justice and landfill diversion.
Recommendation 5. Rerposing glass, concrete and WT blades into energy generating infrastructure supports clean energy, thus cleaner air and water and as a host for CDR technology can passively reduce ICE vehicle and some heavy industrial emissions build-up, also for cleaner air and water, until we get to Zero. Thus, ZeroWaste reused as carbon/pollution capture and reduction infrastructure that generates higher solar-battery and some EV charging efficiency.

Recommendation 6. Adding a ban on landfilling wind turbine blades within the state or being shipped out of state would open up an entire new circular economy market and is repurposed, reused in some the highest demand markets: solar, solar-bess charging, ev charging, as a host for tech to reduce Justice40 emissions.
Thank you,
Cherise Petker
Founder, Circular Solar LLC
Info@CircularSolar.net

Listening Session (EJ) – August 26, 2024

Comment 1:

Name: Aditi Varshneya
Date received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Hey! As we heard during the interactive sessions earlier, incineration is a big concern! The legislature actually specifically called out that the plan should analyze state and local opportunities and efforts to more quickly transition away from incinerators to improve air quality, however, the initial plan doesn't talk about incinerators. Are there plans to address this?
End waste colonialism! 49% of plastic waste exported to Mexico left from San Diego!
https://mexicotoxico.org.mx/waste-colonialism/

Comment 2:

Name: Amanda Rivers
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Supporting small farms (CSA boxes decrease food waste), wages for farmers are not livable.

Comment 3:

Name: Cynthia Babich
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Does not seem that there have been legitimate goals for quite sometime. I would like to work on smaller facilities for recycling and composting. Clean projects that are community led. Replace toxic sites with these types of facilities. Waste management does not collect recyclables in my area of Kern County. Community grants and resources to drive cleanups and collections in our own communities.
Do you have enough authority to reach your goals? Not enough smaller recycling systems. In Rosamond you have to travel to Lancaster to recycle. Big holes in the systems. More publicly assessable trash bins and recycling with proper labeling and instruction needed. Trash is all over the streets, in our stormwater channels, the homeless need to have receptacles handy. Less dumping if there are more trash bins. Everyone worries about the cost to maintain the bins, what is the cost of trash all over the streets and waterways?
Support community feedback opportunities. Hear from consumers the ways that they save and reuse, egg cartons as example. Keep California's waste in California. Keep recycling locally.
I'm thinking about what we're doing in my community. There's someone who takes trash out of cans, carries selected pieces down to Dominguez channel, throws it into the drain. Folks started to take action, took the planters that this trash was going into, replanted with drought-resistant and natural flowers, got the county to screen the area…it required a lot of work. The community is taking on the enforcement responsibility. CalRecycle needs to be figuring out ways that you can do some one-on-ones with communities to gain this information, collect it up, share it. Will bring more power to enforcement on our end. Environmental health, psychological impact – the community constantly trashed out, no one cares, it's really hard to be engaged in anything.

One of the problems in our community is a lot of air pollution. We've been learning about the benefits of vegetation walls. We need free soil for the community, free trees, to supply the vegetation walls. Have recycling on the front end at a more local level and local composting facility. How do you do workforce development at a community level? If no spaces for this to happen, I don't know how we'll get it to work down at the community level. Many master gardeners, still finding problems with how to compost table scraps without attracting vermin etc. If you keep the trash local then people will see the impact. Education could counter out of site out of mind.
Go back to things that worked before. Health food stores = bring your own containers: jars for fresh ground peanut butter, grains, produce bags, cloth bags. Northern California was a leader here and then throw away became the call. How do we pull back on single-use concepts? More education on the energy needed to make a glass bottle, paper bag. Make recycling mandatory, not a choice.
Incinerators are Dioxin Production Units. I need the drivers to change out facilities, like brownfields redevelopment. Put in the investments in our communities. I have a great pilot project.
Thanks to your solid team and thoughtful staff. We will contact you for an in person meeting at DAAC. You could be the umbrella and we could sub grant without all the federal paperwork and red tape. Folks have the capacity to do the work not necessary the paperwork load. Need to brainstorm with you on grants not just that a grant is available. Let's be strategic and targeted in these efforts.

Comment 4:

Name: Dan Noble
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Is the tangible goal actually ZERO waste… if not, what is the goal?
Let's say the goal is 90% "recycling"/"diversion. Some companies have reached this. However, I'm not aware of a jurisdiction reaching this.
In the container system, there's no immediate feedback if you put the wrong material in the wrong bin. For those jurisdictions that do provide feedback by ticketing the generator or not picking it up – in the self-haul industry, some composters simply reject loads due to contamination, it has to be carted to the landfill – having more feedback systems directly to the generator is one way to improve the system.
It's mathematically impossible to maximize more than one variable at a time… The triple bottom line (people, planet, profit) is best considered as asset classes. People part broken into humans and social, planet … RMI … it's not possible to maximize all of the variables if you consider them all value categories- the best we can do is optimize them. I have been teaching circular economies from 40 years ago at the high school and college level. Regarding the compost arena, you can optimize value categories at the local level, but that's a political process. Can go through community governance, that's really where it's happening. Management teams have been evolving from top-down command and control to a networked team of teams approach. Statewide compost association, setup compost coalitions that include composters, community, generators, all types of organics managers (professional, citizen, facilities like schools). In the Zero Waste Plan we must use terms that are actually achievable.
On the metaphor of circular economy, I captured the term from ecology texts in environmental studies, this idea to make it circular just like nature does. But in ecology this means multiple concentric circles at all kinds of scales and all kinds of distribution points, for example from the desert to the redwood forests in the North Bay. The way is to miniaturize the distribution of resources such that you can recycle at least organic resources locally… energy is a big deal. The idea of minimizing transportation is key, but the communities are all connected. We get a lot of our products from China, we were sending much of our waste to China until recently. How does that relate to the transportation industry?
Need intelligent appliances that can do the recycling right on the spot, whether physical recycling or biological recycling, which the organic industry is about – they all require different technologies. This will require distributing and making the information intensive, using AI and the internet of things, to rebuild the circular economy. We must optimize materials, circularity, costs and benefits. This effort is hugely information intensive, but I believe we can do this.

Comment 5:

Name: Dennis Uyat
Date Received: 8/26/24

Source: Listening Session
Attachment(s): N/A
Comment:
I grew up near an oil refinery in Southgate, worked on SB 674 for air monitors around the refinery to track chemicals, production of asphalt shingles, asphalt for roads, petroleum-derived products. OEHHA has a chemicals list of those that are harmful to people, and air pollutants. Environmental Working Group also has research around how chemicals impact people at research process, production, and disposal. We need to identify which chemicals are hazardous, what products they're in, what packaging so that people can make informed decisions about the chemicals they're interacting with, microplastics and bioaccumulation of chemicals, tracking of chemicals and human exposures, help determining how peoples' health are impacted.
Portland, Oregon has a glass bottle collection system that collects glass bottles in a recycling bin at the curb, and instead of crushing them they are sent to industrial washing facilities. Have take-back programs for materials to be washed in a regional facility and put back into the economy are a higher and better use. 1950s style glass milk bottles are another example.

Comment 6:

Name: Farhana Weerasinghe
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
More Community Education, Incentives. Improve Waste Management Infrastructure. Develop Green Jobs, Corporate Partnerships, Schools and Youth Programs. Incentivize Circular Economy Practices. Ban Single-Use Plastics. Encourage Grassroot Community Composting, Urban Farming. We have one very successful community composting going on here in Fresno CA. We invite you to come and visit us. El Dorado Park CDC, 1319 E San Ramon Ave. **Farhanaw@edpcdc.org**

Comment 7:

Name: Hailey Meyer
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
There are issues with each city having a different waste management company, and how certain companies allow the collection of hazardous waste materials, but many don't and makes it harder for the elderly to proper dispose of unwanted medications, as few can drive out of town to a proper disposal facility. Even when people take those medications/ lightbulbs/ batteries to a proper disposal facility, they need to pay to drop off those items. There needs to be a better solution so they don't keep ending up in the garbage where they create fires in garbage trucks or affect our water.
Citizens who live near landfills understand the importance of why they need to properly sort waste, while others who have not been near a landfill, don't see the importance of why they need to properly sort waste as their day to day lives are not directly impacted at the moment. More education is needed in those communities that don't see how their daily decisions affect others' lives and health. Finding a way to make this part of the curriculum for K-12 schools can make a big difference for future generations.
Reusable food ware for takeout could make a big difference. Colleges have given opportunities for students to have to-go containers. Once they are used, the students take them back to the dining commons where employees will wash it and put it back into the reusable food ware system. If there is a way to create this program for sit down restaurants/ fast food restaurants, this could reduce waste significantly.

Comment 8:

Name: Irene Takako Farr
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
I work for the Better World Group, I'm here in a listening capacity. Previously I worked for a private hauler in the LA area. I have heard through my professional experience in education and working with businesses

how inaccessible composting can be. Many communities don’t know how to receive a compost bin, let alone educate staff on how to use them.
LA County had a single-use plastics ordinance. During implementation, with costs for businesses, especially single-use disposables and takeout, folks were concerned about the cost for compostable materials, especially for hot foods. There were questions about what the viable alternatives were. It’s often the haulers that are doing education on waste, not the city or state jurisdictions. The costs on waste are carried by the haulers, not by the jurisdiction enforcing the policy. This leads to resistance from community members because trash is more expensive. There’s a lack of trust and a need to build that relationship

Comment 9:

Name: Janaki Anagha
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
We are working on developing a fund for these kinds of projects over at People Food and Land Foundation and hope that if you are in the Central Valley working on these issues you will consider getting in touch. https://peoplefoodandland.org/

Comment 10:

Name: Konstantin Miatchine
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Public still needs to be educated more on the process of separation of garbage to be separated between the appropriate trash bins. They need to know that recycling can be done easily. Also, we need to teach kids more about recycling and garbage separation. Additionally, people need not to drop garbage on the streets.

Comment 11:

Name: Laura Haider
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
I like to keep refilling my own bottles with water from a filtered water machine, but they are not present or working in all communities. Help homeowners afford new refrigerators. Fluctuating temperatures in the refrigerator could quickly spoil vegetables.
Don't allow manufacturers to sell products in containers that are not recyclable in CA.
Every other day parts of the Kettleman Hills Landfill are uncovered and the storms of climate change could blow dust onto neighbors’ yards (dust with chemicals used to treat toxic chemicals in our waste and degradation products of plastics with toxic metals).

Comment 12:

Name: Linda Phillips
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
The Santa Barbara area has some interesting and useful programs to encourage, educate, and provide recycling, reuse, etc.

Comment 13:

Name: Linnea Whitney Skierski
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:

Important to achieve the goals that were set as well as allow different state programs to complement each other.
Accessible solutions and waste/recycling services needed for houseless people.
Working more on connecting the upstream parts of the system with the downstream, and increasing our understanding of how the system connects, this can help us not only design for recyclability but make it easier to reduce, reuse and recycle down the line. Yes, we need the infrastructure to recycle, but producers need their hands held on improving their own processes.

Comment 14:

Name: Lovina Redner
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Need servicing rural areas better. Some communities are further away and cannot have services come to our areas.

Comment 15:

Name: Olivia Sanchez
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
The differing franchise agreements aren't conducive for recycling let alone zero waste. We still have low landfill rates in So Cal. There is more local manufacturing in CA, so the chances to recycle or reuse has more stringent requirements and there is increased recycling and reuse so items are not just single use. Refuel Your Fun is a good example

Comment 16:

Name: Ruth Abbe
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
Local governments have no authority to enforce recycling and composting at public schools. Plus schools can also select a hauler that is different from the local service provider. We need CalRecycle to assist/enforce reuse, recycling and composting at public schools and other state agencies. I wanted to emphasize that many/most families go through the public school system. Therefore, having synergistic programming, outreach, and messaging at work, at home, at school reinforces the change in behavior that we seek. Currently, these systems are sometimes out of sync (separate collection systems, what can be recycled, etc.). Castro Valley is a good example of a community that is attempting a holistic approach.
Contact for Castro Valley:
Naomi R. Lue
Zero Waste Supervisor Castro Valley Sanitary District
21040 Marshall Street, Castro Valley, CA 94546-6020
510-537-0757 (main), 510-537-1500 (direct)
naomi@cvsan.org | www.cvsan.org
Can you connect EJ communities to Federal funding? Technical assistance is needed for grant writing, and to help identify grants to support Zero Waste.

Comment 17:

Name: Staci Heaton
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
We must also look at ways to tackle green waste, waste from defensible space activities, forest restoration, etc. There aren't enough end uses in California for these types of waste streams, and we must get beyond piling/burning and landfilling.

Comment 18:

Name: Tania Schwartz
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
I wish all fast food restaurants where we are responsible for throwing our own trash has the organics bin to teach people who to sort organics with a wider audience.

Comment 19:

Name: Terri Hannon
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
For people who want to help ("do something") to facilitate this vision, what can we do and where can we help? Even in areas that do pickup recycling materials, what and how it is picked up changes all the time and most people don't even believe it's not all headed to the landfill. It's demoralizing and NOT encouraging people to even try. Community outreach and clear information is needed. A community enrollment program. If there are jobs in this field, where might they be posted or listed? My local resource center is very closed with information. It's confusing to me. Sonoma County seems to be interested in community education. If their system is working, can other locals follow their example? Is there a department within CalRecycle dedicated to community outreach? If so, where?

Comment 20:

Name: Tina Calderon
Date Received: 8/26/24
Source: Listening Session
Attachment(s): N/A
Comment:
There are no local recycling options for polystyrene containers yet the majority of restaurants use those for take-out.

Listening Session (Tribal Affairs) – September 16, 2024

Comment 1:

Name: Cassidy Moyer
Date Received: 9/16/24
Source: Listening Session
Attachment(s): N/A
Comment:
This is not Tribal, but we started a PaintCare program to help recycle/use up paint to help reduce hazardous waste in landfills. Located near Mammoth and Bishop.
Seems like a lot of reuse/reusable programs need financial assistance especially. Both grants and incentives, just more opportunities in general.

Comment 2:

Name: Graton Rancheria
Date Received: 9/16/24
Source: Listening Session
Attachment(s): N/A
Comment:
Challenges: Less local recycling locations (plastic / aluminum / glass bottles.)
Challenge: Higher annual garbage service costs (most include pickup of recyclables). For folks who don't recycle, payment of the CRV fees at store purchase equals an added tax.
Challenges: Local recyclers want recycled waste to be cleaned prior to pickup. This is an extra burden which will may cause people to recycle less, and just throw those materials in the landfill receptacle.
Suggest more compostable materials, less plastic / single use; more bulk beverages instead of single use size at point of purchase.

Challenge: Our county only has one drop off location for paint / batteries; this is a challenge with citizens with limited transportation options (weekly garbage routes won't pick up hazardous waste).
Our Tribal Environmental program has sponsored 2 electronic waste (e-waste) events, and they were very successful! We even added a shred event for confidential papers, VERY appreciated! Our local service provider assisted with the e-waste events (separate, haul off), easy drop off was at the Tribal office. Our Tribal IT team helped with the e-waste events to pull out the hard drives or memory devices with computers/ printers recycled. It was on a scheduled date, with a flyer / newsletter ad. Partnership effort, scheduled in spring / summer time (better weather). During our shred event, we had our shred contractor on site so citizens could see their materials getting shredded, better assurance.
Funding compost programs on Tribes; compost from recycled food items should be free (this would support a more circular inclusion of Tribes) towards this recommendation.
More support for facilities that offer reuse materials for purchase. Habitat for Humanity Rehabit stores have a great concept that makes reused items for sale at reasonable prices.
Need less competitive funding opportunities for Tribes; i.e. formula/priority funding for Tribes, in areas of scarce recycling locations.

Comment 3:

Name: Henry Baker
Date Received: 9/16/24
Source: Listening Session
Attachment(s): N/A
Comment:
It would be nice to see more community-scale composting opportunities and technical assistance for establishing community composting to help us navigate the regulations. A big barrier for us has been the CalRecycle standard Terms and Conditions due to sovereignty concerns. We were awarded a CCG3 but cannot accept due to the audit requirements. CalRecycle could assist by providing opportunities for filling the gaps in circular economies, such as connecting post-consumer recycled products with potential buyers.

Comment 4:

Name: Ruchika Jaiswal
Date Received: 9/16/24
Source: Listening Session
Attachment(s): N/A
Comment:
I agree with Henry - especially in densely populated areas where a lot of waste is generated but not sorted. I can't speak for rural areas though.

Comment 5:

Name: Trevor Partida
Date Received: 9/16/24
Source: Listening Session
Attachment(s): N/A
Comment:
Any recommendations for me to hold an e-waste event for my Tribe?

Workshop – January 24, 2025

Comment 1:

Name: Bianca Lopez
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Recommendations need clarity. Definitions should align with EJ principles and prevent industry from co-opting terms.

Comment 2:

Name: Evan Edgar
Date Received: 1/24/25

Source: Workshop
Attachment(s): N/A
Comment:
Circular economy disrupted with Zero Emission Vehicles (ZEV). More outreach on the Plan is needed. Address PFAs in compost. Importance of carbon-nitrogen ratio. Include bioenergy in zero waste. Need clear definitions and numerical targets.
Cap and Trade to expire, concerned about future funding. Raise tip fee and create market signals and incentives that align with zero waste goals.
Mid and small facilities ae not supported and are challenged by ERCs. Programmatic EIRs could help. Improve existing infrastructure and have better messaging to avoid contamination. SB 54 helps avoid "wishful recycling".
ZEV model disrupts circular economy by favoring batteries over bioenergy. Need carbon credits to support carbon farming. Use carbon-negative fuels to achieve neutrality, avoid landfills, reduce pesticides/diesel use. Batteries are carbon-positive.
Permit streamlining is challenging and interagency collaboration is important.
The benefits of carbon sequestration in soils are different from carbon capture in geological structures. Importance of community composting hubs in city programs and model ordinances to nurture zero waste communities. Highlight Natural Working Lands/sustainable and regenerative agriculture. Carbon negative programs are important (e.g. renewable natural gas, bioenergy, anaerobic digestion, biochar). Support compost hubs and carbon farming. Some bioenergy/biochar programs are dependent on and stalled by government approvals/renewals. Market development for wood waste is needed.
There is current research in biochar to reduce odor and on natural fibers for textile extended producer responsibility or EPR (challenges of textile compostability). Support research bioenergy and biochar. Identify materials with biggest GHG reductions and secure funding (e.g., cap and trade). Consider lifecycle assessments and costs, business modeling to include job creation and GHG reductions.
EPR is doing good work to help prevent greenwashing (while SB 1383 is challenged by lack of feedstock). CA-made branding would help circular economy.
CalRecycle needs to use data from locals and stakeholders for feedback and insights. Data reporting should also be timely. Be transparent, responsive, look at different sectors, include GHG.
Need global community engagement, public-private partnerships, community benefits agreements. Involve Tribes and EJ community to ensure success.

Comment 3:

Name: Grant Readle
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
SB 54 provided market signal to prohibit products. Enforcement is important and should be supported. International collaboration could reduce SB 54 work on determining what is recyclable/chain of custody by working with countries that take 90% of exported recyclables and getting an official statement.
Use of technology (e.g. smart AI cameras on collection vehicles) will provide valuable data that can be abused if in the wrong hands, need to protect this data with privacy policies and safeguards (e.g. in Request For Proposals)

Comment 4:

Name: Gregory Reaume
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
More specific implementation information in the Plan is needed, especially related to waste producers.

Comment 5:

Name: John Davis
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A

Comment:
Definitions should be clear, zero waste and materials management are not the same and need work to define them. Look to Oregon for work on lifecycle analyses and to EPA for upstream management.
The tip fee has not increased since 1993 while energy and labor costs in CA are higher than other states.
RMDZ is successful in supporting businesses but does not address all issues or declining value of materials. Create market signals and financial system. Market development can benefit from GO-Biz.
Circular economy and materials management need to be defined. Important to understand impacts and responsible end markets. Local communities need resources for community initiatives.

Comment 6:

Name: John Kennedy
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Collaborate with DTSC on hazardous waste. There's a disconnect when what we manage is derived from resources produced elsewhere. Most waste is not generated by the everyday consumer. It is important to preserve and reuse resources.

Comment 7:

Name: Julia Levin
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Address biomass in landfills, especially as woody waste will increase due to wildfires. Incorporate bioenergy into waste management. Focus on highest and best use. Include incentives for beneficially used landfill gas.

Comment 8:

Name: Laura Plascencia
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Community engagement and education is important. Discuss repair and reuse, resource sharing. Engage for localized solutions.

Comment 9:

Name: Michael Caprio
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Raising AB 1220 tip fee is challenging due to franchise agreements, not appropriate due to original intent, and unfair to operators. Other options include fees at point of collection.
Need a compliant public education template for SB 54 and coordinated educational efforts in general.
Upstream changes will help achieve goals.

Comment 10:

Name: Nick Lapis
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Have more specific, implementation-based recommendations.
Define "recover" to prevent discharges into the environment.
Compare existing funding programs to identify best practices. For example, the Plastic Market Development Program (payment for tons recycled) is a better model than grants. Need sustainable funding model/plan for food recovery.

Previous bills on interagency collaboration (AB 1045, AB 2741, AB 1981) should be examined to see how they are working and what could be improved for interagency work.
Identify changes that are within existing authority and those that need statutory change. There are mandatory sections in the Plan. We want a detailed, actionable plan.
SB 1383 communications needs to be compiled at the state level. Consumer education should focus on household practices, does not need to wait for economy to be more circular.
EPR programs need better coordination in marketing and outreach plans, messaging should be harmonized so it's easy to find information in one place.
CalRecycle should make its data more publicly available. Need more monitoring and data collection for SB 1383 participation and tracking. Could use tools like AI at MRFs and truck cameras.

Comment 11:

Name: Nicole Tai
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Toxic materials and harmful C&D materials are a problem especially after wildfires. Interagency collaboration is needed for better integration of green building code and circular waste management.
Need clear definitions for zero waste, circular materials management, waste prevention. Avoid harmful/nonrecyclable materials and include repair, refill, remanufacture in reuse.
Work with CARB to update reuse calculator for carbon emissions. Add reuse into cap and trade for local carbon credits. Fully fund reuse and create model local ordinances for reuse infrastructure and grants.
These recommendations should all include reuse. Reuse infrastructure needs to be improved and expanded. Higher reuse targets of 50-75% would help circular economy.
Actionable steps and enforcement are needed. Waste free communities could be nurtured by climate councils/sustainability commissions. Current local ordinances for reuse could be improved.
The messenger should be NGOs at K-12 schools and not CalRecycle, focus on youth and success stories.
Data gaps need to be filled and be more accessible to locals. More collaboration needed to determine what data is necessary and to standardize data collection and reporting. Reuse sector should be prioritized due to lack of existing data.

Comment 12:

Name: Sheng Su
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Support use of local agricultural materials to create renewable products. My goal is to design systems that support zero waste, reduce costs, and enhance urban agriculture. Research is needed to scale up processing/manufacturing capabilities for small operations. Recycling and sorting process for the consumer needs to be more efficient, easy, and convenient. We need more data on equipment usage, to help design additional equipment that fill in gaps. Reduce costs while maximizing benefits for all, focusing on local initiative, women, families, people with disabilities. Consider land limitations in developed areas.

Comment 13:

Name: Stephanie Lau
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Include EPR and reuse.

Comment 14:

Name: Steve Haze
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:

Is whole orchard recycling and bio-circular utilization included?
To what extent will GO-Biz Catalyst Fund, CalPERS Investment Portfolio, and CA Insurance Commission's COIN Program be incorporated -- not just Cap and Trade?

Comment 15:

Name: Tedd Ward
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Policy recommendations should focus on production incentives (current incentives create imbalance between production and recovery by supporting petrochemicals).
Separate organic and technical materials. Zero waste definition should exclude litter/dumping and incineration/fuels.
Recommendations need more specifics. Include and address reuse, refill, repair as they have different infrastructure and facilities. Include salvage and resale.
Pilot projects and incubators help create zero waste communities. Substantial resources are needed for local and community-specific efforts. Products with short lifespans quickly become waste before they can be reused and should be addressed by state-wide policies.
Include formal training of solid waste/recycling industry professionals, and for chemical engineers on environmental toxicology.
Need to phase out materials that have no recovery options at end of life due to their nature or construction.
Address hazardous elements of material and need for enforcement.
Outreach should happen only after economy is more circular (e.g. zero waste design principles, economic adjustments).
Industry engagement is needed, reach out to manufacturers to see how they can become reusable or recyclable.
Consider unique challenges from rural communities. Utilize local food distribution programs to set up pilots on how to return packaging for food distribution. Focus on lowest economic levels of the community and use institutions for outreach and collection programs. Address statewide economic issues and don't rely solely on communities to come up with zero waste programs.

Comment 16:

Name: Thomas Helme
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Transition to circularity should create green jobs and reduce pollution burdens without repeating past mistakes in environmental justice communities. Waste is not a commodity (e.g. to support incinerators).

Comment 17:

Name: Veronica Pardo
Date Received: 1/24/25
Source: Workshop
Attachment(s): N/A
Comment:
Does waste prevention include source reduction? Interagency collaboration is important. The state needs to lead by example.

Comment 18:

Name: Phoebe Schenker (**phoebe@reusealliance.org**)
Date Received: 2/5/25
Source: Email
Attachment(s): Yes
Comment:
Dear CalRecycle,

Thank you so much for the opportunity to submit feedback on the Zero Waste Plan. It is imperative that we transition to a circular economy as quickly as possible and we very much appreciate CalRecycle mapping out a plan to get us there.
That said, we are exceedingly underwhelmed by the proposed plan. For a document and process that is costing taxpayers millions that could be spent on reuse infrastructure, we were hoping for a lot more detail and specific strategies.
We have also not been contacted by Accenture nor do we know of anyone in the reuse space who has been. The only requests for input have come from CalRecycle in the form of this meeting and request. Accenture would certainly benefit from spending more time on the ground in California engaging with the experts who are doing the hard work of transitioning our economy to a circular one.
Our specific feedback on the proposed strategies follows.

1. Policy and Regulation

A. Review and refine existing policies, programs, regulations and statutes to align incentives and requirements with materials' highest and best use.

What specific policies are going to be addressed and how will they be refined? There is a different process for changing a policy vs amending a law. Who is going to do this work and how will it be funded?

B. Adopt a California circular materials management framework to develop and implement policies that prioritize waste prevention and proactive circular materials management

What is a California circular materials management framework and how is it different from a Zero Waste Plan? It would be much more helpful to identify specific materials and the specific levers that California has to prioritize waste management. Are they suggesting Extended Producer Responsibility Laws, or Procurement Strategies, or taxes, or other incentives or penalties?

2. Financial Mechanisms

A. Establish sustainable public sector funding that supports California's circular transition

Where is this funding going to come from (taxes, tip fees, EPR revenues, Cap N Trade, etc.) How much funding is required, and how will it be distributed? How will you ensure it's sustainable when the budget process is so variable year to year?

B. Align market signals with zero waste and circular behavior

This is a confusing statement. It is not the government's responsibility to respond to market signals, that is what the market does. It's up to the government to regulate market forces to ensure that the public good is protected. CALRecycle should be pushing the market towards what is right for the planet, health, and the people of California.

C. Reduce challenges for new and expanded infrastructure development

What challenges are being referred to here? Permitting challenges, financing challenges, logistical challenges? It would be more beneficial to identify the desired infrastructure, what the challenges are, and how California will reduce them.

3. Infrastructure for Circularity

A. Modernize and improve utilization of existing infrastructure

Again, what infrastructure? Circularity is a consumption issue not a waste issue. The infrastructure that needs to be revised is that of the distribution and sale of goods, not the waste and recycling infrastructure (although this too needs to be modernized and improved to allow for the pick up and sorting of reusable goods and their redistribution). Further investment in recycling and landfill infrastructure is a waste of money.

B. Spur the development and expansion of proven, equitable circular business models for finished products

How are we going to identify these models and what will be the mechanisms for spurring and expanding them?

C. Expand and develop equitable, distributed ecosystems for materials reuse

What does this look like? There are four types of reuse (resale, repair, repurpose, and refill) each requiring different infrastructure and all needing to interact to make a successful ecosystem of reuse.

4. Partnerships

A. Nurture waste-free community and economic clusters grounded in circular economy principles

This is an interesting idea, if it is referring to Reuse Hubs similar to what we are creating in Sonoma County. How will these be nurtured? They require property and funding. Perhaps this could lay out some specific strategies for making state land and start up funding available for these efforts?

B. Establish a culture of inter-agency collaboration that elevates circular economy at the local, state, and federal levels

This is a noble goal, but how will it happen. What are the current barriers? This section should identify specific procurement strategies, policies, and mechanisms for changing this culture.
C. Lead local, national, and international multi-party collaboration to support zero waste implementation
Again this recommendation lacks specificity.

5. Research and Innovation

A. Support the adoption and scaling of circular innovation and learnings
This is the same as item 3G above.
B. Facilitate research initiatives to advance understanding of materials management and develop solutions
If this is a proposed program similar to the DOE American Made Challenges prize program then it is a good idea - providing access to experts for entrepreneurs and nonprofits tackling these challenges is effective, but only if it comes with funding. What could we learn from that program and what would make this different at the California level?
C. Accelerate innovation in circular product and business model design
Again, unclear how this is different from 3G and 5L.

6. Communication and Awareness

A. Tailor communication and education campaigns to audience-specific behaviors, barriers, and consumption patterns
This seems to be stating the obvious, that communication should relate to solving problems. What campaigns will be run? How will they be designed, funded and distributed?
B. Improve visibility and usability of circular resources and tools
This is a useful recommendation, and we would love to see the CALRecycle website become an effective source for reuse resources across the state, or for CALRecycle to develop a mapping tool that individual county waste agencies could use to provide reuse **resources locally.**

7. Data and Monitoring

A. Expand and standardize material flow data visibility across material types and management pathways
Unclear what this means or why it is different from 7B.
B. Improve and expand data analysis to inform new solutions and improvements on current systems
It would be great to see specific proposals about what data, how it will be collected and how it will be made accessible.
C. Stimulate bi-lateral participation in the circular economy through open and crowdsourced data
We agree that better, more transparent data provided more frequently would help in the transition to a circular economy.

8. Community Engagement

A. Deepen understanding of Californians' behavior patterns, consumption trends, needs, and interests to enable a human-centered circular transition
How will this be done? So far there has been no direct community engagement on the part of Accenture that we are aware of. They are being paid a lot of money to perform this service for CALRecycle as part of the Zero Waste Plan. What is their strategy?
What is the timeline? How will they get the word out and ensure the broadest possible input?
B. Proactively engage and empower environmental justice advocates and underrepresented communities to participate in California's zero waste and circular transition
See response to 8A above.
C. Foster open dialogue with community members to promote continuous and inclusive input from all voices
See response to 8A above. These all say the same thing with no specifics. The timeline on the website doesn't include any information on future opportunities to engage so it is hard to know what is planned and how to organize an effective response.
How do these recommendations help drive us towards zero waste in California? Do you have specific examples of successes or challenges in your community?
While many of these recommendations could become a useful road map, they lack specificity, and are repetitive, and therefore it isn't clear how these recommendations will actually work. We are running many successful programs in our community that could be helpful specific examples if we were contacted. These include our Repair Fairs and Reuse Bazaars, Research and Advocacy Initiatives, Climate Action Plan templates, Deconstruction Ordinances, and much more. We would suggest that CALRecycle demand that Accenture spend some of the money engaging with the organizations that are doing the work here on the ground in California and could help provide the details needed to turn this vague outline into a concrete plan.

Thank you for providing this opportunity to comment. Please don't hesitate to reach out if we can provide further information or insights.
Sincerely,
Phoebe Schenker
Executive Director
Reuse Alliance

Comment 19:
Name: Tedd Ward
Date Received: 2/6/25
Source: Email (**tedd@recycledelnorte.ca.gov**)
Attachment(s): Yes, Non-text items incorporated into documents submitted to CalRecycle are not reproduced here
Comment:
Dear Ms. Vang:

Thank you for overseeing the development of these Zero Waste plans and CalRecycle's multiple efforts to solicit input from professionals working on these issues in California.

I write to you today as Co-Chair of the Global Recycling Council of the California Resource Recycling Association (CRRA). Since 1999, we have been promoting Zero Waste, Ending welfare for wasting, and expanding Jobs from design and discards. CRRA, founded in 1974, is California's largest and oldest statewide public benefit recycling association. It is the oldest and one of the largest 501(c)3 non-profit recycling organizations in the United States. CRRA is dedicated to achieving environmental sustainability in and beyond California through Zero Waste strategies including waste prevention, reuse, recycling and composting.[1]

Considering the early draft Zero Waste Principles, we offer the following comments:

1. When identifying barriers and opportunities, these reports should highlight how foundational principles common to zero waste and circular economy are to be implemented throughout the lifecycle of each product, including:
   a. Supports for recovery compared to supports for extraction/single-use
   b. Separation of organic and technical materials
   c. How CalRecycle will help each community continue to identify service voids and opportunities
   d. Maintaining safe capture and recovery capacities and clear labeling for every product introduced
   e. How pilot projects, demonstration facilities, training and certifications can support continuous system improvements
2. When considering the lifecycle of products, retaining highest/best function includes fostering maintenance, rental, laundry services, repair, restoration, salvage and resale. The plan should describe how such businesses might be better fostered and supported.
3. Facilities that foster serial dropoff, salvage, deconstruction, parts warehousing and resale can be essential to expand reuse. The plan should provide some discussion of the potential for such developments.
4. The report should include acknowledgement that illegal dumping and mismanagement of materials that escape capture and recovery undermine efforts to move towards Zero Waste, and so should address how illegal dumping and vehicular abandonment control efforts connect to zero waste policy development.
5. The introduction and proliferation of materials and composite products without any recovery potential are ongoing inherent barriers to Zero Waste, and so this plan should explicitly recommend how such problematic product and material introductions could be controlled or addressed in California. Proliferation of 3D printers are but one example.
6. The plan should ensure that MRF residue is measured and reported, with the data sent back to jurisdictions to help improve waste sorting, education, and collection programs. Additionally, this data should be aggregated at the state level to inform policy development and strengthen Extended Producer Responsibility (EPR) programs. By highlighting problematic materials that evade recovery, this information can also be used to hold producers accountable and encourage better product design. This feedback loop will support more effective waste reduction strategies and guide future policy decisions.
7. Policy Alignment and Standardization – The report should discuss aligning local, state, and federal policies to reduce regulatory inconsistencies that may hinder Zero Waste progress. It should also explore standardized definitions, reporting requirements, and best practices to ensure statewide consistency.

8. Equity and Environmental Justice Considerations – Zero Waste policies should ensure equitable access to recycling and reuse infrastructure, particularly in underserved and disadvantaged communities. The report should address how funding and policy support can close service gaps and mitigate disproportionate environmental impacts.

9. Data Collection and Metrics for Continuous Improvement – The plan should incorporate data-driven decision-making by establishing clear metrics and reporting structures to track progress towards Zero Waste goals. This includes requiring material flow analysis, contamination tracking, and diversion rate benchmarks for communities and businesses.

Attached to this letter is a survey summary. The Global Recycling Council developed and promoted this survey to gather input to augment efforts by CalRecycle and its contractors. This survey was promoted through email list-serves including CRRA, SWANA, and the Rural Counties' ESJPA, though all submittals were voluntary and without compensation. A summary of this survey is attached, and you can examine results in detail here:
https://docs.google.com/forms/d/14VaGSPyAQj4tX1E8LRx4qabG8EyIViOzNLIagrCcbrA/edit#responses

In summary, respondents supported that California's Zero Waste Plans recognize the Zero Waste definition promoted by the Zero Waste International Alliance (59.6%), and that these plans detail how California can achieve a circular economy that is consistent with Zero Waste (85%). Respondents strongly supported more funding for Zero Waste policies, programs and infrastructure (97%), with strong support for expanding EPR programs (84%) or funding such support via advance recovery fees (84%). The survey also explores barriers, opportunities and essential programs or facilities, with specific suggestions regarding how to expand producer responsibility, infrastructure, incentives and funding, and considerations of bans.

In CalRecycle's public workshop on 24 January there appeared to be a keen interest in potential examples of potential programs or opportunities. Towards that end, we suggest your contractors contact Stephanie Barger of TRUE, and the US Green Business Council. With over 500 TRUE Certified facilities in over 47 countries and 115 Certified facilities in California, TRUE has the case studies, partners and resources which the California Zero Waste Plan can cite as models to be considered for replication at a statewide level. Businesses that adopt Zero Waste are not only changing their operations but educating and training employees who take it to their homes and communities. Suppliers are also very engaged in helping their clients meet Zero Waste goals while implementing Zero Waste practices. She may be reached at: **sbarger@usgbc.org**

Respectfully,
Tedd Ward, Co-Chair
Global Recycling Council
Of the California Resource Recovery Association
Attached: Summary of Global Recycling Council Survey Responses about CA Zero Waste Plan
With over 500 TRUE Certified facilities is over 47 countries, USGBC is growing their zero waste programs to support all industries. TRUE has also developed robust certification for events and construction site operations. TRUE businesses save $100,000 individually and collectively millions and more importantly create good, clean and safe jobs. They work upstream by purchasing only materials
Just like LEED Certification has expedited the sustainability of buildings in California (with a 75% diversion rate), TRUE enhances the operations of a building by focusing on redesign, reduction, reuse, repair, repurpose, etc. Not only do the companies achieve over 90% diversion but their policies and practices meet and exceed California and most federal and global laws. With over 115 Certified facilities in California, TRUE has the case studies, partners and resources which the California Zero Waste Plan can implement at a statewide level. Businesses that adopt zero waste are not only changing their operations but educating and training employees who take it to their homes and communities. Suppliers are also very engaged in helping their clients meet zero waste goals while encouraging the suppliers to also implement zero waste practices.

- TRUE for Construction: With the guidance of this certification, we have two facilities in California that have reached over 90% diversion from landfill, incineration in the environment at their sites.
    - Gensis Marina – built on a landfill in the Bay area, this beautiful facility provides a road map for others to follow.
    - Contra Costa County Building – A great example of destruction of old jail and other facilities, Contra Costa County exemplifies what can be achieved with a zero waste goal is set at the very beginning of a project.

- UC Berkeley – Gateway Project – Precertified with completing in less than two years. By working closely with UC Berkeley staff and students, the architect and contractor are meeting their goals. Innovative practices such as utilitizing trees from site to be made into furniture; construction trailers on site are zero waste, all contractors are trained and information provided in Spanish.
- Large food service provides, event venues (stadiums) and ski resorts are switching to reusable dishware and installing the infrastructure to support (dishwashers, storage, training).
- Napa Zero Waste Collective – is a group of wineries who are taking responsibility for all the materials they bring into the community. By source separating materials and working directly with reprocessors, they are:
    - Saving $100,000 to reinvest into their businesses
    - Obtaining ZERO contamination of materials
    - Innovation in reduction and reuse

Over 60% of materials are closed loop /circular process while the other 40% is downcycled but working closely with vendors to develop closed loop processes

A focus on educating businesses about the material markets allows the reprocessors to expedite the growth of their markets, develop efficient routes and close the loop on valuable resources. Businesses also appreciate the efficiency and money saving opportunities by shifting to reduction and reuse versus recycling. The zero waste community, including TRUE, has many resources, case studies and the infrastructure to facilitate a circular economy for all with the support of CalRecycle.

Summary of Global Recycling Council Survey Responses about CA ZW Plan (2/6/25)

The Global Recycling Council of the California Resource Recovery Association circulated a survey to obtain input on Zero Waste policies, programs, and infrastructure from California municipal representatives, service providers, non-government organizations, and Zero Waste advocates. This is a summary of the responses to questions.

1. The internationally peer-reviewed definition of Zero Waste (curated by the Zero Waste International Alliance and recognized by US EPA, CRRA, and Zero Waste communities across the country) is: " Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health."
   Should California Zero Waste Plans recognize the internationally peer-reviewed definition?
2. Should the Zero Waste Plans detail how California can achieve a circular economy that is consistent with Zero Waste?
3. In the Zero Waste Plans, what new or expanded services will be needed to address each product or material currently being discarded? (check all that apply)
4. In the Zero Waste Plans, what sectors need more focus for new or expanded services to get to Zero Waste? (check all that apply)
5. Would you support developing more funding for Zero Waste policies, programs, and infrastructure at the state level?
6. What are the primary barriers or opportunities to moving California's material economy towards Zero Waste? (check all that apply)
7. What policies, programs or facilities do you feel are most essential to support and expand reuse, repair, and refilling in California's economy (check all that apply)
8. California is a leader in moving towards high diversion through existing state and local policies and legislation. To have California achieve Zero Waste, what policies and legislation are missing?
    a. More Producer Responsibility
        1) More requirements on manufactures to design for recyclability. Reverse logistics for reusables.
        2) Producers need to be held accountable and not produce items that cannot be recycled or reused. There also needs to be consistency in where items can be collected or taken for proper recycling.
        3) We need to turn off the manufacturing faucet! Stop making so much stuff and let's get by with what already exists.

4) The State needs to enforce the laws it passes correctly and make sure manufacturers are responsible for the products and packaging they use instead of placing the burden of recycling mainly on local governments and waste haulers
5) Holding manufacturers accountable and actually enforcing zero waste requirements like CalGreen and bag bans.
6) More EPR!
7) Require manufacturers to design for durability, reuse, repair or be required to pay a reuse/repair fee to stimulate/enhance this sector.

b. More Infrastructure
1) Infrastructure and alternatives that can incentives people to make and support the shift towards zero waste
2) More recycling infrastructure
3) Lack of attention to handling green waste in rural jurisdictions.
4) Reuse, and Recycling infrastructure
5) Policies on supporting rural jurisdictions in implementing this goal and legislation creating funding to aid in this and implementing the program
6) Policies should prioritize recycling market development by investing in infrastructure that strengthens the domestic processing and manufacturing of recycled materials, creating demand for post-consumer content. Additionally, legislation should support the responsible implementation of advanced recycling technologies, such as pyrolysis, to convert hard-to-recycle plastics into valuable resources while maintaining strict environmental safeguards. Incentivizing innovation in reuse systems and expanding Extended Producer Responsibility (EPR) policies would also ensure a holistic approach to waste reduction and circular resource management.

c. Incentives, Funding, and Regulations
1) Internalizing the true costs of consumption and global production while ensuring everyone has their basic needs met
2) more incentives for creating reusable products, more barriers for single use products, more regulations for what each hauler and recovery facility needs to take standardized across the state
3) Less strict regulations since reusing, recycling, or disposing of products is hard.
4) Require and fund reuse in closed loop systems (schools, stadiums, food courts etc); Recycling and composting infrastructure availability and accessibility; EPR and widespread accessibility to drop-off sites and increased curbside programs to increase recycling of hard to recycle items
5) Sustainable funding for reuse and recycling programs. Fix broken bottle bill/fund redemption centers. Enforce existing rules.
6) Enforcement city level to residents. Enforcement and fines. When it costs they will change it.
7) thorough enforcement rather than additional laws

d. Bans
1) California needs to outlaw plastics. no more embedded batteries
2) Ban single-use plastic water bottles
3) Further restrictions are needed regarding the sale of products that are likely to increase litter, plastic pollution, or are constructed in a way that inhibits separation and removal of batteries, liquids, or hazardous materials that should be separated prior to disposal.
4) PFAS legislation on products, Expanded Polystyrene processing, Public / private partnership / ownership of processing facilities & infrastructure, Financial incentives
5) Policies related to mitigating overproduction, especially as it relates to plastic production, as well as toxic chemical production like pesticides, and PFAS.
6) Those noted above plus sustainable purchasing and pollution prevention policies and programs.

e. Other Zero Waste
1) We have to continue to work towards balancing CEQA with our climate goals. CEQA is extremely important and the measures sometimes do not go far enough to protect our environment, though, it is also a major hurdle in building additional systems & facilities

that further zero waste. We also need to remember the "less sexy" ways to achieve zero waste, such as building, educating, and encouraging more jobs in Trades industries, reducing the wasted energy involved in fossil fuels and incentivizing clean electricity & associated appliances, working towards an encompassing, financial business plan for opening, maintaining, and not continually operating on a margin, bulk & refill stores, and how to incorporate bins that are made of durable materials aside from plastics.
        2) Refill laws
        3) Something to do with textiles and take back programs for fast fashion companies.
    f. Not Zero Waste
        1) A place should be made in CA for pursuit of incineration and conversion technology projects. To limit their appropriate use harms the environment and does not align with reducing the impacts of climate change. It's time that steps are made in this direction.
9. Please provide other ideas or suggestions you may have for the California Zero Waste Plan and Rural Zero Waste Infrastructure Plan.
    a. build infrastructure to handle all recyclables in the manufacturing's State and stop all plastic manufacturing
    b. Better transfer of waste. Working with local businesses so rural residents do not have to go far to recycle an item properly.
    c. We need to put REUSE and REPAIR on a pedestal so all can be exposed to it. Add repair classes to high school curriculums.
    d. We need to have realistic expectations and protocols that are not so extreme to have organizations be able to process materials that are difficult to recycle, reuse, or final disposition.
    e. Increased visibility of the workshops surrounding the planning for this plan; Public conversations/transparency with the consultants conducting research on for this plan
    f. Exclude green waste management for wildfire management and defensible space compliance from Zero Waste calculations/requirements.
    g. fund the necessary programs and infostructure
    h. Collaborative listening/discussion sessions in communities throughout CA to educate the public and enlist their support in creating a ZW plan
    i. Compost infrastructure should be funded more like wastewater treatment plants through invisible fees in the utility bill. Expand and improve utilization of bio resources in agriculture, but also for restoration, revitalization, erosion control, and other land applications. Work with CARB on implementing protocols for carbon credits through equation activities involving by bioresource utilization/carbon farming.
    j. Require smoke shops and other vendors of cigarettes and vapes to have mandatory take back programs funded through a fee on the sale of single used batteries in these devices.
    k. Ban single-use plastic water bottles
    l. Until designated areas are established in each County for accommodating and providing services to the unhoused, more planning is needed for systematic collection, disposal and recovery of materials, food packaging, and other items distributed to the unhoused.
    m. Highlight & celebrate rural communities & businesses that implement ZW models for replication & expansion, Seek out ag infrastructure that can be adjacently beneficial to create other solutions, Consider alternative terms & vocabulary that speaks to the rural-suburban communities & those viewpoints
    n. Additionally, legislation could support the expansion of reuse and refill infrastructure statewide, incentivizing reusable systems and community-level composting programs. Stronger mandates for plastic reduction, comprehensive support for recycling market development (listed above), and increased funding for education and enforcement are also essential to close the loop and ensure consistent implementation of Zero Waste practices across all municipalities.
    o. I'm an engineer, not a planner.
    p. Require more state agencies to buy reuse systems, recycled and compost products.
    q. Create a realistic time line to develop and implement these programs. Don't just pick a year like 2030 and say we expect 100% compliance by this date.

Listening Session (Public Sector) – March 17, 2025

Comment 1:

Name: John Davis
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
Are we talking about the full life cycle of products, what are the factors? Human health? How do we treat the different factors for a life cycle analysis? Align definitions with climate, human health definitions. Should be precise enough to measurable and allow different approaches to be actionable.
Recommendation B
Pathway 1, Buy recycled program, have the focus on repairable products and have that be a criteria of the program. Focus on repairable products and stand behind the ability to repair. Not necessarily just CalRecycle.
Pathway 2, “valuable” means we focus on cardboard and not flexible packaging, that is a limiting factor. We are recovering high density poly but not film plastic.
Recommendation C
Valuable materials, the cost of recovering a material may exceed or be less than disposing the material. There’s still a lot of clarity that’s needed for new or ongoing costs. The cost of carrying out a zero waste plan will be focused on materials. The burden is on the rate payers, SB 54 opens the door to help with ratepayer costs. Oregon has incremental cost. At some point, need to circle back to the value judgement and cost and consider that to help locals. There’s only so much we can do at the local level. We can’t all do separate producer responsibility programs. Producer responsibility can’t be implemented locally, that state needs to take the lead. (Pathway 1). Understanding the fiscal nature within CA as a way to start. Use that to decrease the burden on ratepayers.
Recommendation D
SB1383 procurement has changed the value of the products. The farmers are getting paid to take the material on the cost of the ratepayers. There’s a risk in getting too far into these market solutions at the state level. Pathway 3 is where the state could step in through the procurement process to demonstrate the efficacy of the products. It has taken a very long time for Caltrans to use compost. Don’t want to intervene with successful markets. Price signals are hard to do from the public sector.
Recommendation E
Pathway 1, the Commission on Curbside Recycling has a recommendation on permitting and a unified permitting approach. Take a look at that and the CalEPA approach that wasn’t successful. Need to engage the local permitting agency in the discussions. If you brought a paper pulping project to a local government in CA, no one in the office would have seen that project. CalRecycle developed a programmatic EIR for Anaerobic Digestion. All permitting is local. There needs to be that avenue of expertise.
Second recommendation from Commission was on the CEQA process and how they don’t talk about the benefits of reduced GHG in projects. Community engagement is key here. CEQA varies by project to project. We still see CEQA analyses for composting that do not talk about the positive benefits of composting. Look at what CEQA has around the direct impact on a community. For example, someone had a site in mind but was in a commercial zone. Lack of siting is likely not the issue. CA has high land prices, labor, energy—these are more of a detriment than siting.
For pathway 2 consider a feedstock analysis. Where is it going? Where is it generated? You could pull together General Plan designations for industrial properties for feedstock sheds and it would be revelatory to know what material is not being captured in CA.
Recommendation F
Pathway 1 and 3, new materials need new solutions. The goal should be to enhance the performance and efficiency; whether it’s new or existing is not as important. It’s hard to drop equipment to an existing facility without creating impact. Who is paying for the costs? For example with PET thermoforms, who would be paying for a new versus existing facility?
Recommendation H
Markets are important, we don’t want to just collect stuff without a market. Agricultural markets (agricultural film) is an example.

Recommendation K
Interstate cooperation is missing on Pathway 2 so that word should be added. It's important that there is information sharing between states (e.g. CO and OR for packaging) and not just within a state or between countries. For example, who is a producer, what are the responsible end markets? What does a responsible end market entail?
Pathway 1 needs to have Nonprofits and NGOs added. There are a lot of opportunities beyond those driven by the industry. Pathway 1 seems like it's more focused on private enterprise.
On the point of common goals and costs, this was missing in recommendation J. We want some commonality of issues addressed. Not just private enterprise, but other approach about supporting NGOs.
Recommendation L and M
The university and state college systems are essential. That should be a focus for California. Riverside has a program that tries to bring knowledge to policy. "https://sciencetopolicy.ucr.edu/"
I've worked with community colleges (local) on solar panel repair. It needs to be packaged a certain way for them. Broad topics don't have an angle. Directed and applied research is focused on a specific issue. To research plastic recycling, what does that mean? Narrowing the focus is important. What are the essential public policy issues that benefit from more directed research? Don't forget grad students, they are our future. How do you scope it?
Recommendation O
Reaching the audience, but the question is "about what?". That's missing here. The barriers, this follows that. It's the behavior. But, what's the potential impact on changing behavior? And, there's a big gap between. Where you focus on what is timely or important to a point. Don't just jump to messaging. In Recommendation I, it's based on geographic and demographic trends as opposed to putting the right stuff at the right place. Limiting to geographic and demographic means you miss the barrier identification.
Recommendation Q
Have more data reporting only if there's a necessity for data. We need to understand what the utility of the data is. What do outputs look like? What kind of super computers do you have analyzing it? Assessing effectiveness of programs at some level. There's a lot of utility to that data when it is timely. It is about the local granularity.
Recommendation S
Related to granularity of the data, aggregated data at the statewide level does not help when you're trying to design programs. Answers might sit in your data but it needs more granularity. Being able to regionalize or localize data would be welcome.
Other Comments
One thing that we did not hear about was the enforcement of labeling, CRV redemption at retailers, etc.

Comment 2:

Name: Gary Liss
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A.
What is the definition of zero waste and circular economy? Definitions are important. There's a definition for zero waste that is posted at zero waste international alliance.org. There is a distinction between definition and description. EPA provided the international zero waste definition and then provides other descriptions of zero waste and go into other types of factors. Save our Seas 2.0 adopted by congress had a definition of circular economy that is pretty good. The Zero Waste International Alliance developed a definition of circular economy that is better. Ellen MacArthur foundation has a lot of resources/diagrams. Avoid leakage in the definition/diagrams to landfills and incineration should not be included.
Recommendation B.
Need to define whether the focus is solely on non-hazardous solid waste, or whether includes hazardous waste, and wastewater residues. Missing certification in the pathways. There are many certifications such as green building council TRUE and global zero waste program (Columbia), ZWIA national certification, Zero Waste to Landfill certification program. How are they structured, what their values are is critical to the success of achieving the right policies moving forward. Need to define what types of materials you are focusing on. ZWIA focuses on non-hazardous waste. Some certifications include hazardous materials. On pathway three, we need policies about design, is that part of your source reduction or could be a different

pathway. Policies that encourage redesign of products (SB 54), people need to rethink the products they are using. Policies that focus on the upper hierarchy of best use.
Recommendation C
A tool for addressing financing of facilities is Contracting for Services. MassDEP has a great model for Recycling Dividends Program to help fund program improvements. State involvement for contracting for services. On local governments to figure out. Massachusetts dividend program, Municipal assistant Coordinators (MACs) work with each entity to structure proposal, bid docs, model RFPs and contracts, can get money for food waste recovery. If you meet requirements, then get state funding. Work with each community when contracting for services. Model contracts provided to help communities get help. CalRecycle has not been involved in this but is done in other states. Many contracts result in new organics programs and facilities.
Recommendation D
Contracting for Services could be another pathway forward. Support contracting for services could be here in Pathway 2 or in the previous recommendation.
Recommendation E
Should be clear that it is not just for recycling/composting infrastructure, but also for redesign and reuse and fixit clinics. Reuse doesn't help on diversion goals but the value is reinvested in the community.
Infrastructure should be delineated that it's for all zero waste infrastructure. Berkeley Zero Waste Center is a good example. Public private R&D centers with university involvement. Helps them eliminate future waste by examining products for redesign.
Urban Ore in Berkeley is another good example. Developed a resource overlay that facilitated the movement from original site to an old industrial site. Urban Ore worked with City Economic Development folks instead of Public Works, helped facilitate moving to a different area. Harnessing RMDZ expertise to help facilitate addressing zoning issues.
Reuse, repair, refill. Infrastructure should be delineated for the full spectrum needed. Break the analysis of challenges into the various buckets (different pathways for each bucket).
Recommendation F
Incremental costs with SB 54. Focusing on incremental versus total costs. If there's existing capacity, it might not require funding. Would be helpful to have informational database and application, to see where there's capacity regionally.
Recommendation G
Distinguish and add finished products and services to Pathway 1, need to distinguish between products and services.
For good examples of small scale circular business successes, see San Diego Zero Waste Symposia over the past several years. They have highlighted MANY of them working entrepreneurially in that area. San Francisco's requirements for apartments to meet diversion requirements. If they don't, they are required by law to hire ZW experts to help them design new services and provide improvement education and outreach.
Recommendation H
(regarding Craig's comment) Source separated doesn't necessarily mean additional cans, but just means keeping clean materials separated from mixed waste. Burning is not zero waste (anything over 212 degrees F) and should not be included in the definition.
Recommendation J
On fast tracking permits, the Governor's Office of Planning and Research has worked on this. It would be good to learn from their experiences, and get recommendations from them about what has worked best.
Recommendation K
The Youth International Day of Zero Waste comes to mind (supported by UN Environmental Programme). They have an advisory board on zero waste. This is supported by something big. They have a textiles component that deals with "fast fashion". This is an example of an effort to collaborate internationally to promote zero waste.
Other national and international organizations on zero waste to work with: Zero Waste USA, National Recycling Coalition, U.S Composting Council, Race to Zero Waste, Institute for Local Self-Reliance, Zero Waste International Alliance, Global Alliance for Incinerator Alternatives, Global Zero Waste, Zero Waste Europe.
Recommendation L
Research and Innovation actions were included in both the Palo Alto and Boston Zero Waste Plans.

One of the key components about the Boston zero waste plan was about innovation. Take a look at all of their details in their plans. Take a look at the academic partnerships, what are the problematic materials? There is a San Francisco group that is doing collaboration amongst industry on innovative packaging materials. This is one example of the type of collaboration we are striving for. Sustainable Packaging Coalition comes to mind. CalRecycle working with these groups and helping to initiate those would be important. The role of government in convening meetings should not be underestimated. Mayors convening meetings is one of their most important powers. You don't need all of the answers, you need to bring people together who want to collaborate.

Public Private Partnership with academia to identify problem materials in an area, for industry to work collaboratively. One Step Closer to Sustainable Community has been doing this with industry. Examples of industry groups, such as Sustainable Packaging Coalition and The Recycling Partnership, are funding research. CalRecycle could work with them, convening meetings to get things going.

Recommendation M

Pursue grant proposals together with colleges and universities. A grant may be to set up a network of scholarships at different levels of universities in California. This would be real attractive to funding agencies. In 2005 – 2006, CRRA worked with a community college to get $5 million from US Dept of Labor to develop certified training programs. Santa Monica College is still offering that program. This is still going now and it has been a great resource. They developed national standards (NRC National Standards Certification Board) and certified programs still exist. Student learning outcomes from this is all about Zero Waste. This is a good example of a worthwhile system, worth replicating.

The Recycling Coalition Campus Council at San Jose State is another good example. We got inquiries about what we were doing around the world. It was all funded by a Department of Conservation grant. The ongoing funding came from the county, students keep it updated. These are good examples of this type of collaboration.

National Recycling Coalition has a campus council that needs to be reinvigorated.

University of Colorado would love to collaborate, so would many others around the country.

Recommendation O

I'm working with Native Americans in the Pacific Northwest. We emphasized learning about different cultures. There are differences beyond translation, such as trust, trusted advisors are key for engaging people. The EPA had an RFP for work on residential food scraps, composting, food waste prevention. There was a real emphasis on doing work with the businesses and communications. It's the small businesses at the local level where people know the individuals. Local governments also get the highest ratings on trust. The degree that you can do this on a regional basis, will be related to the success. We did a study back in 2000 on collaboration. Massachusetts came up with standard guidelines on getting people to "recycle right". If they come up with the smart guide they get funding. It would be great to learn from Massachusetts.

Recommendation P

In addition to communication tools, what about technology like AI to improve program implementation and analysis? This will be a quantum leap forward for monitoring what's going on. Is the wrong stuff going in? Is the right stuff going in? Feedback loop for targeted outreach and education to the sources who are doing things wrong.

Recommendation Q

The waste composition data by NAICS codes has been very helpful that CalRecycle has done and should be continued as a leading-edge example.

Recommendation S

Tap into studies being done at local level. EPA worked for decades to define waste streams and recycling streams and getting them into a common database. CA (largest economy in the world) contributions to the national database would be a pathway to pursue.

The current national database is called: **Facts and Figures about Materials, Waste and Recycling | US EPA**

Recommendation U

Engage Hollywood stars and talent to help in communications and community engagement!

Recommendation V

The Altamont Landfill is a great example of how community can be engaged, tool for empowering communities distressed over what is proposed. Community Monitor Committee hires a consultant that reports to them, and they evaluate reports sent from the landfill to regulatory agencies that highlight issues.

The Community Monitor Committee in Alameda County, CA was formed as a result of a Settlement Agreement that settled litigation over the expansion of the Altamont Landfill (owned by WM) there. Here's a link to the website for the Altamont Community Monitor Committee: **https://altamontcmc.org/**. There's a LOT of info in the Annual Reports for the Community Monitor Committee that can provide an example of the types of things that have been addressed over the past 25 years of this Committee. Here's a **link** to the 2024 Annual Report.
Other Comments
This is a framework not necessarily addressing all the details. One thing not seen is how to present all the information by sector, etc. Information should be readable by the lay person. Boston Zero Waste Plan, Baltimore Zero Waste Plan was the most cutting edge. Have creative graphics and creative innovations. Encourage CalRecycle to think who is the audience, legislator, media, average person.
Boston Zero Waste Plan: **https://www.boston.gov/sites/default/files/imce-uploads/2019-06/zero_waste_bos_recs_final.pdf** and Baltimore Zero Waste Plan: **https://ilsr.org/wp-content/uploads/2020/02/BaltimoreZeroWastePlan2020.pdf**
The owners of Zero Waste facilities being developed could be encouraged to meaningfully engage with the community, including conducting cumulative health impact assessments and entering into enforceable community benefits and monitoring agreements to ensure the facility does not cause adverse burdens and impacts on communities and community members' health.

Comment 3:

Name: Craig Cissell
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A.
More clarification of what is in "zero waste" would be great. Prime examples not sure if considered, large scale burn debris, mattresses with bed bugs (recyclers refuse material so this is landfilled), infected materials (avian bird flu, cows infected with mad cow). I like the idea of zero waste but see it as an impossible goal. There's always going to be some materials that will be landfilled. Rebranding to not be misleading and not use "Zero waste". Why don't you focus on packaging first? That is the biggest thing. And then work on the next biggest material like C&D.
Recommendation E.
In our county, there's a challenge making sure that there's enough zoning for these types of requirements. We don't have enough zoning for a material recovery facility. We are adding to GHGs by transporting waste so far. Need to verify that there is enough zoning for this to take place. To change zoning, it would have to go through Board of Supervisors and face the NIMBY mentality. To expand an already existing industrial zone into someone's backyard and increase odors would be a challenge. Would have to make some people suffer for the benefit of the community. Community engagement and collaboration and Best Management Practices could help.
Recommendation H
We need to have a value added product and create a value added benefit to the community. CalRecycle doesn't allow an opt out instead of transloading materials 60 miles away. Should allow a local area to create local compost. Our organics (green waste) at our landfill, we only charge $40/ton to burn it in an air curtain burner. If we mix food into that, we have to haul it out of the county and pay $60/ton. In developing infrastructure, what is that value added benefit that is cheaper?
How can we expand source separated materials? You will have to add an additional container and additional truck. I always fear adding an additional container as the hauler will charge more and there's more GHG. If you wanted to increase CRV, then you charge higher.
Recommendation V
Cleanouts of homeless population and materials from encampments are not sorted out before landfilling. Information is not provided of what is proper disposal.

Comment 4:

Name: Maile Lono-Batura
Date received: 3/17/25
Source: Listening Session

Attachment(s): N/A
Comment:
Recommendation B
Utility members are a critical infrastructure point. CA in particular produces the most biosolids in the nation. Pathway 2, Biosolids offer many ecosystem, circular water resources. CASA looks forward to moving these initiatives forward.

Comment 5:

Name: Perlita Castro
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation B.
In pathway 1, need a circular first lens. Focus on recommendation A to ensure that the circular first lens doesn't disregard existing policies in place that would make it difficult for smaller cities to implement. First lens should be flexible. Example for SB 1383: it's really proactive and would be feasible for cities like San Francisco that are already on the way. But for Clovis, we have to do much more education and it is much more difficult for us to meet deadlines.
Recommendation F
There may be unintended consequences if zero waste leads to facilities processing more materials and exceeding their thresholds. For example SB 1383 facilities that exceed their thresholds to process more organics. Let's say that a city already has infrastructure and then CalRecycle changes the requirements. If the facility is working and produces X amount of pollution, then CalRecycle changes the threshold and lowers the amount of pollution allowed, what is the facility supposed to do? Would the city have to change current infrastructure?
Recommendation G
Consider what is best and convenient for the ratepayer. What would the everyday person be able to benefit from and want to use? We do a compost giveaway so we can illustrate the benefits for the community. Find ways to directly show an immediate benefit to the ratepayer and provide access.
Recommendation O
This folds into the behavior recommendation. There can sometimes be a political divide issue due to different ideologies. Will need more uniform language, so that people don't get as upset. Non-political language is very important. Clovis is in the central valley. There can be generational divides in messaging. Narratives should accommodate this understanding.
Recommendation T
Need to ensure research conducted captures a wide geographic or demographic. Is there a way that the research can be further refined so that jurisdictions have a better understanding of what other geographic areas are like (regional differences on community barriers, challenges, beliefs)?

Comment 6:

Name: Victor Keroles
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation B
Regarding Pathway 2, will previous regulations be incorporated into the new Zero Waste Plan? Given that SB 1383 regulations are a priority for many jurisdictions, it would be highly beneficial to see simplified language if there is any overlap between SB 1383 and the Zero Waste Plan.
Recommendation C
SB 1383 implementation, would like to see a standard expectation of vendors/MRFs. With material recovery facilities, some require the material to be bagged. Disconnect from one jurisdiction to another based on requirements from material recovery facilities. Hard to communicate to residents if another jurisdiction doesn't have an increase in costs. Harmonize/standardize funding mechanisms.
Recommendation D

Pathway 2, one successful program was CRV recycling pickup from home. There was a CalRecycle pilot in 2022 for mobile CRV pickup. The City of Riverside partnered with them and got good feedback from residents. It was good to not have the burden on taxpayers.
Recommendation I
Pathway 1 is amazing and everyone needs to be at the table for that discussion. We have a partnership with a hauler to deliver material to our anaerobic digester to power the plant which benefits the rural areas. We need more partnerships to recycle organics.
Recommendation M
Link to what John mentioned for UCR: **Science to Policy**
Recommendation O
A possible action step. It's important to recognize who the audience is and CalRecycle's role in communication. For example, it's hard for a jurisdiction to communicate with a larger business. Buy in is needed. Liability wise, frontline staff not properly trained. Information and records kept at corporate level. It would be good for CalRecycle to have communication with large regional or statewide businesses. Maybe it could include sector specific training. Different jurisdictions being on different timelines could result in one city talking to a business, while another one doesn't. Communication is being distributed in a non-perfect way locally and would be best at a state level.

Comment 7:

Name: Adam Spaulding
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation H
Need definition of source separated material, definition of what waste is. There's agricultural waste that might be limited in terms of grant access and encompassed solutions. Make sure they hit the GHG goals (and incorporate fire fuel reduction into the solution).
When we are looking at waste at the MRF and landfill, there's a lot that happens on the front end before it gets to the consumer. We're trying to find a solution to attack all those sectors (fuel reduction, ghg reduction, transportation). Depending on what you want to do with organics, need incorporation of solutions with multiple different agencies, air pollution control district, regional water board, and calFIRE. Take organics into hydrogen, making composting, making additives for fertilizers. I want the opportunity for circularity (Pathway 1) not to be only on organic waste post consumer or waste of a certain type. Where we can constrain the opportunity, it makes it a lot harder to get a good solution.
Recommendation J
I want an accelerated pipeline for approval for these agencies. Approvals all take time. Municipalities and jurisdictions have different degrees of funding. The speed of which things are approved makes projects spend more. If we got approval faster, it could save projects money. If we can prioritize 1-3 items for fast tracking, we can get more investment with faster approvals. More predictable approval timelines could mean counties could more deliberately allocate their money.
Recommendation L
This ties into agency collaboration and pilot programs. Scale is important. For large jurisdictions, they may come together and come up with solutions that are larger and more expensive that don't work for smaller areas. We shouldn't forget about smaller opportunities and tons. Getting approval for small pilot projects is super critical for finding solutions and may be easier to pilot. These anaerobic digesters are expensive for us. The distance to locations, higher tipping fees, those go up the further out you are. That would be an incredible hurdle. The smaller community needs a proven solution. These solutions have to work. Streamlined solutions for smaller communities can be scaled up. But, large projects are difficult to be scaled down.

Comment 8:

Name: Debbie Gibbs
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:

Recommendation J
Nonprofit sector seems to be overlooked as a resource that can help CalRecycle and local governments and should be added to this recommendation/pathways.

Comment 9:

Name: Tobie Mitchell
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation J
This is a great thing to highlight in the Plan. The county recently started a regional edible food recovery program. Cities and counties all come together to meet the mandate in a collaborative fashion. An accessible, dedicated funding source on a regional, open-ended basis is important for us. Our funding is a regionally collected fee. This can be shared with peers. We can create regional/accessible funding mechanisms that are open ended that would help us create regional programs. In Southern California, I haven't seen as many joint powers programs. So regional implementation can be complex and needs more creative thinking. CalRecycle could be the conduit.

Comment 10:

Name: Gilbert Verdugo
Date received: 3/17/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation M
Open up more programs, more scholarship and grant opportunities, and facilitate that. There is a value in engaging with these programs including community colleges. Developing a thesis costs money. Request graduate student proposals for pilot projects or research projects that are funded.
Recommendation O
Some of the specific challenges include communicating the point across language. When expanding this for certain languages or vernaculars, some don't directly translate. Communication that is developed to the audience we are trying to reach is important.
Some of the regional difficulties with stages of implementation are important. Commercial haulers have to understand this, and it may be different than what we (city) recommend. This may change jurisdiction to jurisdiction. People learn behavior where they were at, then they go somewhere else and it's different. There needs to be standardization across the board. If there isn't this standardization, this will pose a challenge.
Recommendation P
I like the idea of bringing social media to the fold as an action step. Increase visibility. Visual learners are common, and it's easier for them to consume social media, certain ideas and levels of communication. Utilize these resources with Youtube or TikTok. Social media lends itself to opening up to a wider range of audiences. For social media, understanding what the approach would be, how would you be able to communicate. Short or full video? What's the tone? Those all factor in. You want to increase visibility and engagement on social media.
Recommendation T
Examples of how to track or keep an idea of how certain consumption trends. Collaborating with small businesses and understand what their challenges are to having more people participate would be interesting to look into. Engage the level of interest in refillable shops.

Comment 11:

Name: Maile Lono-Batura / Sarah A. Deslauriers
Date received: 4/9/25
Source: Email (**mlono-batura@casaweb.org**)
Email includes attachments: Yes
Comment:
Dear Ms. Heller and Ms. Morgan,

The California Association of Sanitation Agencies (CASA) appreciates the opportunity to provide comments on the Zero Waste Plan (Plan) proposed by CalRecycle. CASA is an association of California wastewater municipalities, often referred to as Water Resource Recovery Facilities (WRRFs), engaged in advancing the recycling of wastewater into potable water and the recovery and beneficial use of renewable energy, biosolids, fuel, and other valuable resources. Through these efforts, we help create a clean and sustainable environment for Californians.

Our members represent more than 90% of the sewered population, including more than 135 local public agencies focused on helping achieve the State's zero waste and climate change mitigation mandates and goals to:

– Reduce short-lived climate pollutant (SLCP) emissions by accepting and co-digesting diverted organic (food) waste from landfills under SB 1383

– Reduce carbon intensity of transportation fuel by using the biogas we generate

– Provide 100 percent of the State's energy needs from clean and renewable sources

– Increase soil carbon/carbon sequestration by land-applying biosolids and supporting the Healthy Soils Initiative, Climate Smart Strategy, and Wildfire & Forest Resilience Action Plan

Water resource recovery represents a significant segment of renewable resources available to California. In addition, water resource recovery generates clean water and offers a non-fossil carbon for renewable energy. The collective act of regenerating resources from treatment facilities demonstrates that realizing a circular economy is possible, given systemic support through regulation, programs, certifications, and platforms. By integrating these systems across locally available, value-added resources, we can move closer to circular economy goals in line with the State's Zero Waste plan.

One of the most effective methods of recovering resources from wastewater is land application of biosolids. California leads the nation in biosolids production, producing a total of 736,000 dry metric tons annually as of 2023. However, a recent report in Circle Economy found that 'of all the minerals, fossil fuels, metals and biomass that enter it (our world) each year just 8.6% are cycled back.'[1] Land application is the dominant and growing end-use in the state, representing a circular resource that helps to sustain nutrient cycling for nitrogen and phosphorus.

CASA offers the following general comments on actions that support the recommendations outlined in the Zero Waste Plan:

- **Aligned Regulations**: Identify and align the Zero Waste Plan with existing or future legislation that supports the Plan's goals. A notable example is California's SB 1383 organic food waste diversion from landfills.
- **Aligned Programs**: California's Cap-and-Trade Program is an example of potential program alignment with future expansion for Nutrient Trading programs on a larger state-wide scale like those in Maryland, Ohio, and Wisconsin.
- **Aligned Certifications**: Certification options for programs and products surfaced in the listening session. Exploration of possible certifications would enable circular economy goals by formalizing recognized regenerative resource pathways. The U.S. Composting Council currently has a Soil Testing Assurance program that certifies compost based on selected test results, regulatory standards for metals and pathogens, and feedstocks. In line with the circular economy goals of the Zero Waste Plan, California could lead the nation in product certification exploration for recovered resources.
- **Aligned Platforms**: A recognized hurdle in accelerating circular economy efforts is creating an accessible and affordable market platform for recovered resources. WRRFs across the United States are investigating options for regionalization to leverage resources across utilities and the greater community for industrial symbiosis opportunities.

These comments support the identified Zero Waste Recommendations and Pathways, however, are not limited to these:

- **Policy and Regulation**
    - B. Adopt a California circular materials management framework to develop and implement policies that prioritize source reduction, waste prevention, and proactive circular materials management
        - 2. Adopt state-wide strategy and associated policies to address influx of sources of high volume and/or valuable waste, or materials of concern.
- **Infrastructure for Circularity**
    - G. Spur the development and expansion of proven, equitable, and accessible circular business models for finished products.

    - 1. Facilitate the growth of new or expanded circular services (e.g., refill/delivery, lending libraries, repair businesses) that can become economically self-sustaining.

Partnerships

- I. Nurture waste-free community and economic clusters grounded in circular economy principles.
    - 1. Facilitate coordination for industry symbiosis clusters in areas of high-volume, source-separated outflows.
- J. Establish a culture of inter-agency collaboration that elevates circular economy throughout the state.
    - 3. Elevate the circular economy transition as a key avenue for meeting California's key environmental, economic, health, and equity goals.

- **Communication and Awareness**

- O. Tailor communication and education campaigns to audience-specific behaviors, barriers, and consumption patterns.
    - 2. Develop messages that motivate action by appealing to what matters most to audience group.
- P. Improve visibility and usability of circular resources and tools.
    - 1. Consolidate resources and tools to make them more intuitive to find and use.

- **Community Engagement**

- V. Foster open dialogue with community members to promote continuous and inclusive input from all voices.
    - 2. Develop and share opportunities for individuals and communities to actively participate in California's circular transition.

As long as society exists, there will always be a source of biosolids: we will all continue to flush our toilets. Through proper treatment, direct capture, and utilization, communities can access renewable nutrients and organic matter in biosolids that build healthy soils resilient to water scarcity. Biosolids offer a tool for improving California's resilience to wildfires – reclaiming fire-damaged land, improving water quality in impacted areas, and lowering the potential severity of future fires. Over 90 percent of California's municipal wastewater solids are treated through anaerobic digestion, increasingly offering a renewable energy source. Recycling of biosolids via land application is also recognized as a sustainable management option based in decades of research and practical end-use.

We request that CalRecycle recognize the potential of the circular water resources recovered from Water Resource Recovery Facilities (WRRFs) as an integral component of the Zero Waste Plan. To support the inclusion of biosolids, we provide the following citations of peer-reviewed scientific research. Specifically, we list citations that quantify carbon sequestration, offsets in synthetic fertilizer, and the ability to reclaim fire damaged land, all through the beneficial use practice of land application of biosolids. CASA is happy to offer additional research detail on biosolids beneficial use.

Carbon Sequestration

– Villa, Y. and Ryals, R. (2021). *Soil Carbon Response to Long-Term Biosolids Application*. Journal of Environmental Quality. **https://doi.org/10.1002/jeq2.20270**

– Tian, G., Granato, T. C., Cox, A. E., Pietz, R. I., Carlson Jr, C. R., & Abedin, Z. (2009). *Soil carbon sequestration resulting from long-term application of biosolids for land reclamation*. Journal of Environmental Quality, 38(1), 61-74. **https://doi.org/10.2134/jeq2007.0471**

– Torri, S. I., Correa, R. S., & Renella, G. (2014). *Soil carbon sequestration resulting from biosolids application.* Applied and Environmental Soil Science, 2014. **https://doi.org/10.1155/2014/821768**

– Antonelli, P. M., Fraser, L. H., Gardner, W. C., Broersma, K., Karakatsoulis, J., & Phillips, M. E. (2018). *Long term carbon sequestration potential of biosolids-amended copper and molybdenum mine tailings following mine site reclamation.* Ecological Engineering, *117*, 38-49. **https://doi.org/10.1016/j.ecoleng.2018.04.001**

Offsettng Synthetic Fertilizer and Increasing Drought Resilience

– Broderick, S.; Evans, W., (2017). *Biosolids Promote Similar Plant Growth and Quality Responses as Conventional and Slow-release Fertilizers*. American Society of Horticulture Science, Vol 27: Issue 6, 794-804.

– Brown, S.; Beecher, N.; Carpenter, A., (2010). *Calculator Tool for Determining Greenhouse Gas Emissions for Biosolids Processing and End Use.* Environmental Science & Technology, 44, 9509–9515.

– Sullivan, D.; Cogger, C.; Bary, A., (2015). *Fertilizing with Biosolids*. A Pacific Northwest Extension Publication Oregon State University, Washington State University, University of Idaho.

– Sylvis Environmental, (2009). *The Biosolids Emissions Assessment Model (BEAM): A Method for Determining Greenhouse Gas Emissions from Canadian Biosolids Management Practices*. Technical Report., 1–200.
– National Academies of Sciences, Engineering, and Medicine. 2024. *Exploring Linkages Between Soil Health and Human Health*. Washington, DC: The National Academies Press. **https://doi.org/10.17226/27459**.
– Evanylo, G. et al. (2006). *Biosolids Impact on Tall Fescue Drought Tolerance*; Journal of Residuals Science & Technology, Vol 3, No 2.
– Zhang, X. et al (2008). *Impact of Biosolids on Hormone Metabolism in Drought-Stressed Tall Fescue*. Crop Science, Vol. 49.
Reclamation of Fire Impacted Land with Biosolids
– Meyer. V.F. et al (2001). *Biosolids Applications Affect Runoff Water Quality following Forest Fire. Journal of Environmental Quality 30:1528-1532.*
– Meyer, V.F. et al (2004). *Plant and Soil Response to Biosolids Application following Forest Fire. Journal of Environmental Quality 33:873-881.*
– McFarland, M. J. et al (2009). *Restoring Fire Ravaged Land in California with Biosolids*. Australian Water.
– Crohn D.M. et al (2013). Composts as Post-Fire Erosion Control Treatments and their Effect on Runoff Water Quality. Soil & Water Division of ASABE.
In summary, beneficial use of biosolids derived from WRRFs is a critical path to achieving a circular economy and ensuring community resilience while remaining compliant with existing federal and local air quality, water quality, and land-related regulations. Without support for this practice, the natural carbon and nitrogen cycles will continue to be interrupted, and community resilience will be at risk.
Our members share CalRecycle's objective to move towards zero waste and transition California to a circular economy. We appreciate the opportunity to respond to your request for input and further appreciate your willingness to consider circular resources generated in water resource recovery as a practice that has proven to enhance the resilience of California's circular economy.
Please contact us if you have any questions at (916) 432-3551 or via email at **mlonobatura@casaweb.org** or **sdeslauriers@casasweb.org**.
Sincerely,
Maile Lono-Batura
Director of Renewable Resource Programs
Sarah A. Deslauriers, P.E., ENV SP
Director of Air, Climate, & Energy Programs
Cc: Mr. Adam Link, Executive Director, CASA
Footnote
[1] Circle Economy. Circle Economy Foundation News. accessed March 28, 2025. **https://www.circleeconomy.com/news/our-world-is-now-only-8-6-circular**

Listening Session (Waste/Recycling Industry) – March 20, 2025

Comment 1:

Name: Evan Edgar
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
Is there a definition for zero waste yet? Zero waste should include composting, digesting and bioenergy. A lot of definitions talk about circular economy, community input and cost.
We have targets that we're looking at. CARB tried that with GHG reductions. With the current Skinner bill/budget trailer bill it currently mandates 75%. The modeling should include a GHG component. We're looking for carbon neutrality and net zero, should include carbon footprint and model tonnages.
Affordability is an issue. To get to zero waste, costs would be upward of $100/household. Current 3-cart systems are about $35. As part of the modeling, is there a cost containment curve?
California wants to electrify, we need bioenergy. Bioenergy should be a key aspect of the policies to get to zero waste. Thermal technologies should be part of the goals. Biomass to hydrogen should be a huge part of this.

Recommendation B
Pathway 1 and Pathway 3 are great and inferred with EPR. There are a lot of great EPR programs (carpet, etc.) but those are usually lower volume. Definitely incorporate all of those programs, we talked at the last workshop that there are so many different EPR messages with material type. Some type of commonality across EPR programs would be helpful.
For Pathway 2, wood waste is high volume waste. We're trying to get the biomass program expanded. Each stream should have its own plan. The urban wood waste to hydrogen is an opportunity. Biosolids are going away, and SB 1383 has procurement targets.
What is recyclability? CalRecycle did a great job on the SB 54 regulations to work with statute, what is truly recyclable/compostable? Compost industry doesn't want to deal with wishful composting the way recycling industry has with wishful recycling. It's a big deal to define what's truly compostable.
Recommendation C
CARB is redoing cap/trade regulations and they're going to have a lot of movement to increase price of Carbon. It peaked out last February, in February 2025, it's down to $29/ton. The industry has over $1 Billion in investment, which goes a long way. How to get cap/trade money back to CalRecycle? This could be an action step. The allocation of money is used for other projects rather than tied to GHG emissions. There's an emerging trend for nuclear – to have it part of this plan doesn't make sense. You can't take organic waste and translate that to nuclear. I think that would muddy thing up – nuclear is more of the energy department's role.
Recommendation D
Local governments control a lot of franchises and they're responsible at the end of the day to fund it. What is the public sector response to these recommendations? Did they come up with any ideas? What is the affordability index for a family?
Recommendation E
Issue with emission/reduction credits. I've been involved in projects in San Joaquin Valley where emission reduction credits have killed the whole project. Down in Tulare, that could range up to $5 million in emission/reduction credits. Being called a "new source" without understanding that we're diverting from a landfill is what is killing the compost industry.
Environmental Impact Reports for new composting facilities are not taking into account that these facilities are diverting GHG from landfills and are seen as new generators. A programmatic EIR showing the net benefit of composting for GHG could be a pathway or action step, with CalRecycle grant to help cover the cost of that.
If we can get air permits that would help - paying that much money for emission/reduction credits is killing compost projects.
Recommendation F
Talking about the blue cart/MRFs – CalRecycle issued a recent set of Quality Incentive Grants (QIG). What we're seeing is robotics and AI is coming in to identify different materials. Grants for QIG is a great example of putting money back into the system to get better quality. We need to have cleaner feedstocks; we can't dump on China/Asia anymore. AI/Robotics, coupled with better definitions of what is recyclable is the next step in order to process recyclables. Better yet, education teaches people to clean up upstream in order to get a better product downstream. At least we can clean up our feedstocks for better manufacturing.
Recycling Market Development Zones – Bill and infrastructures for manufacturing in CA
Recommendation G
Pathway 1 is what we've been doing as a local circular economy – carbon farming. Carbon farming is a great circular model. Green waste goes down to Elder Creek, food waste is removed and goes up to a facility in Sacramento for carbon farming to enhance biodiversity, but the process takes a lot of money. Can apply for carbon credits, but there's a lot you have to do.
Recommendation H
There is no funding for edible food recovery right now. It needs sustainable funding.
Community composting is a gateway for a lot of folks to get into the compost business for training, community gardens, having that available for drop-off, etc., gives a lot of opportunity to local communities. Support is needed.
We're finding it hard to expand urban bioenergy. Community scale model to expand the bio MPA program, great bioenergy hub to be created throughout CA. We can't compost all wood waste. Bioenergy is the answer to have these microgrids for source-separated wood materials. It's local wood waste that's not imported, creating energy for the community.

Recommendation I
We do a lot of work with community climate action plans. All these plans are locally based, community scale. They have the same type of theme – 75% reduction, renewable energy, etc. They're promoting all these partnerships at the local level. Some cases (e.g. Santa Barbara CAP) get carbon credits and carbon farming. Sometimes they put in zero waste, but at least 75%. It's a great example of engagement and communication.
Pathway 1, Programmatic EIR for carbon farming with Resource Conservation District. First carbon credit program in the nation for natural working lands.
We work with CCA (Community Choice Partnership) instead of PG&E where at the local level, they're buying it at the same price and have a microgrid for resilience.
Recommendation J
What's the future of biomethane? Lack of coordination. On Renewable Natural Gas, there's a disconnect between the future of transportation fuel and a true circular economy. We have a linear system. Have CARB and CalRecycle work together on the future of biomethane.
We're trying to understand emission reduction factors. It's critical to understand the coordination on air quality, etc. because it should take 6 months to get a permit, not 6 years. AB 1045 legislation, organics waste management plan.
Recommendation K
We have cap and trade programs that set an example for the world. Internationally, there's been a lot of great stuff going on and CARB is a partner there. There are a lot of international programs we should continue.
Recommendation L
Pathway 1 - One of the emerging issues is in solids and composting and there's the whole PFAS issue of forever chemicals. There's eight states that are banning different levels of PFAS and biosolids and it's a forever chemical. The landfills and the compost are passive receptors. Composting is not a way to solve PFAS because it's low temperature. High temperature gasification destroys PFAS.
One of the emerging innovations is using non-combustion thermal technologies in order to take biosolids and wood waste. That would be an EMSW facility. CalRecycle has a permit type called engineered municipal solid waste. As part of SB 1383 process, you have to go through Article 2 to make sure the lifecycle is equal to or better than composting. I permitted 3-megawatt biosolids into EMSW facility in the city of Pittsburgh. It's a little bit more work, but it is innovation proof of concept that is happening elsewhere and coming to California. When you take the PFAS biosolids and wood waste, you can make hydrogen, you can make bioenergy. With the Gasification at certain higher temperatures – those technologies can destroy PFAS. I think that's a big emerging research innovation that solves a lot of problems.
Expand access to funding and finance solutions for circular innovation. That's where the carbon credits come in because when business is as usual, it is not really working to get the greenways out to the ranches. To finance it, since there's not enough money in the system in order to do that right now, by having carbon credits for funding.
Pathway 2, carbon credits for funding. CARB has the regulatory carbon credits which are different from the voluntary carbon credits in the NGO world. It's still robust and verifiable. Transparent and they have high integrity locally based nature-based carbon credits which are getting more valuable for ESG companies and environmental social governance to be carbon neutral by 2045. The Environmental Justice Advisory Committee may not like regulatory carbon credits because there are different criteria on big oil and utility, but the voluntary market is different.
Recommendation M
Pathway #1 Conduct outreach to the value chain representative team, a lot has been done with anaerobic digestion with wastewater. We're making a carbon negative fuel. There's a low carbon fuel standard, it is doing quite well for the private side because now we can put that carbon negative right back in the tank. Circular economy is disrupted due to cost of electrifying fleets. The public sector can't afford to electrify their fleets. We have to recognize the research done on carbon negative fuel and keep the public sector value chain of the circular economy alive instead of disrupting it. In the future, people are looking at hydrogen over battery electric. You need twice as many trucks at twice the cost. So now your rate is four times as much. Identifying research needs or sharing the research that's already out there to support initiatives.
We're ready to release a report on Biomass: The Hydrogen within a month.
Recommendation N

I've got three ideas. One is a hydrogen hub. That's where biomass to hydrogen is key, and the hydrogen could be a future transportation fuel.
The other one that we talked about already was carbon farming hub put on by the RCDs and California Natural Resources Agency - that is another great hub is to roll out carbon farming hubs throughout California rangelands and farms.
A third hub, these community compost hubs that have community gardens and SB 1383 procurement take back issues where that's going to be reviewed in the programmatic EIR coming up under the bill. SB 1046 is looking at small and medium sized compost operations impacts.
Edible food recovery is another hub and has come a long way. We work with about 10 different counties and they're doing some great work on how to grow and be efficient on different technologies and innovation. Communities coming together to do this, but it all comes down to the sustainable funding. It would be great to help fund it from cap and trade. That's a good bang for the buck too as part of that - cost effectiveness.
Recommendation P
For Pathway #1/2, I have four examples of action steps. One has been the climate action plan, cities and counties do engage with the public in the climate plan. They go out to the community every five years and that's a lot of community action going on.
Number two, we use greenhouse gas calculators to show that as part of a project EIR (for covered compost, anaerobic digestion, and bioenergy etc.), it's net zero GHG. We let the community know that this facility is the best available control technology. It's permittable under the threshold. It's not incineration or combustion - it's emerging.
Number three is a programmatic EIR and CalRecycle will be doing one for the carbon farming community compost. Planning departments have no idea on the technology, those programmatic EIRs for small scale compost and community compost and carbon farming will be a great resource. The fourth one is community benefit agreements. We see it as an outcome of getting a grant and community benefit agreement is direct community engagement for underserved communities in order to provide edible food funding or provide job training with a whole host of community benefit programs that we're implementing today.
Recommendation Q
There's the RDRS system and all this data goes into the system, but we get nothing out. Under SB 1016 we went to disposal based accounting; one of the reasons they did it was they then report back sooner than later. How much mulch goes in the LA desert in LA right now? What is going on out there? Where does all the food waste go on?
Recommendation T
Pathway 2, baseline report is based on tonnage. Zero waste goes beyond tonnages. Should look at other factors for resource conservation. Zero waste and circularity are two different things. Should include GHG. My firm did a GHG analysis previously. The baseline report should also include costs and fleet analysis.
Recommendation U
RCRC has a contract as well with CalRecycle for a rural plan. There should be some type of coordination and the same definitions or the same language. But there's a gap there where a lot of rural communities still want to do community composting. The hauler may not want to do it and they don't have to collect it.
Bioenergy and it's mostly in the forest sector waste, there's a lot of incentives and 20% can be urban waste. I'm promoting bioenergy everywhere at community scale and that's a big opportunity. That's why we want to expand the bio land program. Not only for renewable energy, for electrification, but for hydrogen.
Recommendation V
CARB has a committee called Environmental Justice Advisory Committee (EJAC) and they're standing advisory and we try to align policies with the scoping plan. I believe that's a great opportunity for CalRecycle listening to the Tribes and there are some Tribal voices on environmental justice community. Align your Zero Waste Plan with the scoping plan is key but I think that's an opportunity to get to talk to the EJAC folks because they would like to know about this.
On Pathway #1, it's really hard to establish channels and share feedback if we don't have a docket. We have no idea what other people are saying.
On Pathway 2, RMDZ folks would be helpful. Job training at community benefit level.

Comment 2:

Name: Peter Mui
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A

Comment:
Recommendation A
We have to factor in up stream costs of the items and that's hard to calculate, but we should really think about the term embodied energy. What are the upstream costs of mining, producing, energy, as part of the calculation of the true cost calculation.
As an example see **https://therestartproject.org/fixometer-2/**.
We also need to consider nuclear energy as an energy source.
Recommendation B
SB 244 (Eggman) right to repair passed 2 years ago that should be factored into any zero waste considerations because e-waste is the fastest growing domestic waste stream. Repair/reuse should be critical element around everything we do in the state.
Recommendation C
The biggest barrier to the adoption of the circular economy is the success of the linear economy: what if this Zero Waste Plan can herald in a new paradigm of hyper-local mass customization manufacturing on demand; a circular, sustainable future where most durable goods are designed, built, serviced, and maintained in a local service area using locally available tools, materials, processes and services?
This could lead to new innovative local employment and a way to keep the resources and the wealth of our communities circulating within our community.
I think my broader concern overall – this plan is trying to shore up down-stream solutions that are part of the existing linear economy system. We have to move upstream as quickly as possible. There are opportunities to think about how funding provides opportunities to stop the hemorrhaging. I worry that the Plan is putting a band aid on the problem when we have an opportunity to be radical and innovative here.
Recommendation D
There are efforts to document how reuse/repair impacts. People want us to measure tonnage in relation to repair efforts. Keeping a smart phone in service for 2 years might be more helpful than keeping a washing machine going. Weight is a weak measure in terms of diversion efforts. The scope of the plan needs to extend to other areas like workforce development. How does this impact us economically upstream instead of downstream?
Policies need to keep durable goods and existing infrastructure in place, in service at its highest utility possible for as long as possible.
How does any public sector funding encourage and support true circular economy innovation instead of shoring up what are fundamentally existing linear economy mechanisms (and their stakeholders)?
A cautionary addendum to Dan Knapp's story about solar: California's solar subsidy programs and policies unfortunately did not provide funds to support repair and maintenance of existing solar installations and has resulted in an enormous e-waste stream of removed solar panels.
Recommendation F
The problem is that we're not paying the true cost of the item at the moment of purchase: all of the upstream and downstream costs associated with the item are not factored in.
Recommendation G
Can Pathway 1 be more generally be framed as: Model and transition to the future circular economy where almost everything we consume is designed, built, serviced, and maintained in a local service area using locally available tools, materials, processes, and services, and kept at its highest utility for as long as possible?
Recommendation H
How can we change the emphasis towards longer term use and reusability?
Recommendation I
Partner with academics and citizen scientists on a continuous process of experimentation, measurement, and metrics to determine better ways of determining both the true initial cost of our consumption and the downstream mitigation efforts.
Recommendation M
Supporting R&D is aspirationally fine however: the devil is in the details e.g. how will the initiatives and associated organizations be chosen and their results measured?
Recommendation P
Two Repair Tools: In conjunction with the enactment of Right to Repair SB 244 (Eggman) Fixit Clinic hosts the Global Fixers server on Discord where anyone anywhere in California can start and/or continue an effort in repair. Repair.org also hosts a web site where California consumers can report efforts to get repair

information from manufacturers to be forwarded to the California Attorney General: **https://www.repair.org/repair-complaints**.
I'm in conversation with Google right now about how they improve their local search for repair. I think the challenge for both of us is that as if it feels like deprivation or sacrifice people aren't going to do it. So, it's about behavior change. Everyone wants the value signal that they're doing a good job. But when you watch them, they actually do something different because it's inconvenient. Shifting to circular is going to be expensive, we need to move to a more local circular economy (repair helps make this more feasible, eg. Not make new phones locally but fix them locally). We have these current linear paradigms that need to shift to circular paradigms. But it's going to be expensive and there's going to be winners and losers in that process. We need to move towards kind of a local circular economy which might fit well with this whole insularity at the national level that's coming down. But this idea that most of what we consume has to be designed, built, serviced, and maintained in a local service area using locally available tools, materials, processes, and services. Maybe the innovation is in the machinery. How do we look at our waste streams in California and not think of them as waste anymore but can be products that are used and replace things that come from very far away?
Recommendation Q
Kelvin said that when you cannot measure, your results will be meager and unsatisfactory, so collect as much data as you can but make it so that the data can actually be interrogated by everybody down to the level we can understand where it came from, who contributed to it. What the source was. I think if we could do more efforts to encourage crowdsourcing of data, especially data like this which is spread around then and there. And then allow for the methodology to be available so citizen scientists can get and can interrogate it and you can say well if you weigh this other factor more, then it sways it towards this solution versus that solution.
Make the data visible and transparent, crowdsourcing of data with clear methodology.
Recommendation T
I fear that in this environment of disinformation the ability to spread fear, uncertainty and doubt is great; we need better trust and reputation mechanisms overall, both amongst stakeholders and with CalRecycle itself. Anything CalRecycle can do to further convey transparency and integrity in these processes might have great positive effects.
Recommendation V
Is there an opportunity to partner with California Volunteers **https://www.californiavolunteers.ca.gov/** both to engage Californians in this drafting process and in implementing and executing any on the final document's recommendations?
For example, I wrote this module for California volunteers. CalRecycle is most welcome to promote this too: **https://docs.google.com/document/d/1KnsiQvHeNO5rt9wQrYEkQKi144KgcHlff8TgXB7eLik/edit?usp=sharing**
Lots of California School Districts have Climate Literacy modules at this point: could CalRecycle put together a program to engage those students in this process? There are aspects of that that might help inform this learning.
The City of Berkeley California is drafting a Zero Waste Plan now: perhaps there are aspects of that plan that might help to inform this plan?

Comment 3:

Name: Mike Caprio
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
The SB 54 process (eg., Covered Material Category list) is an example of something under this recommendation. The plan may not be fully zero waste as we may need other packaging solutions so that misalignment is something to keep in mind. What is the definition of zero waste?
Recommendation B
How does the zero waste plan support existing goals instead of creating a different set of goals/deliverables? Help other programs/regulations (SB 1383, SB 54) be effective.
There has to be common public education requirements. How to develop quality state-wide education as a template for people to use across the state?

If we're trying to get public participation, education should be clear and simple. Use visuals that are super simple have the best results in terms of contamination rates. Devise public education to be comprehensive and also not confusing.

Comment 4:

Name: Christy Pestoni
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
The interagency problem we have is not expediting processes together. The problems at air district and permitting issues to accommodate SB 1383 and SB 54 – we all have to get in alignment. There should be a timeline/clearinghouse.
Recommendation B
Education goes back to culture change and what we've learned from the EU – Economics, sustainability and culture change. Culture change is going to be the heaviest lift. One thing that we have talked about was color coding the packaging so that it aligns with the cart so that a kindergartener could figure it out. You don't have to stop at the container and consider which bin it goes in – whether you're in the airport, coffee shop- where does it go? Having a color, shape, dot will help align it for people. We need to see expanded facilities to process those materials, or an alternative like hydrogen.
Recommendation F
Permit streamlining is going to help with expansions in a timely fashion and the technologies that are going to be used. We talk a lot about going from HDPE plastic to flexible film, so we've sourced reduced, but we don't have an approved technology to recycle that new plastic. Food packaging has a health and safety requirement – is there an exemption for technologies if there's no harm/emission? We should be reducing emissions there, but new factories/facilities need to be built.
The generator has to understand when they're buying it that there's a cost associated with end of life. We're doing that with mattress, paint, sharps, textiles, why aren't we saying that everything that we purchase as part of this zero waste plan? How locally do we collect it locally? Is it a local tax, or a state tax? Everyone is responsible.
Recommendation G
Gaps include education--people need to know where to go to take stuff, whether it's reuse, refill or repair. The messaging on circularity needs to be very broad because right outreach and education is all fragmented.
Recommendation H
Not all facilities have pathways to biomass. Regarding the CalGreen building code, the 65% recycling requirement is difficult to meet, source separation of materials should have pathways to biomass. This creates a nexus to goals being met.
Recommendation J
We used to have a waste board comprised of interagency folks to get their programs implemented and off the ground. Can CARB/CalRecycle/DTSC come together with a timeframe to work with that's equitable and folks can finance that (banks, grants). CEQA has strapped projects for years.
Recommendation N
The Lawrence Livermore Lab spoke about carbon sequestration and they had a lot of ideas. So, I think that is a pathway for partnership and I'm sure there's other manufacturers that have labs that can do R&D.
And also, having on the website a shared library with data. Also shared comment letters like CARB does. Where all the comments are posted up and transparent.
Recommendation O
What are the barriers and what are the solutions and what are the solutions? The product design and consistent education and outreach; that's why I always go back to this color coded that matches the container color. I am interested in hearing from other states doing Needs Assessment first and learning first what are the issues with this education and outreach. It's confusing, so we want to get right the messaging on the education and outreach. You need to know behavioral information before you can start creating a product or a curriculum.
Create a research library and workshop on technology and innovations. There is organics in the trash bin and there is trash in the organics bin, so there is contamination in the blue bin and identifying that with AI is

really emerging. The consumer has got to care. I think when your trash bill costs as much as your cell phone bill and your Chromecast bill, I think that will also be a wake-up call.
Recommendation P
In the franchise system here, we partner with our local government and this is a collaboration on the outreach and education. There should be a template where you put your own logo on it. Having a mass campaign to talk about important topics (e.g. carbon farming, carbon sequestration etc) for a more targeted approach.
There should be a study to create a baseline of existing resources. We've talked a lot about the need for reuse and repair – and that could be the future research on what would it take to get regular people like me into that. Identifying repair cafes on a map and putting it somewhere and then letting each jurisdiction pull from that information so that they can put that into their outreach.
Recommendation T
Non profits, climate task force, solid waste departments, and haulers should be collaborating on this research.
Recommendation V
A lot of cities have Sustainable Transportation communities that are actually appointed by the city council. The green committees would be great partners. Communities are working with their hauler on which material types are collected, and this is where we're going to get to uniform information. Each community is different and all of these green ordinances need to work together.

Comment 5:

Name: Dan Knapp
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation D
We are a reuse business (40 yrs). We specialize in reusable goods; we handle about 8k tons/year. We only send half of 1% of what we handle to landfill. Our main building in West Berkeley is a former pipe manufacturing plant – we had to put a lot of money in to occupy it, then along came an opportunity to put solar on the roof (30k sqft). We ended up paying cash for everything, put brand new covering as part of the project, after that we put 265 solar collectors, which have operated for 3 years. PGE bill went down to $28/month. How many warehouses like ours are there in CA that could handle 1000 solar collectors? You don't need solar farms – you need them on the roof of these warehouses. What if all of those were generating power? You'd be using the power where it's generated. We need to think outside the box in this way. Covering the channels that run north to south – you put a roof on and cut the evaporation to save a ton of water. Put solar collectors on top of those and now you have power to run the farms. There are a lot of technologies that we can use to still have an industrial impact. I understand that might not be possible for everyone, but if you had financing for business owners to use, more businesses could implement these changes.
Key financial mechanisms that could help more companies like Urban Ore: Land, Labor, Capital. Land is a big problem in a lot of ways. We changed zoning laws so that we can be where we are. Zoning can really stop this in its tracks if it's not set up to recognize material recovery as a preferred use. The question is how you stick a great big thing like Urban Ore on this property – we had to go to the planning department to work with us. They came up with the term material recovery enterprise – we're a retail business and generate significant sales, so we're paying taxes and it's all coming from selling reusable goods. One of the most important principles that we followed – is that we do business honestly and play by the rules – you basically have a template for feeding tax money into the system so that you're paying for the traffic that you cause, etc. Everyone on staff is above mandated wage structure, which is supported by reusable goods. You need entrepreneurs that are willing to go out and battle.

Comment 6:

Name: Rhiad Gajraj
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:

Recommendation E
Our business model is building infrastructure to divert organics from landfill and turn into energy streams. We have assets in CA, coming from a representative as a party who can bring capital investment in CA to support SB 1383 goals. Looking at the context of new infrastructure, SB 1383 is a great initiative to divert organics.
One of the gaps-- SB 1383 is an equation and half of the equation is what to do with the diverted organics. It can be converted into compost, energy, etc. I'm finding that there is a lack of clarity of the pathway for renewable gas procurement. This is one of the places where there's multiple regulations. It's unclear to me how you prove that RNG procured from a project in CA meets SB 1383 procurement goals.
There is a lot of concern in terms of SB 1383 – how is it really being enforced at the local level, district, down to the household.
Education is very important; I encourage efforts to invest in educating children so that we can shift the way we think. We have to use every tool in the toolbox to meet these goals.
To prepare for SB 1383, there has to be grant funding for infrastructure to support these kinds of projects. Solar/wind went through the same thing, we need the funding to get infrastructure off the ground. One of the key mechanisms that France has is standard tip fees for compliant landfills, but those that bring comingled materials are charged an extra fee, which is put back into diversion infrastructure development. There are technologies to help the state meet these goals.

Comment 7:
Name: Naama Abramovitch
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation N
Checking with Atrium 916 would be a great example for a hub like that. It would be a great opportunity to talk about a hub for reuse.
Recommendation T
There are a lot of organizations already working in different communities on different things that can be helpful. Contact them and see how they can be included in these kinds of community engagements. In Napa, there is Napa Climate Now which is a great organization as well. Your local jurisdictions know about them because they've been supporting different initiatives that are in this field. I also believe that your haulers are doing a lot of the outreach and being a part of the community and would probably be another place that you can ask who those organizations would be.
Recommendation V
In the Bay area, they have an ambassador program to bring more engagement from the different people in their own community to educate them about the three waste streams and circular economy and all these topics. Creating these kinds of programs to really educate the community can help foster community engagements. The community is Antioch, and I can put you in touch with the person that is in charge of that program from that jurisdiction.

Comment 8:
Name: Frank Pharrel
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation V
Pathway number 2 - the R&D guys are great. RMDZ folks bring a lot to the table to talk about getting zoning and developing projects ground up so they're engaged. Building infrastructure now has been active for 15 years and we're still trying to build infrastructure now but mostly from the manufacturing side of paper and plastic and glass in California.
Maybe a follow-up for industry - creating the community-based agreement. Have you found any particular channels that have worked really well with listening input? Maybe the climate action plans that some jurisdictions have done to create community engagement - what can we learn from some of that? Job training, at the human benefit agreement level, at the climate action plan level, they have workshops all the

time. They promote greenhouse gas reductions and transportation and educating communities in the workshops. And everything we're talking about – everybody has waste diversion 75% to zero waste. Everybody has low carbon fuels. We already have renewable energy. Everybody has a path to recovery. Some of them are doing carbon credits like in Santa Barbara so each one of them – they get better and better each time and the communities are totally engaged in preparing it. You can always tie it right back to the Climate Action Plan. And again, a lot of support at the project level by recognizing that.

Comment 9:

Name: Lori Storey
Date received: 3/20/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation O
The mission of the Regional Recycling Group is education and outreach for California's recycling programs. Using social media platforms, this recommendation aligns with our mission. We work with jurisdictions to target audiences where the messages are most effective, using geotargeting features. I can see each of these three pathways as being very effective based on research outcomes.

Comment 10:

Name: Evan Edgar
Date received: 4/7/25
Source: Email (**evan@edgarinc.org**)
Attachment(s): Yes, Non-text items incorporated into documents submitted to CalRecycle are not reproduced here
Comment:
The Baseline Report for the Zero Waste Plan was submitted to the California Legislature as directed by July 1, 2024. The Baseline Report focused on baselining tonnage data and presented the AB 341 statewide diversion rate of 41% in 2022 where there is a statewide goal to divert 75% by 2020 and for organics, 75% by 2025. The Baseline Report should also baseline the Waste Sector greenhouse gases (GHG), the collection fleet, and the costs in addition to the tonnages.
Zero waste has been described in various ways by different entities, where CalRecycle needs to define what 'Zero Waste' means to California. The United States Conference of Mayors adopted the following principle to define zero waste:

> **WHEREAS,** the concept of zero waste goes beyond recycling and composting at the end of a product's life cycle, to encompass the entire life cycle of a product, beginning with product design, and envisioning the use and management of materials in ways that preserve value, minimize environmental impacts, and conserve natural resources; and
> **WHEREAS,** materials management through zero waste can begin to shift the fiscal burden of waste and empower industry to embrace resource responsibility by rewarding stewardship through purchasing and economic development incentives; and
> **WHEREAS,** while industry and the federal government have variously defined and categorized zero waste strategies, it behooves the nation's cities, with primary responsibility for waste management, to devise a definition that encourages shared fiscal responsibility and legislative innovations,
> **NOW, THEREFORE BE IT RESOLVED,** that The United States Conference of Mayors adopts a definition of Zero Waste, and set of Zero Waste principles, that recognizes a Hierarchy of Material Management

Beside just tonnage information, zero waste principles include resource conservation, rewarding stewardship, life-cycle assessments, greenhouse gas reductions, and shared fiscal responsibility. With the concept of zero waste gong beyond just recycling the composting, the Baseline Zero Waste Plan needs to include additional components such as the following:

1. **Baseline Net-Zero Greenhouse Gas Analysis**
2. **Baseline Fleet Analysis**
3. **Baseline Cost Analysis**

1. **Baseline Net-Zero Greenhouse Gas Analysis:**

In 2018, 27.2 million tons of waste was diverted from landfilling amounting to 43.98 million metric tons of GHG being indirectly avoided following the Federal EPA WARM model that embeds material lifecycle analysis into their calculations. Following CARB's Net-Zero Waste Sector GHG equation adopted in the 2013 Scoping Plan, the Waste Sector was 3.7 times Net-Zero GHG in 2018. The ***California Waste Sector Net Zero GHG Report*** prepared by Edgar & Associates was provided to both CARB and CalRecycle in May 2021, and has been ignored by these regulatory agencies in the development of the CARB's Scoping Plan and their Advanced Clean Fleet rule and the proposed Zero Waste Plan development by CalRecycle. This Report has provided valuable information regarding the current circular economy and achieving a 75% diversion rate by 2030 with the associated GHG benefits and can be utilized to provide baseline GHG information.

This Report also projected to 2030, that should SB 1383 and AB 341 goals be met, an additional 28.3 million tons would be diverted, to total 55.6 million metric tons of GHG being indirectly avoided, increasing to 10 times Net Zero GHG. The Zero Waste Plan needs to include a Net-Zero GHG Analysis based upon life-cycle assessments.

Baseline Fleet Analysis:

The collection of waste and recyclable materials typically amounts to 75% of the cost of a program with 25% of the other cost being post-collection processing and disposal. CalRecycle should model the refuse fleet component to achieve zero waste since the fleet will be transitioning to a zero emissions fleet with substantial costs and will recarbonize the fleet from being carbon negative utilizing renewable natural gas (RNG) from SB 1383 organic waste. The refuse fleet owners had been implementing the circular economy of today that CARB wants to replaced it with a carbon positive battery electric fleet transitioning towards global linear economy abandoning the circular economy.

The Waste Sector has been decarbonizing since 2000 with compressed natural gas (CNG) vehicles replacing fossil diesel in many communities, and renewable diesel is being utilized to replace fossil diesel. The solid waste industry has been producing our own renewable natural gas (RNG) from SB 1383 organic waste that is utilized in their own captive fleets and had no intention to produce biomethane for other hard to decarbonize industries. The solid waste industry has perfected the local circular economy that complies with SB 1383 by diverting organic waste from landfills, producing RNG from that waste and using the RNG in our own refuse fleets.

CARB adopted the Advanced Clean Fleet (ACF) Regulation mandating a transition to zero emission vehicles and away from RNG. CARB determined that the Heavy Duty fleets emit about 40 million metric tons of carbon dioxide equivalent (MMTCO2) in 2024 and decrease to about 18 MMTCO2 by 2040 with a 45% drop in GHG Emissions as shown in the CARB graph below. This should not be considered baseline information for the refuse fleet, since this data is for all heavy duty vehicles in California.

The baseline data for the refuse fleet shows 16,000 Heavy Duty vehicles in California as a subset of the ACF Regulations. The graphic below shows that since 2020, the GHG emissions have been cut 100% following the green line into carbon negativity. With the ACF Regulations, CARB will be re-carbonizing the refuse fleet following the orange line. Since 2020, the refuse fleet of 16,000 heavy duty vehicles has decreased their GHG emissions from 806,000 metric tons of carbon dioxide equivalent (MTCOe2) to a carbon negative 292,000 MTCOe2 in 2024 using RNG and renewable diesel. The solid waste industry was poised to be 100% RNG by 2030 where the GHG emissions would have decreased to a carbon negative 950,000 MTCOe2 amounting to 1,756,000 MTCOe2 in GHG emission reductions as shown on the green line in the graphic below.

Forcing electrification with the ACF Regulation, the solid waste industry will be re-carbonized where by 2042, the refuse fleet will be a positive 35,000 MTCOe2 of GHG emissions instead of being carbon negative at 950,000 MTCOe2 by 2030. The carbon intensity of California average grid electricity used as a transportation fuel in California for 2023 is **81.0 gCO2e/MJ** with the EER being 5.0 for heavy duty vehicles. The carbon intensity will decrease to **0.0 gCO2e/MJ** by 2045. With the ACF phase in and the California grid carbon intensity, the refuse fleet recarbonization is shown on the orange line.

California is unlikely to meet the 2030 climate goals at the current emission reduction rate while the Legislative Analysist Office that the 2022 Scoping Plan lacked clear strategy for meeting the 2030 emission goal. By adopting the ACF Regulations and phasing out near-zero engine options using RNG, diesel vehicles sales rise and renewable diesel supply continues to surge. CARB has dismissed the carbon negative refuse fleet solution that could have delivered as much as 950,000 MTCOe2 by 2030, but instead will push the refuse fleet into recarbonizing.

CalRecycle needs to model zero waste with zero emission vehicles as well as a 75% diversion plan with near-zero engines and using RNG and determine both the cost impacts and the GHG impacts, where it would show that zero emissions vehicles are carbon intensive and costly.

Baseline Costs Analysis

CalRecycle has published several reports of relative costs to implement programs including the following: *SB 1383 compliance could require potentially significant rate increases in some jurisdictions. The average cost increase to households is estimated at $3 to $5 per month, while the average increase to businesses is estimated at $70 to $90 per month.*

To implement SB 1383 with a standard 3-cart system, we see an average monthly cost of $35 to $40 per month using the current fleet. The average rate increases to implement the 3-cart system has been 20% to 30%. The costs to implement a zero waste plan with a zero emission fleets needs to be modeled compared to baseline to understand the relative costs to implement both these programs at the same time.

The zero emission vehicles lose half their payload due to the weight of the batteries and could cost twice as much, plus the electrical charging station will cost billions more. With the jurisdiction already passing significant rate increase to implement SB 1383, the jurisdictions should have the information on the potential rate increases to implement a zero waste plan with zero emission vehicles which could increase rates by 100%.

CalRecycle determine baseline costs and then run several models to determine the increase in costs to achieve the following mandates:

1. 75% diversion with a fleet of CNG vehicles running on RNG with the CARB certified carbon intensity values – for 2023 the average CI has been minus 119 grams of CO2/MJ.
2. 75% diversion while implementing the Advanced Clean Fleet rule using the CI value of the California grid to charge the battery electric vehicles.
3. Zero waste with a fleet of CNG vehicles running on RNG with the CARB certified carbon intensity values – for 2023 the average CI has been minus 119 grams of CO2/MJ.
4. Zero waste while implementing the Advanced Clean Fleet rule using the CI value of the California grid to charge the battery electric vehicles.

Zero Waste Modeling:

The CalRecycle Zero Waste Plan contract with Accenture models zero waste in 2035, 2040, and 2045 following the same CARB playbook on modeling carbon neutrality. CARB picked 2045 over 2035 and 2040 where CalRecycle should not expend resources on achieving an impossible scenario and should instead model the 4 scenarios listed above. CalRecycle should stick to modeling zero waste by 2045 and determine when the current mandates of SB 1383 and AB 341 of 75% diversion can be met. The Legislative Analyst Office agrees with the approach of meeting current mandates 75% mandate first. Since the AB 341 statewide diversion rate is only 41% in 2022, modeling zero waste in 2035 and 2040 would be futile while ignoring 75%.

I look forward to discussing this with your staff. Please contact me at 916-444-5345. Sincerely,

Evan WR Edgar

Regulatory Affairs Engineer

Add to comments due by April 9, 2025. Need to establish a Docket where all comments are posted and transparent.

From: Evan Edgar

Sent: Friday, March 14, 2025 1:11 PM

To: **zerowaste@calrecycle.ca.gov**

Cc: Vang, Sue@CalRecycle; Mindy.McIntyre; Heller, Zoe@CalRecycle

Subject: RE: Zero Waste Workshop - Comments are due Feb 10, 2025 - Net-Zero GHG Report - 2018 Data

CalRecycle:

Nowhere in the ‘Listening Session Discussion document’ is anything about GHG reductions and/or Net Zero GHG.

GHGs reductions should be driving what tons are being diverted and at what cost to get the biggest bang for the limited bucks.

This has been a comment from my office since 2021 when we provided CalRecycle a Net-Zero GHG Report for the Waste Industry.

CCC is talking and provided important information for years on this, and CalRecycle is still not listening how important GHGs are to the zero waste plan.

There should be linkage to CARB's 2022 Scoping Plan.
From: Evan Edgar
Sent: Friday, March 14, 2025 12:56 PM
To: **zerowaste@calrecycle.ca.gov**
Cc: Vang, Sue@CalRecycle; Mindy.McIntyre; Heller, Zoe@CalRecycle
Subject: RE: Zero Waste Workshop - Comments are due Feb 10, 2025 - The process is not transparent, stakeholders are not really engaged, and the comment process is not readily accessible
The Zero Waste Listening Session process continues to be constraint and not transparent.
There was a short window to sign up in advanced and only went to the Zero Waste listservs.
Zero Waste cuts across issues and should have been promoted on all listservs.
I brought this up in the email below, and the process is still narrow as mentioned before.
Please add these to the zero waste comments docket. CalRecycle, like CARB, should have a public docket process to upload comments and view other comments of record that can be easily facilitated on your WebPage.
Please design a public docket where all comments can be filed and viewed, as nobody really knows what the others are commenting on – since it is not transparent.
From: Evan Edgar
Sent: Monday, February 10, 2025 4:32 PM
To: **zerowaste@calrecycle.ca.gov**
Cc: Vang, Sue@CalRecycle; Mindy.McIntyre; Heller, Zoe@CalRecycle
Subject: RE: Zero Waste Workshop - Comments are due Feb 10, 2025 - Net-Zero GHG Report - 2018 Data
This Net-Zero Report has been submitted a couple times to CalRecycle. Please add this to the Zero Waste docket.
The Baseline Report for Zero Waste should have also included greenhouse gas reduction calculations as the definition of many zero waste includes resource conservation, circular economy, and sustainability.
Please respond to the first comment letter that GHG calculation should be modeled for 75% and zero waste, as it is not just a tonnage exercise.
From: Evan Edgar
Sent: Monday, February 10, 2025 4:26 PM
To: **zerowaste@calrecycle.ca.gov**
Cc: Vang, Sue@CalRecycle; Mindy.McIntyre; Heller, Zoe@CalRecycle
Subject: Zero Waste Workshop - Comments are due Feb 10, 2025 - Resubmit Comments from last Workshop
CalRecycle:
These Comments were filed for the last Workshop.
CalRecycle held a second Workshop without really reviewing the comments from the first Workshop.
CalRecycle should have a 'Public Comment' docket where comments can by posted up in a transparent way and be able to be viewed by other. CARB keeps an open file on Comments Received where all stakeholders can review all comments, which now it goes into a black hole without comment or reference.
Evan
From: Evan Edgar
Sent: Monday, February 10, 2025 4:09 PM
To: **zerowaste@calrecycle.ca.gov**
Cc: Vang, Sue@CalRecycle; Mindy.McIntyre; Heller, Zoe@CalRecycle
Subject: Zero Waste Workshop - Comments are due Feb 10, 2025 - The process is not transparent, stakeholders are not really engaged, and the comment process is not readily accessible
Mindy:
CalRecycle will not receive many comments today on Feb. 10, 2025, due to poor awareness and cumbersome process to comments.
Please add these to the zero waste comments docket. CalRecycle, like CARB, should have a public docket process to upload comments and view other comments of record that can be easily facilitated on your WebPage.
Lack of Awareness:

- The announcement for the Zero Waste Workshop only went out on the newly formed Zero Waste listserv and not on the many other listservs. CalRecycle used to post on many links to raise awareness and now it does not happen.
- CalRecycle did not promote the Workshop at it's Monthly Meeting
- CalRecycle did not promote the workshop until a few days before on your WebPage
- Finding access to provide comments is cumbersome as it's not on the Zero Waste WebPage having to dig deep just to find a way to provide comments. Not so transparent or accessible.
- CalRecycle will probably receive few comments – noy for lack of interest – but lack on content and transparent process.
- There was a listening session in Summer and Fall of 2024 listed on your WebPage. What was the content and results of those sessions as they were not advertised ? – but mentioned.
- CalRecycle should not wait until summer for the next Workshop but should put on some Content to discuss and readvertise again for March/April.

Lack of Content

- With lack of content, there is nothing to comment on.
- CalRecycle keeps asking the same questions without any responses back from the last workshop.
- There should have been a summary of comments provided

Lack of Engagement:

- Accenture of CalRecycle Staff has not reached out to key stakeholders on this.
- CalRecycle should be holding Workshops by topic and waste streams with stakeholders, which has not been happening.
- CalRecycle should be shopping the Zero Waste Plan to key stakeholder groups, and it is apparent that will not happen with just one Summer Workshop.

The process is not transparent, stakeholders are not really engaged, and the comment process is not readily accessible

Evan

Listening Session (Private Sector) – March 21, 2025

Comment 1:

Name: Yailynn Almanzamelendez
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
Existing city and county policies/requirements need to be standardized. Exclusive franchise agreements are barriers to stores like Target using specialty vendors who have unique abilities to handle cardboard, plastic, etc. Working with internal legal to try and overcome these issues is a challenge.
Recommendation O
We're frequently seeing situations where people put AirTags into recyclables, and they think materials are being handled improperly. This is a common misunderstanding / misperception. It might be good to improve education about the journey from bin/trash through Material Recovery Facilities. PSA example: "This is what happens when you put a battery in the trash". Could have a big impact on countering the "recycling doesn't work" narrative.

Comment 2:

Name: Ciara Aw
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
Sometimes buildings that we work with have waste managed by a landlord. Even if compost is mandated by CA, it can be really hard to get services approved by the landlord - if it's out of our control. There is also an issue with shared waste enclosures and contamination.

Comment 3:

Name: Curtis Conradie
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A/B
We are maxing out the incentives as they expand across the country and recycle tires into product bases. The incentives offered by CalRecycle are capped and can't support our anticipated level of growth. Can the caps be raised or removed on incentives? Currently we are looking at CA and Iowa for where to build our next plant.
Recommendation C
Mechanisms are currently good within the tire industry: when an end user purchases a tire, there is money already set aside to dispose of it. However it does limit the amount of the money going to a single source.
Recommendation E
We are fully permitted at this time and only concerned with future expansion. One thing holding us back is that the pool/program isn't large enough to sustain a program. There are expansion programs in other states that offer some help, but we haven't used them yet. Our program addresses "both sides": recycling a tire and turning it into crumb rubber; and secondarily, buying the crumb itself and turning it into a final product. The secondary incentive is too small – maxing out after 6.5 million pounds. The facility that we bought to convert crumb rubber into products is losing millions of dollars, but we keep at it because we are doing this work for the environment.
Recommendation I
There should be a CA-first mentality so that any companies recycling/producing products that are located in CA should be picked first when it comes to bidding products/companies for large projects, such as preparing for the upcoming Olympics in CA. Let's keep materials in CA.
Recommendation J
There should be a collaboration between CalRecycle and CA DOT. The rubber product that Traffic Devices produces is compressed into a base that is used on the side of roads for collision mitigation – if this product (or other recycled content products) could be prioritized/given preferential points during bids, this could be a big win in removing product from landfills.
Recommendation U/V
We don't really deal directly with the consumer much on outreach/engagement. Everyone is aware that there is a fee for purchasing a tire. If it is done right, a recycled product can compete with other non-recycled products in the marketplace, but we don't want to burden the customer with high taxes.
Other Comments
We went through a CalRecycle audit through the tire program a few years ago. It was a 100% audit which must have cost the Department a lot of time and money. We suggest doing a 20% audit to start with and then if issues are found, expand the audit to 100% rather than doing the 100% audit up front.
There should also be a clearing house for recycling technologies.

Comment 4:

Name: Ramesh Srinivasan
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation B
Does the framework include EPR? They are proving effective and should be included as an element of the framework.

Comment 5:

Name: Sheng Su
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:

Recommendation B
For Pathway 3, there is no waste, rather it is a resource for new product. Policy should redefine waste as a resource and establish highest and best use principles. For example animal feed is input for organic fertilizer via fermentation and machine. We need the materials management definition standardized across agencies.
Recommendation D
We need financial strategies for small businesses and technology funding. Small business loans and grants for manufacturing and investment. We need incentives for small businesses to invest and a shorter time period for access. Funding needs to be flexible. We also need community, school, and government involvement to support small businesses. Help small businesses find consumers to buy their products.
Recommendation E
Our company's focus is organic waste. Infrastructure was improved with our fermentation technology and we can produce fertilizers in 24 hours. There is a need to redesign for new infrastructure to connect with agriculture, to cluster all technology in one building so that the collection and technology happens in the same central place (underground is fermentation and compost, feedstock on ground level, size dependent on amount of food waste that needs processing).
Recommendation H
For manufacturers, we need to know all the materials that go into a product and can customize feedstock sources to produce the product. We need a facility to handle all food waste and feedstock control so they can produce organic fertilizer. We need a process to keep organic inputs separate from non-organic inputs. We use insects to help produce organic materials that meet the standards. We use technology and machines to set up different infrastructure.
Recommendation J/K
We are a small business supporting circular economy in partnership with CalRecycle and CA government to make organic fertilizer. We can use this process to manage the waste created in desert areas, taking waste to create food. The government can lead with infrastructure development for international collaboration. CA is a model for sustainability and reuse, we could help the Middle East. They produce waste every day, and we could help them use this waste to produce self-sustaining food. They can't produce food easily, and we (or Europe) can help with our technology for a regional waste solution.
Recommendation M
We need technology to cover all types of materials (organic/non-organic). We need to set up manufacturing and manage the waste stream so that we can clearly see the gaps in solutions and project/anticipate what is needed, including equipment and people/staff. Research can help innovate solutions.

Comment 6:

Name: Cherise Petker
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation D
I have a financial rec: FOAK (first of a kind) project funding for circular economy pilots of new innovation in demand. Such as for reusing End of Life wind blades.
Recommendation I
We can add more recycling at stadiums and universities because the glass collected from those venues can go into recycled content products like Circular Solar.
Recommendation J
We need to have review by CalRecycle, CA Energy Commission, and CARB to increase glass bottle recycling rates –glass beads are produced out of state but using California glass. We could stop them being produced out of state by placing glass beads under solar panels to create white albedo effect. We need to have conversations with all three agencies to determine if they can pilot something like this through funding and reduced permitting times. We have had conversations with CARB board members who were supportive but need to bring all three agencies (CalRecycle, CEC, CARB) together. End of life wind turbine blades are being shipped out of state because processing out of state is more economic and the regulatory environment in CA is a barrier that says cutting up turbines creates micro plastics. Shipping turbines on diesel trucks is carbon intensive when instead we could process these in CA.
Recommendation L

Can CalRecycle create an innovation space or location where businesses can showcase innovation that is taking place in California for an international audience? Either a CalRecycle space or a hub could also be a space for businesses to collaborate.
Recommendation O
I visited Republic in Las Vegas with largest recycling facility in country. I noticed different locations have higher rates of contamination on different days of the year, and recommend making signage in language other than English and Spanish such as Mandarin to help address the language barrier and reduce contamination. I recommend CalRecycle communicate in multiple languages, including for social media.
Recommendation T
CA-made means more expensive, but only because we don't attach the embodied footprint of a product and account for avoided emissions from not being transported from out of state or overseas. Wine in CA for example – if it was produced at the new hybrid electric Gallo furnace, that is 50% less carbon, perhaps highlighting that will overcome people's unwillingness to pay a premium for CA-made product.
I see a lot of people consume fast food and drop the bag in the parking lot even though garbage cans are available. How do we get through to those people? There's not enough trash and recycling containers in public spaces in Alameda. We should add all bins to Electric Vehicle charging stations as people have time to process materials in their car and place them in appropriate containers while charging; there is a synergy with that idea and the State Agency Buy Recycled Campaign.

Comment 7:

Name: Antonio Valenzuela
Date received: 3/21/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation F
I am newer to these meetings but I wanted to see if you connected people who might need crumb rubber with manufacturers or is that something we have to find ourselves?

Comment 8:

Name: Schweta Srikanth
Date received: 3/26/25
Source: Email (**ssrikanth@ecoreintl.com**)
Attachment(s): No
Comment:
Hello,
My name is Shweta Srikanth, Chief Circularity Officer of Ecore International which is the parent company of SpectraTurf, located in Corona, CA. On behalf of SpectraTurf and Ecore International, I'd like to submit the following feedback.
Recommendation A, Pathway 1
Policy & Regulation: Review and refine existing policies, programs, regulations and statutes to align incentives and requirements with materials' highest and best use 1. Review and update key materials management targets, definitions and rules across state agencies and policies to align on definitions that drive materials to be used for highest and best use at each decision point
Feedback:
The materials in CalGreen code do not include rubber. Rubber recycling at this point in CA is only limited to Tires. Tires once converted into flooring or playground surfacing are no longer classified as a material that needs to be re-cycled in a circular economy. The fact is that rubber is a versatile material and can be repurposed and used multiple times for multiple applications. SpectraTurf has demonstrated this over and over again with the re-use of playground material, thus preventing millions of lbs of rubber surfacing from entering the landfills in California. We ask that end of life rubber surfacing, including gym flooring, athletic surfacing of tracks (indoor, outdoor), playground material etc. be included in the list of materials that are mandated to be repurposed. As the host of the LA 2028 Olympics, this inclusion, which will be applicable for so many Olypic events/venues, will demonstrate California's commitment to Zero waste on an international level.
Recommendation C, Pathway 1,2,3

Financial Mechanisms: Establish sustainable public sector funding that supports California's circular transition
Feeback: Include private sector companies for eligibility for funding related to circular economy, especially those that are further the goals and agenda of Calrecycle's zero waste plan.
Include transportation subsidies as part of the incentive structure. The biggest cost challenge today in trying to be circular is logistical costs.
Recommendation F, Pathways 1,2
F. Modernize and improve utilization of existing infrastructure while mitigating harms
AND
Recommendation H, Pathway 1
Expand and develop equitable, distributed ecosystems for source-separated material 1. Support expansion of and improvements for source separated materials' infrastructure (e.g., commercial food recovery ecosystems, material collection facilities)
Feedback for both above: Help establish multi-purpose collection infrastructure, including single stream collection for rubber.
Thank you.
Shweta Srikanth
Chief Circularity Officer
p: 973.573.2443
e: **ssrikanth@ecoreintl.com**
w**:** ecoreintl.com
Comment 9:
Name: Sheng Su
Date received: 4/5/25
Source: Email (**susheng2009@gmail.com**)
Attachment(s): Yes
Comment:
Additional Comments for CalRecycle Pathways
As a continuation and expansion of our previous submission, we would like to propose the following additional insights to support the development of an effective, statewide Zero Waste and Circular Economy policy framework:

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1. Waste as a Valuable Resource in California
We propose a paradigm shift in how waste is defined and treated across California: **waste should be recognized as an available and renewable resource**. Our technology and engineering systems are designed to utilize all waste types—including food scraps, agricultural byproducts, urban organic waste, and industrial residues—as raw materials for producing high-value circular economy products. These include organic fertilizers, animal feed, renewable construction materials, and sustainable consumer goods. By reframing waste as a resource, we can unlock economic potential, drive innovation, and reduce environmental impact across sectors.

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2. Development of Clear, Detailed Policies for Waste Classification and Separation
To enable effective circular systems, California needs clear, standardized policies for **waste cataloging, classification, and separation**:

- We recommend establishing a **comprehensive waste categorization system**, integrated into state and municipal waste management practices, to identify the highest and best use for each waste stream.
- **Statewide enforcement of source separation policies** is essential. All Californians—including households, commercial entities, and public institutions—should follow uniform guidelines to sort waste properly at the point of disposal.
- This effort must be **supported by digital technologies**, including smart labeling, scannable waste categorization codes, and data platforms that track material flow before collection. These technologies will enable more precise, efficient sorting and enhance the quality of feedstocks for recycling and reuse.

Refined Policy Recommendations for CalRecycle's Circular Economy Pathways

Pathway 1: Prioritize Source Reduction through a Circular-First Lens in Policy Design and Materials Management

Effective source reduction must begin with a deep understanding of the **who, when, where, and how** of waste generation. To design impactful circular economy policies, CalRecycle should adopt a **data-driven approach** that maps waste generation by source type, volume, time, location, and human behavior. Policy design should follow the principle of **focused prioritization**—addressing high-impact, urgent issues first, progressing from simple to complex solutions. This phased strategy ensures efficient allocation of resources and maximizes early successes, building momentum for broader systemic transformation.

Pathway 2: Develop a Statewide Strategy for High-Volume and High-Value Waste Streams

CalRecycle should implement a comprehensive strategy to manage **materials of concern and high-value waste streams** through **region-specific technical solutions**. These strategies must consider:

- **Material scale and type**
- **Local infrastructure capacity**
- **Opportunities for resource recovery and reallocation**

By applying differentiated technologies tailored to each region—such as advanced fermentation systems, bioconversion, or modular recycling units—California can **transform and industrialize waste materials** into valuable circular economy products. The goal is to create a network of **localized yet interconnected solutions** that reflect regional waste profiles while contributing to statewide zero waste goals.

Pathway 3: Integrate Circular Principles into Policies Influencing Material Consumption and Generation

Circular considerations must be embedded into policies that affect upstream material consumption and downstream waste generation. A **multi-tiered classification system** should be adopted to direct waste streams into optimal reuse pathways, including:

- **Direct reuse as industrial input**
- **Indirect reuse through preprocessing (e.g., composting or bioconversion)**
- **Customized solutions for commercial clients and environmental restoration**

This approach allows for **flexible transformation pathways**, enabling California to move toward a **networked, self-sustaining waste conversion system**. Building a **socially integrated and technologically advanced transformation infrastructure** across the state will enhance resilience, inclusivity, and the capacity to achieve true zero waste.

I. Legislative Goals and Background Analysis

In the context of California's push toward a Zero Waste and Circular Economy strategy, CalRecycle—as the state's primary agency for waste management and resource recovery—should have its responsibilities expanded and clarified. It should be formally recognized as the core public authority representing the state in the development, management, and utilization of waste-based resources and infrastructure.

Legislative Objectives:

1. **Grant CalRecycle the authority** to oversee the allocation and regulation of waste-derived resources and infrastructure development.
2. **Define ownership, usage, and revenue rights** of public waste resources to ensure they serve the public good.
3. **Establish a fair resource redistribution mechanism** that benefits underserved and low-income communities.
4. **Institutionalize equity, poverty reduction, and service to the public** as legal mandates within CalRecycle's responsibilities.
5. **Implement oversight mechanisms** to ensure accountability, transparency, and public trust in CalRecycle's actions.

II. Legal Basis for Legislation

1. Constitutional and Administrative Authority

- The **California Constitution** empowers the state legislature to establish agencies to carry out environmental protection and public resource management functions.
- **CalRecycle** already operates under legal frameworks such as the **California Integrated Waste Management Act**.

- New legislation can clarify and expand CalRecycle's role in managing waste-to-resource infrastructure and ownership.

2. Public Interest and Social Responsibility

- Under the **Public Trust Doctrine**, the state holds natural and renewable resources (e.g., land, air, water) in trust for the public.
- CalRecycle's stewardship over compostables, organic waste, and recyclables should be codified to reflect this doctrine—ensuring that all benefits are returned to society.

3. Legitimizing Resource Ownership

- Legislation can designate post-consumer waste, organic materials, and recyclables processed under state-authorized systems as **public resources**.
- The state, via CalRecycle, would hold the rights to manage, develop, and distribute the benefits derived from these resources, integrating them into **public budgets or a dedicated circular economy fund**.

California Circular Economy and Public Resource Reallocation Act (Draft)
Chapter 1: General Provisions
Article 1: Legislative Purpose
This Act aims to establish a circular economy framework that defines the ownership and management of regenerative resources, strengthens the public authority of the California state government—particularly CalRecycle—in resource recovery, infrastructure development, and equitable redistribution, and promotes environmental justice, poverty reduction, and sustainable development across society.
Chapter 2: Resource Ownership and Governance
Article 2: Public Ownership of Regenerative Resources
All regenerative resources collected, processed, or recovered through systems operated or authorized by the State or its agencies are considered public assets. These include, but are not limited to:
Organic waste (food scraps, human and animal waste)
Recyclable materials (plastics, metals, glass, paper, etc.)
Remanufactured goods (e.g., bio-based plastics, reclaimed construction materials)
Article 3: Resource Management Authority of CalRecycle
CalRecycle shall act as the principal administrative agency representing the State and shall be empowered to:
Manage the ownership, usage rights, and revenue streams of public regenerative resources;
License, regulate, and monitor the development, use, and distribution of said resources;
Establish or authorize a Circular Economy Investment Fund for reinvestment into public-interest projects.
Chapter 3: Redistribution Mechanisms
Article 4: Redistribution of Resource-Derived Revenues
Revenue generated from regenerative resources shall be redistributed by CalRecycle in the following order of priority:
Infrastructure development in low-income, disadvantaged, and pollution-burdened communities;
Investment in local circular economy initiatives (agriculture, education, vocational training);
Innovation in green technologies and zero waste demonstration zones.
Article 5: California Circular Equity Fund
A dedicated fund, the California Circular Equity Fund, shall be established to support resource redistribution. Sources of funding include:
Revenue from the sale or use of regenerative resources;
Fines collected for improper waste disposal or resource mismanagement;
Allocations from green tax incentive programs and state subsidies.
Chapter 4: Oversight and Public Participation
Article 6: Transparency and Accountability
CalRecycle shall submit an annual report to the State Legislature, independent auditing bodies, and the public, detailing:
Resource collection and usage data;
Ownership and revenue tracking records;
Fairness metrics and community-level impact assessments.
Article 7: Participatory Governance
The following projects and decisions shall be subject to public hearings and community consultation:
Construction of new resource recovery facilities;

Public-private partnerships involving resource development;
Allocation of significant Circular Fund disbursements.
Chapter 5: Legal Liabilities and Incentives
Article 8: Legal Accountability
Unauthorized possession, disposal, or resale of public regenerative resources shall be considered unlawful misappropriation of public assets and subject to legal action.
Article 9: Incentives for Circular Innovation
Social enterprises, cooperatives, and research institutions that meet the objectives of this Act may be eligible for:
Tax incentives and fee waivers;
Innovation grants and subsidies;
Priority access to public infrastructure and testing platforms.
Visionary Justification
This Act envisions a modern resource revolution, positioning California and the U.S. at the forefront of sustainable prosperity through institutionalized circular economy strategies. By treating waste as wealth, enabling public ownership, and redistributing benefits equitably, this model mirrors the transformative impact of the industrial revolution and empowers regenerative industries, equitable employment, and a new ecological public commons.

III. Key Proposed Legislative Provisions (Draft Outline)

1. Authority Confirmation Clause

- Recognize CalRecycle as the lead public body on behalf of the state in matters of waste resource utilization, land use, infrastructure development, and allocation of recovered materials.

2. Resource Ownership and Redistribution Clause

- Classify all materials processed under state programs as public resources.
- Require that proceeds and products derived from waste utilization be directed toward public programs—particularly for reinvestment in infrastructure and support for low-income communities.

3. Infrastructure and Property Rights Clause

- Waste-to-resource facilities (e.g., composting, fermentation, remanufacturing) should be state-owned or operated under public-private concession agreements.
- Establish clear legal agreements on ownership, operational control, and revenue sharing.

4. Equity and Oversight Clause

- Mandate that all policies implemented by CalRecycle include environmental justice and prioritize marginalized communities.
- Create an independent oversight body to monitor transparency, equity, and efficiency in project implementation and resource allocation.

IV. Legislative Implementation Strategies

1. Sponsor a Bill (Assembly/Senate Bill)

- Identify and collaborate with legislators focused on environmental justice, labor rights, and equity to champion the proposal.
- Partner with cities and community organizations to build a broad coalition of support.

2. Conduct Hearings and Community Engagement

- Work with NGOs, academia, and stakeholders to submit reports on cost-benefit analysis, equity impact, and public health to support the necessity of the legislation.

3. Establish Cross-Agency Coordination

- Align with other state departments such as the **California Energy Commission** and **Department of Housing and Community Development** to reduce bureaucratic hurdles and unify sustainability objectives.

4. Mobilize Public Support

- Use public outreach, media campaigns, and community engagement to promote the idea that **"waste is a resource"** and that the government must **manage public wealth for public benefit**.

Financial Mechanisms to Accelerate California's Circular Transition
Recommendation C: Establish Sustainable Public Sector Funding to Support the Circular Economy
To ensure long-term success and scalability of California's transition to a circular economy, the state must implement resilient financial mechanisms that align with zero waste principles and circular outcomes.

Pathway 1: Redesign Public Sector Funding Models for Circular Outcomes
Current materials management funding mechanisms should be restructured to prioritize circular practices—such as waste reduction, reuse, resource recovery, and closed-loop manufacturing. Funding criteria must be updated to support projects that align with highest and best use of materials.
Example Action Step:
Conduct a comprehensive review of existing funding mechanisms and identify gaps where they do not align with circular economy objectives.
Pathway 2: Expand Flexibility in the Use of Public Funds
Enable more adaptive and outcome-focused use of public funds by removing rigid restrictions that limit circular innovation. Grant recipients should be empowered to apply funds where they are most impactful—whether in infrastructure development, technology upgrades, pilot programs, or workforce training.
Example Action Step:
Revise grant guidelines and funding models to allow for broader, cross-functional use in circular economy implementation.
Pathway 3: Integrate Circular Funding Mechanisms Across State Agencies
Break down silos by embedding circular economy principles into the funding programs of other state agencies—such as transportation, housing, water, and agriculture. A coordinated approach will maximize impact and resource efficiency, ensuring that circular thinking permeates all levels of policy and funding.
Example Action Step:
Identify opportunities for cross-agency collaboration and co-funding of projects that deliver both circular and sector-specific benefits.
Strategic Insight
The growth of a circular economy will revitalize industrial supply chains, drive resource reallocation, and contribute to equitable wealth redistribution across communities. The financial backbone of this transformation should be built upon:
Existing waste collection fees and tax revenues
Incentives for private investment in circular technologies
Public-private partnerships (PPPs)
Federal and international funding alignment
Together, these mechanisms will create a resilient and inclusive funding landscape that supports California's leadership in sustainable innovation.
F: Modernize and improve utilization of existing infrastructure while mitigating harms
Recommendation F: Modernize and Optimize Existing Infrastructure
Upgrade California's existing waste management infrastructure to meet the **technical standards and circular performance metrics** needed for the future. Focus on increasing **waste conversion efficiency**, reducing **land and energy use**, and enhancing **environmental safety**.

Key Objectives:

- Improve waste-to-resource conversion rates and processing speed.
- Maximize land, energy, and water use efficiency.
- Integrate advanced automation, AI, and microbial/fermentation-based technologies.
- Transition underperforming or obsolete facilities toward closure or repurposing.

Example Action Step:
Audit existing facilities for circular economy readiness and prioritize funding for those with the highest upgrade potential or strategic location.
Recommendation G: **Spur the Development and Expansion of Proven, Equitable, and Accessible Circular Business Models for Finished Products**
Recommendation H: **Expand and Develop Equitable, Distributed Ecosystems for Source-Separated Materials**
Governance of Infrastructure and Resource Rights
To successfully build and scale circular economy infrastructure, it is critical to define clear legal frameworks around the **ownership, use, and distribution rights of infrastructure and recovered resources**. These frameworks must be established through robust laws and policies that uphold **transparency, accountability, and equitable public benefit**.
As the lead agency, **CalRecycle holds the responsibility to steward these rights on behalf of all Californians**, ensuring that public infrastructure and natural resources are developed and managed for the

collective good. This governance model should **promote equitable access to circular economy opportunities**, prioritize historically underserved communities, and help **close economic gaps while advancing environmental justice**.
By embedding **fair resource distribution and shared infrastructure ownership** into the circular economy strategy, CalRecycle strengthens its commitment to a just transition—driving both **economic resilience** and the **elimination of poverty** through inclusive development.
Partnerships:
The most effective and irreplaceable partner is **CalRecycle**, which holds the authority, credibility, and direct access to California's resource allocation systems. As the state's lead agency, CalRecycle is uniquely positioned to coordinate efforts across sectors and regions, accelerating the achievement of zero waste goals and leading the development of a world-class circular economy. Its role is not only foundational within California but also influential globally in shaping circular innovation.
Partnerships should adopt **project-based collaboration mechanisms**, including both competitive bidding (RFPs) and cooperative partnerships for independently initiated projects. This dual model allows for flexibility, transparency, and innovation in aligning public-private efforts with California's long-term circular economy objectives.

Research & Innovation
To accelerate the development of a circular economy, California must foster a culture of innovation, reform, and environmental stewardship across all sectors of society. This includes empowering universities, research institutions, and industry professionals to pioneer new technologies, systems, and business models. At the same time, we must cultivate an inclusive ecosystem that supports entrepreneurship at all levels—enabling individuals and communities to participate in building a circular industrial supply chain.
California should lead in establishing a comprehensive circular economy that connects local production with North American and global markets. This requires:

- **Promoting cross-sector innovation** in materials science, manufacturing, product design, waste conversion, and resource recovery.
- **Supporting startups and small businesses** focused on circular economy solutions, especially in underserved communities.
- **Creating strong academic-industry partnerships** to turn research into scalable applications.
- **Standardizing research priorities and frameworks**, with transparent publication of all relevant research fields, including:
    - Circular supply chain systems
    - Industrial manufacturing and remanufacturing
    - Spare parts reuse and standardization
    - Material recovery technologies
    - Lifecycle product design
    - Waste-to-resource conversion technologies

This strategic investment in innovation will position California as a global leader in circular economy development, setting the standard for industrial transformation and sustainable economic growth.
Communication & Awareness
Effective communication and public awareness are essential to ensure that all Californians understand and benefit from the transition to a circular economy. The goal is to design messaging that resonates with people's everyday lives—highlighting how circular practices create healthier communities, economic opportunities, and environmental resilience.
The most successful communication strategies are those that deliver clear benefits to the public, making it easy for **everyone to participate and enjoy the rewards** of sustainable living.
Key principles include:

- **People-first messaging** that emphasizes community well-being, equity, and shared prosperity
- **Inclusive education campaigns** tailored to diverse languages, cultures, and regional needs
- **Accessible information** about programs, services, and opportunities in zero waste initiatives
- **Community-based outreach** through schools, faith groups, local businesses, and media
- **Celebration of success stories** that inspire public pride and participation

By making circular economy awareness engaging, inclusive, and practical, California can empower every resident to be part of the solution.

Data & Monitoring
Robust data and monitoring systems are essential to the success of a circular economy. To ensure accountability, transparency, and continuous improvement, California must establish comprehensive mechanisms to track **when**, **who**, **how much**, **where**, and **what** waste is generated, collected, processed, and reused.
Key priorities include:

- **Real-time tracking systems** that capture key data points across the entire materials lifecycle
- **Digital identification and recognition technologies** (e.g., QR codes, RFID, AI-enabled sorting) to accurately classify materials
- **Standardized coding systems** to label and trace materials, sources, and processing outcomes
- **Geospatial mapping** to understand regional material flows and infrastructure gaps
- **Publicly accessible dashboards** for transparent reporting and community engagement

By deploying intelligent monitoring tools and digital infrastructure, California can optimize circular resource flows, improve policy design, and empower stakeholders with actionable insights.
Sheng Su
Sustain You
susheng2009@gmail.com
510-925-6281

Comment 10:

Name: Cherise Petker
Date received: 4/7/25
Source: Email (**cpetker@gmail.com**)
Attachment(s): Yes
Comment:
Dear CalRecycle 2026 Zero Waste Advisory,
The following submission is for responses to the 22 recommendations. I am following up from the March 2025 listening session. FYI, our family owned, operated a small but one of the most sustainable corrugated, paper, packaging plants in Canada, supplying the glass industry, in the Toronto area in the 70s-90s. We move the needle in circularity for customers such as Labatt's Beer, Coors, Bacardi Family, Smuckers Jam. We used the highest rates of recycled paper, paid into funds for planting trees for reforesting, I personally showed my Dad how to re-engineer our presses to collect our industrial corrugates waste, brought it back to the paper-pulper box supplier (between ages 8 – 11 years old). My late Father redesigned some of his customers boxes to ensure no tears in the handles to ensure bottles could be returned in the boxes we made, back for DRS at CRV sites like, The Beer Store. Offering recycled, sustainable natural resource packaging was extremely expensive, and with high interest rates and costs of energy (much like today) we survived on slim margins. Plastic packaging was our competition; we warned customers of the future plastic planet we would have today, if they switched to plastic. In 1992 we had to shut down, facing bankruptcy. Sharing this, so you understand background on the following recs and innovative products. And why it is so important that the plastics industry provides both improved design for recycling and the funding necessary to clean up our plastic pollution planet.
The CalRecycle recommendations are on the left half of the document, with responses and potential scalable market application solutions on the right half of the document.
By Cherise Petker,
Founder, Circular Solar LLC
Info@CircularSolar.net, cpetker@gmail.com
Policy & Regulation Recommendation
Project Circular Solar focuses on research, innovation and products for current recycled, new potential products, supporting and scalable globally for the
UN Zero Waste Initiative, Renewable Energy, CDR (carbon dioxide removal) targets:
Materials:
Recycled glass, to support **SB1013** Bottle Bill and for SB54 this project ensures higher rates of overall glass recycling eliminating "single use" in glass packaging.
Wind turbines composite fiberglass blades, nacelles which can fall under this bill that just passed, **SB235** ("other similar valuable materials within products"). This bill includes requesting CalRecycle to take under consideration the opportunity CA has with EoL materials from energy which contain critical minerals, metals, such as REE (rare earth elements), and other materials, that are exported out of state for their

recycling, businesses. Circular Solar takes it next level, with the ability to reuse, repurpose whole EoL wind blades, nacelles into negative emissions solar-battery power plants. Pitch deck with live tests **available here**

Concrete, certain construction waste: SB596 which is for low carbon cement, this may include circular concrete materials.

Certain **single-use plastic packaging: Sb54**

Nanotechnology for environmental remediation, carbon removal: which supports and should qualify for **SB285**

Circular Solar's first concrete, glass example in a road installed in Fairfield in 2008 which was an early real-life example supporting: SB1013, SB596, SB285: https://youtu.be/l7ydpFWBpGo

To increase consumer participation of recycling, innovation is required where consumers feel moved to make additional effort. By seeing recycled glass materials cooling surfaces reflecting sunlight, heat back up into the atmosphere or into solar panels, simulating high albedo value fresh snow, this both cools the ground and surface (such as rooftops which means energy efficiency in the home; less A/C use) and produces higher solar efficiency. By adding these cooling, recycled products around roads, highways, ports or waterways (solar canals for example) along with carbon management nanotechnology, to break down exhaust emissions to toxic tire dust (6PPD-Q fatal to Coho Salmon, Trout), knowing it offers various climate, environmental, energy benefits; consumers will try harder to recycle.

Additionally, Circular Solar is patent-pending for this technology added to Wind turbines in use, as carbon removal wind energy and negative carbon solar farms.

Financial Mechanisms Recommendations

C 3 and D3. could expedite funding opportunities. For example, CalRecycle, CEC, CARB would all review this project and by pooling time, funding between these agencies, lower cost innovation should scale. Perhaps expediting policy to permits?

Infrastructure for Circularity Recommendations

F.: If there are more options for moving heavy recycled materials by rail or future autonomous self driving EVs, this could support infrastructure retrofitting. DRS, CRV return locations, such as at Savers and Bottle Bank appear to have been successful but need expansion. Small e-mobility in urban areas can help run smaller loads to smaller bottle, container return locations.

Funding for reverse vending machines may be an option, but these are very, very high capex. I have been most impressed by JADO Recycling. In the Circular Solar bottle return at EV charging stations, urban areas may support high capex reverse vending machines, and rural JADO recycling type businesses, ideally near a rail spur. With major bottle producers in the Central Valley, such as Gallo Glass, O-I, Ardagh, rail is the lowest cost transportation for recycled cullet back to furnaces.

G-H.

EV charging stations, parking lots desperately need more bins for recycling.

Urban recycling transportation could include autonomous taxis for cargo transportation during days with high rates of recycling. Such as on weekends in bar, restaurant areas. Waymo, Tesla autonomous taxis could work with Uber Eats as well, to somehow utilize consumer and business bottle returns.

They could do autonomous trips late at night or early morning for bottle, jar pickup and delivery to return locations like JADO recycling. Or in areas near glass producers, such as Modesto, Tracy, Fresno – directly return bottles to Gallo, O-I, Ardagh. This would give a pathway to bottle refill, and until then 100% clean cullet (as the glass producer can ensure no contamination).

This can launch utilizing the **Circular Solar EV charging efficiency product**, made with recycled glass from California, applied as a coating onto existing hot asphalt or concrete, below where autonomous wired or wireless EVs charge. It also offers CDR, carbon removal, breaking down airborne ICE vehicle exhaust buildup, brake dust (PFAS) tire dust (6PPD-Q associated as toxic to salmon, trout a source of revenue for Tribal nations). In that link, the charger on the ground represents wireless induction charging pads; which my product ensures it is cooler; faster charging.

Partnerships Recommendations

I. - K. 2:

Stadiums, Unis area ideal for bins to separate recyclables by materials; such as one bin for aluminum cans, other for glass, compost, landfill.

Homeless to housed can play a vital role in environmental clean-ups for DRS, CRV materials and their delivery. Once housed, easily trained for this new job, as waste, recycling management workers in urban

areas, e-mobility can be deployed. Such as economic e-bikes with cargo trailers to move materials from bars, restaurants to return locations. Using sidewalks and bike lanes makes this process faster.
And this is a solution for new workers with felony records, that may include DUI's creating issues with attaining or affording a drivers license, car, insurance to perform this work. Payments can be made using scan me codes and apps. Also ensuring now cash is required to prevent any theft, improving safety.
Kids in school can also participate on a smaller level using e-scooters, bicycles. These can be organized as school field trips to do ongoing beach, park cleanups after major holidays when litter rates are very high, **such as July 4th weekend.**
These are also examples where inter-agency development on these projects can help facilitate a circular economy and provide new jobs for unhoused to housed and transportation can be provided by major California automakers, Tesla Robotaxi, Waymo, and Rivian just launched Also, Inc. to produce e-bikes, e-scooters. Oh and here again, the Circular Solar recycled glass, EV charging product is well suited as infrastructure for charging this transportation and improving road markings (the CDR nanotech stays cleaner, more reflective road markings, per my due diligence).

Research & Innovation Recommendations

During the listening session, I made the recommendation of creating a circular, recycling STEM hub in Sacramento (or LA) to demonstrate micro versions of projects which can scale. LA location would double for LA28.

Communication and Awareness Recommendations

O. When me and my Engineer went to visit, tour Republic Services largest recycling plants in N. America in Las Vegas and then also SMI (nor Sibelco) and casinos to learn more about single stream recycling flow within Vegas (it is amazing, they really have it dialed in) one issue is lack of signage in various languages. For example, They have had more food waste or contamination of materials on days they pick up in the Chinese areas, or Latin areas where there may be misunderstandings because they are no signs or PSA advertisements in Mandarin and Spanish.
With phones and scan me codes this can be remedied. My recommendation is to promote scan-me codes on signs and online advertisements that ensure translation into the parties language. More signs in both English, Spanish, mandarin and more may also reduce contamination; thus landfilling.

Listening Session (Social Sector) – March 26, 2025

Comment 1:

Name: Nick Lapis
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
Looking at the first action step example provided: will this action step be completed before the report comes out? If not, we are disappointed that these action steps won't be completed before the plan comes out.
It would be helpful if the report was framed as these are steps that CalRecycle will take. There is a real lack of mention of CA policies (AB 939, SB 1383, AB 341). The zero waste plan not integrated with existing laws. At a bare minimum, edible food recovery is not mentioned.
Recommendation B
The plan should be a commitment for the Agency (e.g., problems and solutions that CalRecycle can work on with existing authority, or solutions that the legislature can adopt). CalRecycle has very broad authority under SB 1383, and broad authority under the regulatory trigger in SB 54. There are things CalRecycle doesn't have authority over, some things are going to require budget funding. Laying out the plan – what CalRecycle will do, what the Legislature will do, etc., would be much more actionable.
Recommendation C/D
We don't want to subsidize with taxpayer money--what about EPR? While there are some cases where we don't have a great producer responsibility model, like food scraps or organics, with most products, we don't want to be subsidizing them with taxpayer money. EPR is a form of producer responsibility, but there are other ways for manufacturers to create a financial incentive for closing the loop on products. Recycled mandates are also helpful.
Recommendation E

We're nervous about the broad infrastructure terms used which could be interpreted to mean other forms of infrastructure such as Waste to Energy if not defined. Zero waste infrastructure would be more clear.
For a true zero waste infrastructure, we support getting rid of barriers – making it easier to build. But some of the recycling facilities are actually really impactful. Something like smelting facilities, paper mills – these are some of most impactful facilities that exist. We have not supported streamlining permits for any of those types of facilities, and communities should have input, even if we want them to succeed in the long run.
Finally, here and in some other places there's a variety of Tribal and communities mentioned, but there is no talk of environmental justice –I think when you say community you are including this but would help to be explicit.
Recommendation F
The word "innovative solutions" is concerning. Often, people propose solutions in areas where innovation is not necessarily needed, either by creating new materials or new processes. For example, creating new materials that we don't actually know how to handle yet. Basically, things like "innovative technologies for processing waste" can be a euphemism for creating new problems instead of real solutions.
Recommendation G
On Pathway 2, it would be good to be explicit that this is a requirement on the manufacturers (not funded by the State). For example, manufacturers should have reusable, refillable beverage containers.
Recommendation H
The term "recovery" can mean different things, unless it's clearly defined. Recommend not using that term.
Recommendation I
On Pathway 2, be clear about what they will be doing and if there is an existing mandate, specify if there is anything beyond the mandate. It would be good to not be generic.
Recommendation J
Emphasize the need to pay special attention to organics. Cross-regulatory issues are really significant. Actually, a bill a few years ago told CalEPA to convene all those folks to issue a report on how to do this. You may want to dust off that report and see how far beyond that you can go.
Recommendation M
Be clear you are talking about zero waste solutions.
Recommendation O
Too generic, this is great but should focus on specific sectors (e.g. focus on material types like organics, HHW), where the public sector is doing a lot of outreach. With SB 1383, you basically have 500 jurisdictions each coming up with their own messaging. Even the most well-meaning jurisdictions can only afford to do so much focus groups and outreach; this could be much better handled at a state level. Outside of HHW, the biggest public education need is around organics – getting people to divert their organics.
Recommendation Q
This is really useful. Maybe CalRecycle could look at making their data more accessible (RDRS, Bottle bill)– would be very useful to help accomplish this recommendation. Cal Enviroscreen is a useful tool.
Recommendation U
Capacity building is mentioned. And looking at pathway two about meeting people where they are, I think supporting capacity building for organizations like Valley Improvement Project would be a very effective use of funding. They already speak the language that the community speaks. Somebody was talking about outreach they were doing, saying that zero waste is a term that's meaningless to most people. If anything, they think of the social media influencers that generate a jar worth of garbage a year. And that seems totally disconnected from their real life situations. And we have a lot of groups in California like Valley Improvement Project, like CEJA and the EJ CAP members that really have deep roots in the communities. I would just suggest focusing on capacity building for those organizations directly.

Comment 2:

Name: Heidi Sanborn
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
The state started with recycling goals back in 1989. We didn't do anything with source reduction until SB 54 on packaging. And it just seems like we are getting paralysis of analysis. I would like to see some real

results coming out of this report. We need to move; we are not moving fast enough – we're not turning off the spigot on waste. And that was what AB 939 said - 1989 now and we are still at 40 million tons.
Your action steps could be: Look at your existing reports. We (Statewide Recycling Commission) gave 34 policy recommendations to the state; I think 14 have become law. But most haven't. The report told the state what needs to be done. Half of this is political will, in my opinion. We need to tell politicians what needs to happen and it's up to them to decide if they are going to do it.
We are not doing this in the right order. One of the action steps could be there is an order that these things should happen in. And we're just throwing mud at the wall. Whichever advocate puts in a bill that's lucky enough to get to the Governor is going first and it turns out we're doing this in the wrong order. For example, I tried to get household hazardous waste done w/ Chesbro in 2010 and nobody was ready. Then we ended up doing organics before packaging so now we have plastics in the organics, and we never got to HHW. So now HHW is contaminating plastics and organics – so that could be an action – get things in the right order from here on out so that we make the system more cost-effective when we get to it.
And the E-waste report that came out in 2014 that had a bunch of recommendations – nothing ever happened. Now it's the fastest growing waste and we need those critical earth minerals.
Recommendation B
There is an issue with the term "circular materials." It would be more meaningful and make more sense to say for these materials, these are the right general policy approaches and under this approach for this material category, we recommend it be addressed in a specific order – in order for state to have the best outcome, this is the most cost-effective.
We should also have a draft strategy for each priority emerging material stream. We all know what these priority emerging material streams are: solar, batteries, battery walls, things with critical earth minerals, a lot of hazardous stuff coming on the market, e-waste expansion, textiles we are already dealing with.
Recommendation C/D
The priority is not sustainable public funding, it's private sector funding and producer responsibility. Unless its organics or something that doesn't have a producer, why is this a conversation? Producer responsibility was made a priority long ago and we need funding for the system, and it can't come from socialized costs. That isn't fair and it isn't equitable.

Comment 3:

Name: Ruth Abbe
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
The framework for our CA policies is based on the CA IWMB of 1989. It was innovative at the time, but it requires revisiting. We can't be bringing materials into the economy that will ultimately become waste – CA has an opportunity to change this. What has happened since has been a piecemeal approach – because we had a framework of putting requirements on local jurisdictions. As a result, we have built more and more requirements on these local jurisdictions. SB 54 is a good example of putting requirements on other entities, not just jurisdictions. We need a new zero waste framework that is zero waste focused, looking at ecosystems through a zero waste lens in our policy framework (e.g. legislation that removes the old framework and adds a lens into policymaking). Whoever takes this on needs to be someone working in materials management - should probably be CalRecycle.
Recommendation B
We support Pathway #2. The City of Berkeley recently looked at all materials flowing through the City and the major takeaway was that out of material still going into the trash, about half was readily recyclable or compostable through current programs (thanks to State and local programs). There are good opportunities for existing programs that can be continued and improved. For the remainder of waste, we don't have adequate solutions at the local level – these are "problem materials" like treated wood, diapers, composite materials, legacy materials, etc. – these materials currently must go to landfill. We can't allow more of these legacy materials into the state. Some of this leftover waste we have solutions for, but these solutions are not readily available (example: textiles). The Berkeley study is probably reflective of Statewide trends. We need Statewide action to address materials that cannot currently be handled at the local level. Don't let materials be sold in the State if we don't know what to do with them at the end of their useful life.
Recommendation D

Pathway 2. For this pathway, we want zero waste, not something circular. Circular plays a part in the middle – we want to recycle materials and get them reused.
Ratepayers have a role, there are price signals based on Prop 218. Example of a gap/disconnect—it might cost almost the same to pull out twice as much trash because of the cost-of-service aspect. We need to revisit rate signals; we give discounts on prices for throwing away more stuff. It's a privilege we pay more, but are there ways to reduce the amount of services and costs? To reduce the number of times someone is coming to my house and thus reducing how much I have to pay? Can the agency provide guidance and advice to local jurisdictions on ratemaking, on franchising to elevate rate structures that are compliant with state law, while also providing the right signal and incentives? Is there research that could be done to support that aspect? I really like that pathway and don't want to minimize ratepayer issue. It's important that we don't overburden them, but we really should be paying our fair share as well - we need solutions that send the right signals.
Recommendation F
We participate in the Global Recycling Council (CRRA) and one of our interests in expanding infrastructure is establishing resource recovery parks for self-haul because we already have great policies around jurisdictions doing local composting and recycling. We have self-hauling in all communities and a bunch of readily recyclable materials is hauled in – but it is brought in un-segregated. Mandatory source separation and mandatory diversion for self-haul is a really important aspect. We have a concept for a resource recovery park with 12 categories for materials from self-haul or from commercial and residential sector. Berkeley recently completed a characterization study and 70% of materials that came to transfer station from self-haul sector was readily recyclable/composted through the city's programs. As municipal programs do better and better for residential and commercial, self-haul becomes a larger program to address through infrastructure and that's one infrastructure solution that should be addressed as a pathway. It is not being addressed now and is a huge service void in the state.
Recommendation H
Let's expand ecosystems but with better solutions. We're concerned about the trend of jurisdictions and service providers investing in "dirty MRFs", dirty compost, dirty AD – probably in our haste to do as much diversion as possible. We thought this was a solution, but it may not be the best solution. State + CalRecycle should look at these "dirty" facilities and clarify: "are they meeting the requirements of State law as HDOWPFs?". Are there any incentives that the State could offer to encourage reduced reliance on dirty MRFs/compost and move towards retrofitting facilities for source separation?
Recommendation I
State agencies have an extra responsibility to model zero waste programs and practices. There are a lot of State agencies that are not up to date on their annual reports. Are there zero waste implementers in each of these State agencies to ensure they are complying with State law? It would be helpful to ensure that they are modeling proper programs in line with the law.
Recommendation J
Other states provide technical assistance to local jurisdictions. So much of what CalRecycle is obligated to do right now is for enforcement and compliance with local agencies for SB 1383 and there may be a lot of tension. Of course, it's needed and important. But we wanted to point out other states:

1) The Municipal Assistance Coordinators in Massachusetts – they have no enforcement role. Their job is working closely with communities to provide direct technical assistance (e.g., provide model franchise agreements, review rate studies), provide resources from the state to local jurisdictions. This could be one action step in the pathway.
2) The other is in CO - first called Front Range Waste Diversion Program. They provide grants to communities to develop zero waste plans in their communities. It is very important to have statewide zero waste plan; it's also important to provide tools, resources, and technical assistance to local agencies so they can also pursue zero waste. We are relying on them to do what is required, but we can also incentivize them and provide them with tools and resources to implement them.

Look at those two examples in CO and MA to see if we can come up with supporting those kinds of strategies, in addition to CalRecycle's great work in compliance.
Recommendation K
Reducing subsidies for overproduction and extraction. It is important for the State to advocate for federal level incentives.
Recommendation N

I support this recommendation and pathway, and suggest it explicitly include state universities and campuses. So many things won't be commercially viable at the beginning so these hubs for research and innovation would be helpful to inform public policy and technological solutions. UCLA, UC Merced, San Jose State also has a center for recycling.

Recommendation O

I appreciate these recommendations and pathways. There is a term in social psychology called community based social marketing (CBSM), this recommendation gets to that concept and is really appropriate at the statewide level. It goes to a targeted population (e.g. certain types of materials, or certain types of generators such as manufacturers who are working to create a product for a customer, certain types of actions). Who is not properly sorting or creating products that can't be recycled? Get to those people and identify the barriers and solutions. Engage with targeted generators and whoever is trying to influence to change: we need the behavior change of manufacturers. We have a lot of rules, so go to them and ask what is the problem? And it may be about selling more stuff, where a solution is not as viable. But really ask them to try to understand for their consumers in CA, what is the barrier to making their product compliant? And try to accommodate and support them, give them technical assistance needed, so they can be a part of zero waste solution. Let's use tools of community based social marketing.

The most famous CBSM example is "Don't Mess with Texas." The State Dept of Transportation identified a targeted population to address – young macho men littering highway. The "Don't Mess with TX" demonstrated compliance and achievement through that social marketing campaign.

Recommendation R

We need transparency and accuracy for sources of materials from jurisdictions, and to better understand where tons are coming from. There's a lot of good information on RDRS, but we still need more work to understand where these materials are coming from. For example, The City of San Jose gets so many phantom tons assigned because they are a host jurisdiction. There's an RDRS mechanism where you're not assigning host tons, they just go to the ether. There's a lot of special waste or class 2 waste that kind of disappears from jurisdictions' knowledge because they don't have any control over it. There's so much rich data that CalRecycle has a lot of experience with now since AB901. In these cases, they are the ones receiving the information and understanding it. They have the relationship with the landfill operators about where these tons are coming from, there could be even more transparency for local jurisdictions when materials are delivered that they say they are from the jurisdiction. But who are they coming from? We have a tight C&D ordinance that doesn't require any C&D to go to landfill and yet C&D is showing up at landfills. So I really support these two recommendations, and I would be very interested in CalRecycle to find out where materials not handled by jurisdictions are coming from.

Recommendation T

I really support this recommendation and pathway. Specifically, the Global Recycling Council of the California Resource Recovery Association did a geographic research project to look at what's really going on with regards to landfill reduction. Basically our landfill disposal rate has not really gone down since AB 939. We're still at that under 50% diversion rate. We looked at it, and there were very big differences geographically. For example, there are many communities that have had their landfill, their destructive disposal tonnage cut in half since 1990. What can we learn from some of the communities that have already done this? We have a lot of data that needs to be presented and analyzed. Looking at 2008 rates, and urban and regional issues, and understanding the requirements. What are the problems? Let's use the data and the infrastructure. Celebrate the accomplishments and delve into the problems.

Recommendation U

I really wanted to acknowledge Valley Improvement Project's leadership in this issue and all that they've been able to accomplish.

I think that there's really strong support for the idea of environmental justice and not picking on different areas for the siting of some facilities. But I think we also, as a corollary need the YIMBY, the "yes in my backyard" for other types of facilities where we are under-resourced. For example, those would be things like the refilleries, but also resource recovery parks, compost hubs, tool lending libraries. We have a lot of serious opportunities for yes-in-my-backyard of zero waste facility solutions that would be welcomed in the rural areas, in the Tribal areas in the areas of our environmental justice communities, that might otherwise be under-resourced for these ideas. I absolutely support the recommendation.

Recommendation V

We should address the faith community, the churches, mosques, synagogues, and temples where people gather. Also schools. Those are really great channels for meeting people. There are statewide

organizations and organizations that work with schools and faith organizations that can reach out to their members. Interfaith Power and Light would be an example where they actually work with their faith community members to support programming in climate reduction. They could easily support zero waste solutions.
In the city of Alameda, for example, folks there have conducted workshops with their faith organizations specifically to highlight their work in zero waste. If you are able to green your school community or your church community, you can then reach out to the congregation or to the families that bring the students to the church at the school, everyone in their neighborhood. Since everyone comes there, I think formalizing those connections or working with those channels and the faith organizations and the school organizations to get to where the community actually shows up would be a recommendation.
Other Comments:
Keep sources separated. And we did have a recommendation from the Global Recycling Council, the California Resource Recovery Association and a recommendation of the statewide commission on Recycling Markets and Curbside Recycling: ensure complete separation of biological and technical nutrients. We talked a lot about circularity today. The big issue around circularity is keeping the biological systems and the technical systems separated. If you recall the butterfly diagram from the Ellen MacArthur Foundation, that is the big issue there is keeping those systems separate and unmixed. For example, New Zealand has banned plastic produce stickers, in addition to produce plates, bowls, and cutlery and straw. We do have laws around single use plastics. Plastic produce stickers are still emergent, which is a contaminant in our compost system. So thinking from the point of view of zero waste is the upside down pyramid with Rethink Redesign at the top and the circularity opportunities, keeping those biological and technical nutrients completely separate so that we are not cross contaminating our streams. We don't want any food scraps in the recycling. We don't want any recycling in the food scraps and vice versa. That hadn't been sort of emphasis before with regards to the references to the circular economy.

Comment 4:

Name: Rick Anthony
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation A
I have been working on this for 50 years, and watched the process go through changes. CalRecycle has the responsibility to give the Governor policies on sanitation and waste reduction and be serious about facilitating a closed-loop economy. Single-use products should not be sold in CA. We need more advisory opportunities so that people can share knowledge with CalRecycle.
Recommendation B
The Zero Waste Plan is using a proper process by starting with public input. Next, “avoids analysis” - where can things go in the system, and where are there gaps such as Pay As You Throw, and waste analysis. Please continue to keep Zero Waste Plan development open to the public.
Recommendation E
The real problem with getting compost facilities permitted was a need for an EIR for each facility. At this point, there is enough composting happening in the state that we should only need to analyze things like water and traffic issues for each new compost facility site (and not need a full EIR). Also, I have seen some examples like “Gray Paper Company” a small, 50 ton per day paper mill which are small, self-reliant recyclers. We have smelters, but as far as plastics, the oil companies are screwing everything up.
Recommendation H
Back in 1988, with IWMB/STAR act, “we” put together a “reverse depletion act” that specified that a secondary material processor would get the same depletion allowances as the virgin materials. One big recycling problem is that we keep using up our virgin materials. One way to fix this is to get rid of the depletion allowance that they have, or add the same amount to the secondary material. If that happened, the recycling market would flourish.
Recommendation P
We do a lot of “boots on the ground” - going out to unincorporated areas and talking to people who need to have a blue bin or a green bin – and what we’re finding out is they just don’t understand what they’re supposed to do. It seems like we need a better education system. Maybe part of Zero Waste Plan could be

saying that “you have a blue bin for recycling, and a green bin for organics, and you also have a black bin for waste; but that black bin may go away soon”.
We’re finding a huge population that doesn’t have garbage service – they basically take their own materials. Example: mom and pop businesses. There’s rarely a place for them to source-separate material at the landfill; so this complicates the issue of separating out durable goods from the landfill stream. Overall, we’ve done a good job in CA getting folks set up with curbside collection; but we have not done a good job with smaller businesses.
We piloted fix-it clinics in 8-9 jurisdictions, including LA County and San Diego County –these programs were well-attended and popular. These could be a good way to get people engaged in reuse. Also need to address bulky materials.
Recommendation T
How does this help us meet the 75%?
Recommendation V
If we want to get this done, you have to go to the top, get cooperation from the managers. If you offer a program and make it convenient and available, people will go to it. If the school district doesn't say “this is the rule in the state of California” and advise maintenance directors “please make sure your custodians do this”, then it won't happen. The teachers can't do it. They can only show them what to do, but the custodians ultimately handle the material. The same thing happens in Tribes. We got some really good cleanups going. When we started to say that we want to require this kind of separation, we got a lot of pushback. Today, I think CalRecycle could say to all management organizations, “This is the way we handle our discards in California. And we want you to comply.” And if we can get the top to agree, then we'll get it done.
Other comments:
We’re addicted to curbside collection. You should look at what's happening in other countries about responsibility and who does what where. Go to Italy, and recycling vendors go door to door for collection. In Kerala, India, you are responsible for what you do. Before the end of the war, the haulers picked up the garbage to feed the pigs. Rag dealers picked up bottles, cans, and rags. Look at what’s happening in India and Italy. In old days in India, food dropped on the ground was eaten by animals, and everyone was a part of that society. Kerala was absolutely amazing in how much it was part of their part of their culture. But today, one of the animals will go to eat, there isn't the food on the ground. There are all these packages instead. And I got more than one picture of cows inside trash cans looking for trash, eating plastic.
Our biggest problem is greenwashing of compostable plastics bags. We are accepting the argument that they’re going to decompose. And they aren’t. We’re polluting our soils with plastic throughout the United States by allowing these bags. You should do a study about what's going to happen to the soils in California if we keep adding plastic to the soil.

Comment 5:

Name: Heather Trim
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation B
Washington State is very interested to see how you develop the plan; we may want to do something similar in our state. I’m leery of the term “circular management” – we need to move away from “circular.” There are two problems with the word circular. One problem is it doesn’t mean stopping some of the stuff that we need to stop, it just means perpetuating it because we can recycle it. But the other is the toxics element of it and so much of the stuff we are dealing with right now has a toxic element. We don’t want to recycle that thing back into the system or recycle things to others that might be impacted by it. I’d love to see different framing – something other than circular would be very helpful. I would love to see something more dramatic, exciting, and strategic.
Recommendation E
We need EIRs for each of the facilities, CalRecycle should simplify the regs to make it easier for organics infrastructure. Paper mill and glass plants should be more local.

Comment 6:

Name: Stephanie Barger
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation B
What we do in CA affects the nation/world. We need a circular/closed loop and EPR ties into this. We need to focus on “low-hanging fruit” - I live in Placer County, and it only has one bin for all waste to go into. There is no infrastructure in rural areas, and we need to have immediate action take place.
For businesses, we need to lean in and get robust business circular materials management, build local markets. Especially with online shopping and Amazon, it’s important to have source-separation of cardboard and packaging. There is a reason to focus on businesses so they can quickly and effectively source-separate. Napa is a good example. My organization worked with wineries, finding reprocessors that can handle materials from wineries; within 2 years, 70% of winery materials were closed loop, and hundreds of thousands of dollars were saved.
Recommendation C/D
Also a public sector program should be self funding - i.e., if we are source separating materials - then we should be generating income. If the focus is on reduction and reuse then that lessens the burden on the government and citizens.
Recommendation D says “zero waste and circular”, but other recommendations just say “circular”. So much of hard-to-recycle items are from single-use, throw-away items (birthday parties, glitter, etc.). We need to be empathetic to consumers, understand the amount of mixed messaging that is occurring. Please lean in to zero waste and emphasize terms “reduce and reuse”, not just focusing on trash and recycling.
Recommendation F
We are all reprocessors and those reprocessors are key to our TRUE program; we work a lot with cardboard, glass, and plastic reprocessors, not recyclers.
Recommendation I
I appreciate this category on partnerships – it is one of most important. I want to emphasize this should be a very easy opportunity. We are all partners - organizations, National Recycling Council, we are already working with community organizations. It’s important to get up to speed quickly. The CALPRG facility is TRUE certified, and we are working on TRUE for construction and working with stadiums. FIFA (World Cup) and Super Bowl are coming to CA.
Recommendation O
We have some amazing programs in CA related to oil recycling. For example, outreach was done that focused on people that change their own oil. We already have some really good awareness campaigns, so we don’t need to spend more money on recreating that. Haulers sometimes misinform their customers about source-separation specifics – we need to “go back to basics” re: source-separation education. For retailers, the new initiative to not hand out disposables, or to have to opt-in for receiving napkins and condiments, should be promoted as a good business case and a way to save money--this fact needs to be key to communication and awareness. By reducing and reusing, businesses can be more successful. It’s not about penalizing businesses.
Recommendation U
Let’s not underestimate the Tribes. I want to highlight the UCLA presentation on oil/plastics/natural gas (Luskin).
Recommendation V
Working with faith communities and schools is critical. Keep it as local as possible when doing outreach, just like when you're doing community planning for building and infrastructure. Placer County is going through a General Plan, and it would be great if zero waste was in the General Plan. Just because of all the building that's going on and you have people in one place. Leveraging existing community actions that are going on would be helpful.
Don’t forget the business community. Have everything in multiple languages, such as presenters in Spanish, so that everybody is engaged. The Tobacco Use Prevention Coalition is a great template as they had to reach out to many different communities and I think had their materials translated into 50 to 100 languages.

Comment 7:

Name: Renee Sharp
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation B
We need to get away from the term “circular.” It’s a word than can mean lots of things or nothing – For example people hear that and they might think recycling, but if we moved away from using single-use plastic and more towards reuse – non-plastic reuse – that's actually doing a better job of reducing waste. But it may not be what people think about when they see the word “circular.” Also, the industry calls it circular – but may not actually be. For example, taking a plastic and turning it into chemicals, and taking those to make fuel and burning them – this is not circular. Also want to echo concern about circularity and continuously circulating toxic chemicals in our products. We need to make sure our processes that we are using for recycling are not toxic – we need to get to a place where we have non-toxic processes, not only zero waste, but less harmful chemicals in our lives and entering the environment.

Comment 8:

Name: Jade Goegebuer
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation H
It is not mentioned enough: the impact that the manufacturing industry has on infrastructure. I’m not sure where it fits in the plan - their part, producer responsibility; and also what they are going to be required to do. Beverage companies – they push toward switching from plastic to aluminum but are claiming there is not adequate infrastructure or accessibility.
Recommendation I
Partnerships can have involvement with haulers or composting facilities, not a deciding factor.
Recommendation M
Saying “circular” instead of “zero waste” can lead groups to doing things that shouldn’t be included, like pyrolysis. Make sure “zero waste” is well-defined, with examples of what it can or can’t include. Beware of greenwashing

Comment 9:

Name: Nancy Deming
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
Recommendation T
Jurisdictions are spread thin and shouldn’t have to recreate the wheel for resources. School districts also need resources to access tools, research. We need best practices and messaging, materials and resources for schools.
Other Comments
Understanding greenwashing and its impact is important. I’m frustrated at local Starbucks advertising compostable cups, when it’s not. It's a landfill item. And that just sets us back. I’m struggling to support schools on the best types of packaging to do when they buy a compostable plastic utensil system for our whole district that is actually not really compostable. It’s greenwashing. This impacts our waste stream. People get confused.

Comment 10:

Name: Tom Helme
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:

Recommendation U
Make polluters pay. That's always been a call of the environmental justice movement because we get the excuse that there's just not enough funding for these programs that we need to make zero waste work in environmental justice communities. We need to make sure citing of facilities in disadvantaged communities does not continue, and assist with cleanups of sites, also concerned about chemical recycling. Waste should not be a commodity. We want to see more source reduction, more investments in EJ communities, pilot programs for reuse and refill.
Other Comments:
I want to echo comments about environmental groups and present some resources CalRecycle may already be in contact with: Environmental Justice Communities Against Plastics, East Yards, PSLA, VIP is part of that group, CEJA, CEJC, some waste related groups like Gaia, Ecology Center, groups like Heal from Avenal whose main issue is the nearby landfill, and CJC (founded around toxic waste issues). We were just at a hearing in Fresno advocating against DTSC's plan to send contaminated soil to local landfills, which would just dump more on the same environmental justice communities. Hazardous waste landfills in California are also in environmental justice, Latino, Central Valley communities. Californian Communities Against Toxics' Jane Williams is on top of regulations and policy. I know CEJC also has connections with some Tribal groups like California Indian Environmental Alliance.
There's been a big push to try to commodify agricultural waste into use in mostly polluting industries like making biofuels and biogas. We have been hearing a lot about bioplastics that we want to ensure they are not filled with more toxics and are suitable to be composted in California facilities.
Along with Zero Waste USA, we did a local zero waste plan in anticipation of getting away from the incinerator and have a whole host of recommendations, including a really free market, a household yard sale. We take in donations of clothes, and we had over 100 people line up. Repair workshops, library of tools and other items, strategies for reducing food waste, food banks, community composting.

Comment 11:

Name: Amanda Riley
Date received: 3/26/25
Source: Listening Session
Attachment(s): N/A
Comment:
I am concerned about enforcement in the laws and processes we set up. For example not allowing greenwashing. And enforcement for illegal dumping of compostables.
I don't think fully circular is possible, like fully zero waste is not 100% attainable because of things like toxins. And most plastic is "downcycled."

Comment 12:

Name: Tedd Ward
Date received: 4/9/25
Source: Email (**Tedd@recycledelnorte.ca.gov**)
Attachment(s): Yes, Non-text items incorporated into documents submitted to CalRecycle are not reproduced here
Comment:
Dear CalRecycle Zero Waste Staff:

Thank you for this additional opportunity to provide feedback on the California Zero Waste Plan being developed by Accenture and the Rural Zero Waste Infrastructure Plan being developed by the Rural Counties' ESJPA, Sweetser & Associates and HDR, Inc. This letter is being submitted by the Global Recycling Council of the California Resource Recovery Association, a technical council that has focused on promoting Zero Waste plans and practices for over twenty-five years.

Generally, responding to the current status of planning is challenging, as what has been shared regarding current document development is so broad and unspecific. Core to these concerns is the need to recognize the international definition of Zero Waste, the only internationally peer-reviewed definition. There are other descriptions of what a Zero Waste vision might achieve, but this is the only definition agreed to by the leaders of Zero Waste worldwide. As California's efforts to move towards a circular economy are frequently referenced, it would be appropriate to define both of these terms and to further describe how Zero Waste policies,

programs and infrastructure complement other efforts to move California towards a circular economy.

We recommend recognition of the internationally peer-reviewed definition of Zero Waste:

> "Zero Waste: The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health."

The key emphasis is that Zero Waste systems do not include burning. High temperature treatments[1], such as pyrolysis, gasification and chemical recycling are considered destructive disposal. It is imperative that California's Zero Waste Plan recognize this distinction with respect to management of municipal discards.

We also recommend adoption or recognition of the definition of "Circular Economy" in the recently updated Zero Waste Hierarchy of Highest and Best Use:

> "Circular Economy: An industrial economy that is, by design or intention, restorative· and in which material flows are of two types, biological nutrients, designed to re-enter the biosphere safely, and technical nutrients, which are designed to circulate at high quality without entering the biosphere. Materials are consistently reused rather than, wasted. All options that cause leakage or losses of material from their circular management (such as incineration,
> co-incineration, fuel production, fuel use, and the like) are not part of a Circular Economy system. Circular economy should be clearly defined to follow the Zero Waste Hierarchy and not show energy recovery as a process prior to landfilling."

As requested in the Listening Session Discussion document, the following suggestions are structured to address the Recommendations and Pathways described within the CalRecycle Zero Waste Plan Listening Session Discussion Document.

Policy and Regulation

A. Review and refine existing policies, programs, regulations and statutes to align incentives and requirements with materials' highest and best use

A.2. Add: Both Zero Waste and circular economy efforts call for the separation of organic and technical materials, and maintaining such separation is critical to controlling costs for separation and contaminant removal.

An illustration of this concept is the Cradle to Cradle Design Framework popularized by William McDonough (see below).

Add: A. 3. Support ongoing surveys and data compilations regarding illegal dumping, litter, and contaminants removed through stormwater controls or other programs, as these are all material disposal modes that undermine Zero Waste efforts and will therefore provide guidance regarding priority material and/or product targets for further Zero Waste programs by demonstrating where existing policies are proving inadequate.

Add: A.4. Ensure complete separation of biological and technical nutrients.

In a cradle to cradle design framework, everything needs a sorting opportunity. Identifying materials and products that combine technical nutrients and biological nutrients should be prioritized for redesign and ultimately banned from production.

California statute requires recovery of recyclable and compostable materials. However, the barrier to circularity in recycling technical nutrients and composting biological nutrients is the prevalence of products and materials that are composites (such as plastic stickers on produce, plastic backing on jute rugs, food served or sold in plastic packaging). Policy is needed to ensure complete separation. For example, New Zealand has banned plastic produce stickers in addition to produce, plates, bowls, cutlery, and straws.

B. Adopt a California circular materials management framework to develop and implement policies that prioritize source reduction, waste prevention, and proactive circular materials management.

Comment: The discussion document uses the terms circular and circularity. However, Zero Waste is a more holistic concept that includes the concepts of rethink/redesign, reduce and reuse. Please refer to the Zero Waste Hierarchy of Highest and Best Use. These three concepts are included in the top tier of the hierarchy.

Now refer to the circular economy "butterfly image" from the Ellen McArthur Foundation. Circularity focuses on the middle tier of the Zero Waste Hierarchy, recycle/compost, material recovery.

Zero Waste and circularity should not be used interchangeably and the Zero Waste Plan should focus on "upstream" measures. We recommend only referring to circular and circularity when actually addressing recycling and composting improvements. These are essential parts of a Zero Waste system, but they are not the whole story. We strongly recommend that the California Zero Waste Plan use a Zero Waste Framework.

Financial Mechanisms

C.1. Add: Provide a direct comparison of supports for resource extraction and processing in California and comparable supports (if any) for commercial and government efforts to recover those materials.

C.2. Add: Eliminate subsidies for over-production and extraction.

As described in California's Statewide Commission on Recycling Markets and Curbside Recycling June 30, 2022 Policy Recommendations Report, most counterproductive incentives are Federal. Therefore, California must lead, through our elected representatives and our bully pulpit, to eliminating counter-productive incentives and implementing incentives for recovery and sustainable circular economics at the Federal level.

Infrastructure for Circularity (replace with "Zero Waste")

Add H.4 Rebuild transfer stations and create Zero Waste infrastructure through the development of resource recovery parks

GRC has long advocated for the development of resource recovery parks and in 2001, the California Integrated Waste Management Board funded a case study on this topic:

"Resource Recovery Parks: A Model for Local Government Recycling and Waste Reduction." Resource recovery parks address that portion of materials that are largely unaddressed by state and local policy: self-haul and drop box materials. These unregulated material streams are a significant and growing portion of what is landfilled in California. For example, only 62 percent of material landfilled from Oakland and only 68 percent of material landfilled from • San Francisco in 2022, came from their exclusive service providers.

Add H.S. Support "Yes In My Backyard" (YIMBY) Community-Based Infrastructure for Tool Lending Libraries, Fix-it Clinics/Repair Fairs, Refilleries, and Community Composting

Research and Innovation

L.4. Foster training of reuse, recycling, composting, and solid waste professionals in identifying service voids and service opportunities within their community. Service voids exist in any community that does not have a system for reuse, or a system for collection and processing of a material or product for recovery. Service opportunities exist for materials that continue to be disposed of even though at least some programs may be available to reuse or recover such materials or products. In either case, movement towards Zero Waste includes expanding programs to eliminate service voids and address service opportunities.

LS. Add: Provide education, training, certification, grants, and technical assistance to local jurisdictions.

California statutes and CalRecycle regulations place the burden of responsibility for waste diversion compliance on local jurisdictions. However, many jurisdictions do not have the expertise or staff capacity to address current requirements. In pursuing Zero Waste, California must change this dynamic. CalRecycle can provide direct support to jurisdictions through education, training, certification, grants, and technical assistance. For example, the Municipal Assistance Coordinators (MACsl in Massachusetts provide technical assistance to local jurisdictions in drafting Requests for Proposals and contracts with service providers for solid waste, recycling and composting services, share information between communities, and support communities in applying for state grants (including the Recycling Dividends Program). CalRecycle can also build on the success of the Front Range Waste Diversion Program (FRWD) in Colorado that provided grants to communities to develop Zero Waste Plans for their communities or the new Colorado Circular Communities Enterprise that provides direct consulting support. By implementing programs like this as soon as possible, greater support will be generated for the adoption and implementation of the initiatives recommended in the California Zero Waste Plan.

Again, thank you for this additional opportunity to provide input to these plans. We are delighted CalRecycle is engaged in this planning and the Global Recycling Council intends to remain engaged in these discussions to ensure the recommended initiatives are as successful as possible.

Respectfully,

Tedd Ward, Co-Chair

Global Recycling Council of CRRA Tedd@recycledelnorte.ca.gov
Footnotes
[1] Any process over 212 degrees Fahrenheit

Comment 13:

Name: Nick Lapis
Date received: 4/9/25
Source: Email (**nicklapis@cawrecycles.org**)
Attachment(s): No
Comment:
Dear CalRecycle Team,
Thank you for the opportunity to provide comments on the draft Zero Waste Plan. As an organization committed to advancing zero waste and circular economy policies in California, we appreciate CalRecycle's leadership and ambition in setting California on track towards a zero waste future. Nonetheless, the concepts that have been provided thus far do not go far enough to meet California's statutory and environmental mandates, nor does they reflect the urgency of the moment. We respectfully submit the following recommendations to strengthen the Plan:

1. Recommendations Must Be Actionable, Specific, and California-Centric

The draft concepts currently read as a list of generalized aspirations. To be effective, the Plan must include clear, actionable recommendations with timelines, responsible entities, and measurable outcomes. Moreover, recommendations should be grounded in California's specific regulatory framework, infrastructure, and market conditions. Without this level of detail, stakeholders cannot meaningfully assess progress or hold parties accountable.

2. CalRecycle Must Make Clear Commitments to Specific Actions

The Plan should not merely encourage or suggest action by others—it must outline concrete steps that CalRecycle itself will take. This includes regulatory updates, program development, data transparency, and enforcement measures using existing authority. As the lead agency responsible for implementing the state's waste management priorities, CalRecycle's leadership must be front and center in this Plan.

3. Ground Recommendations in Proven Models that Increase Circularity

CalRecycle has the benefit of having in depth experiences managing a variety of recycling programs, both directly and through regulation of producer responsibility organizations. Each of these programs has had both marked successes and missteps to learn from, so a robust Zero Waste plan should carefully review all the existing programs to identify best practices that can be replicated for other materials. For instance, Plastic Market Development Payment (PMDP) program has proven to be a cost-effective model for market development, with guaranteed incentive payments tied to actual material usage, as opposed to grant-based programs that haven't proven as successful. Similarly, the Department's programs have shown the effectiveness of deposits, recycled content requirements, low-interest loans, direct takeback requirements, and other strategies that could be applied more broadly. Recommendations in the Plan should be informed by these successes rather than reinventing the wheel.

4. Address Statutorily-Required Components, Including Edible Food Recovery and AB 341

The Budget Act that appropriated funding for this plan laid out several explicit requirements:

- evaluation of whether newly established and recently expanded programs are aligning with their intended goals;
- identification of additional strategies needed to achieve the statewide goal of having at least 75 percent of solid waste generated be source reduced, recycled, or composted, as well as the edible food recovery goal established by paragraph (2) of subdivision (a) of Section 42652.5;
- analysis of state and local jurisdiction efforts and opportunities to more quickly transition from municipal waste incinerators to strategies that help achieve air quality goals;
- recommendations for legislative changes, if any, that are necessary to achieve the statewide goal.

The draft concepts have not explicitly addressed these statutory requirements so far, and we urge the Department to ensure that the final plan dedicates significant detail toward addressing these important items.

5. Align Definitions with ZWIA and California's Waste Management Hierarchy

The Plan should adopt the Zero Waste International Alliance (ZWIA) definition of Zero Waste, which emphasizes the elimination—not just management—of waste through redesign, reduction, reuse, and recycling. Further, the Plan must distinguish true recycling from "recovery," and align its language with

California's own waste management hierarchy, which prioritizes source reduction first, followed by reuse, recycling, and composting—not landfilling or incineration under the guise of recovery.
In closing, we urge CalRecycle to continue to engage stakeholders to ensure the Zero Waste Plan includes specific, bold, and enforceable actions that reflect California's leadership in waste reduction and environmental sustainability. As you are aware, the Department's predecessor, the California Integrated Waste Management Board had previously developed a series of Strategic Directives to guide the state's waste reduction efforts. Subsequently, CalRecycle issued a strategy for achieving the 75% source reduction, recycling, and composting requirements of AB 341 (Chesbro, 2011), and the Statewide Commission on Recycling and Market Development also issued detailed recommendations on achieving these goals. It is imperative that the Zero Waste Plan build on this previous work and develop an actionable framework for the state, not serve as another document that will gather dust on a shelf. We look forward to collaborating with the department to realize a truly zero waste future.
Sincerely,
Nick Lapis
Director of Advocacy

Workshop - October 1, 2025

Comment 1:

Name: Christina Pestoni
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
Get zero waste into our school curriculum. Streamlining goes back to the agencies. Lack of getting permits and compliance needs to be addressed quickly.

Comment 2:

Name: Dana Stueland
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
Interested in partnering with local CRV facility or CalRecycle and get funding for a reuse/repair center.

Comment 3:

Name: Erika Kimball
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
Add more healthcare sustainability strategies and include healthcare systems in closed loop considerations. Lots of opportunities and exciting research - e.g., total cost of ownership, how to invest in human capital. For needed infrastructure, green opportunity to research at regional level for what is needed from washing or composting facilities. Integrate public agencies like Department of Public Health, use statewide materials to further local community well being.
Training is a powerful tool for cultural and behavioral change. There's a workforce development opportunity in the healthcare field (14% of workforce). Include specific call outs on developing human capital to participate in the circular economy.

Comment 4:

Name: Evan Edgar
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
Hierarchy needs composting and energy recovery. Plan should include GHG/net zero emissions and costs, and focus on getting to 75% before getting to zero waste. More quantitative information needed.

Need modeling tonnages, cost analysis including Advanced Clean Fleet, and alignment with carbon neutrality goal by 2045. Should include future of grant funding for zero waste including edible food recovery, and raise the tip fee. Include quantitative data.
Include case studies on South San Francisco anaerobic digester (AD) facility or CR&R AD Facility. Besides Urban Ore there are other resource recovery parks that focus on energy recovery/woody biomass. E1 and E2 have been attempted before. E3 Tribes have good knowledge to share on burns. F3 important to match wood waste. F4 should keep happening, more source separation
G1 Add carbon credits. Natural working lands and carbon offsets have a current bill. G2 Highlight Marin Carbon Project, scale out successful LA projects. G3 Scale out research on carbon credits, impacts to ghg, benefits of sequestration. G4 Break down silos. H1 should include community compost hubs. H2 Incentives to include carbon credits. H3 Align with AB 32 scoping plan
K1 Important to integrate data across agencies. K2 Great existing work, Voluntary carbon markets/credits would help people be net zero (Climate Action Reserve platform for nonprofits). K3 Good studies exist, Would be good to have RDRS data more quickly. L Expanded data analysis, especially on biomass, would be great. L3 Priorities should include PFAs, wood waste, microplastics. L4 Impacts to monitor should include ghg emissions
M2 and M3 should be highlighted in case studies. Connect Plan with other documents such as rural analysis and CARB scoping plan.
O1 Tracking exports should be able to show proof of recycling. O2 GHG should be included. O3 Materials management partnerships are important.
ZWP should have full quantitative analysis with 75% modelling of tonnages and GHG. Hierarchy should include energy production from organics, use the federal EPA food waste hierarchy.

Comment 5:

Name: John Doyle
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
H1 Consider engaging the young public, school districts can develop a pipeline to university research. Include this group holistically into the plan.
Engage school districts and students.

Comment 6:

Name: Shira Lane
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
Fund building of reuse infrastructure and create funding for jurisdictions to participate. Can climate investments fund more zero waste projects?
Collaborate more with Arts Council, local artists. Create grants systems to support jurisdictions with reuse facilities and make them open to the public.
Thank you for these recommendations. Work with places that education on redesign.
Connect with creative communities that are embedded locally and understand the local issues, differences not only in language but also culture so needs and approaches should be different.
Reuse is hard to measure. How can we create a reuse infrastructure that records that data in a new system? A realtime dashboard of where data is located would be great.
Prop 28 passed funding for arts in schools, would be interesting to see how art can be taught through sustainability.
Will this report be used for grants? A lot of education is needed to train people on circular economy, should look at how training is done at other departments.

Comment 7:

Name: Tedd Ward
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A

Comment:
Look at Ellen McArthur model for circular economy, separate organic and technical materials.
Need more details on implementation (how the circular behavior will be incentivized and materials will be kept local).
Support libraries and facilities that separate at point of drop off. Labor cost is a challenge, how can we support financial sustainability for these volunteer based orgs? Reduce overproduction of plastics in agriculture and other industrial spaces, not just focus on consumers.
Reduce the variety of non-recoverable materials entering the material stream (e.g., explosives, flammables, 3D printers).
Education and training is needed for professionals in the solid waste industry (what EPR is, how it's implemented). CalRecycle should support these trainings.
There will be opportunities for regional efforts in community engagement and capacity building especially with SB 54 funds. Deployment of these funds would help build capacity, especially in rural areas, to address interjurisdictional issues like illegal dumping and identification of incompatible materials that don't have recovery pathways.
No mention of partnerships with universities, need curriculum and training of chemical engineers and environmental toxicologists. There are also opportunities for increasing training and resources on product stewardship programs to make them more uniform, robust, and efficient. Other important partnerships include business and industry that foster circular activities (e.g. loan libraries, repair, reuse services that replace single-use, salvage/resale). These sectors are declining and should be increasing.
Hierarchy needs to distinguish technical and organic materials, and include salvage, reuse (repair, refill) and refuse.

Comment 8:

Name: Tony Hackett
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
The recommendations are useful. Perhaps instead of making changes we should focus on actionable commitments.

Comment 9:

Name: Veronica Pardo
Date Received: 10/1/25
Source: Workshop
Attachment(s): N/A
Comment:
Progress and policy take time. This is high level document that includes historical efforts which may or may not have been successful. It will be important for the legislature to understand that. We have capacity and infrastructure issues for organics, biomass management could be improved. How will CalRecycle move this plan forward?
L3 Should include PFAs, composters are passive receivers of this pollutant. Industry needs to separate technical and organic materials.

Comment 10:

Name: Evan Edgar
Date Received: 10/15/25
Source: Email (**evan@edgarinc.org**)
Attachment(s): Yes, Non-text items incorporated into documents submitted to CalRecycle are not reproduced here
Comment:
Edgar & Associates has participated in every Zero Waste Workshop and provided extension verbal comments, as well as written comments, and Newsletters to you and your staff. None of this information was incorporated or considered in the Draft Zero Waste Plan and will provide summary comments once again into the record. There has been no feedback on why this information was discounted or not considered. There has been a lack of transparency and stakeholder input due to lack of material to comment on.

Request for Transparent Docket

We have asked repeatedly that CalRecycle post up all comments received in a docket that is readily accessible for all parties to see such as what occurs at CARB. There is no method to view other comments or issues or feedback on what has transpired to get to the Draft Zero Waste Plan. There is no transparency. CalRecycle hosted a Workshop on the draft Zero Waste Plan on October 1, 2025. The Draft Plan is a top-down light weight platitude of concepts that are rehashed over the years without any analysis, modeling, or substance. The Draft Plan does not define zero waste, does not model tonnages with programs, does not recognize the Federal EPA organic waste hierarchy, does not conduct a greenhouse gas reduction analysis, and does not mention biomass or hydrogen.

The $2 million CalRecycle Zero Waste Plan contract with Accenture was supposed to model zero waste in 2035, 2040, and 2045 and instead has no modeling at all... CalRecycle should not expend resources on achieving these impossible scenarios of 2035 and 2040 but should instead model the 4 scenarios include modeling 75% by 2030, GHGs, fleet profile, and costs. CalRecycle should stick to modeling zero waste by 2045 and determine when the current mandates of SB 1383 and AB 341 of 75% diversion can be met in 2030. The Legislative Analyst Office and SB 101 (Skinner, 2023) agree with the approach of meeting a current 75% mandate first. Since the AB 341 statewide diversion rate is only 41% in 2022, modeling zero waste in 2035 and 2040 would be a futility in neutrality while ignoring 75%. CalRecycle should determine baseline costs and then run several models to determine the increase in costs in order to keep solid waste and recycling affordable.

Accenture has 779,000 employees with operations and offices in more than 52 countries and over 200 cities worldwide with annual sales of $65 billion but can't interview stakeholders here in California. Accenture fumbled the contract as the proposal calls for tonnage and GHG modeling, impacts to waste streams, and economic impacts; where we see none of this in the Draft Plan.

Zero Waste Definition:

Since the jurisdictions are your main stakeholder to implement SB 1383 and AB 341, a zero waste definition should align with the cities. Zero waste has been described in various ways by different entities, where CalRecycle needs to define what 'Zero Waste' means to California. The United States Conference of Mayors adopted the following principle to define zero waste:

> **WHEREAS,** the concept of zero waste goes beyond recycling and composting at the end of a product's life cycle, to encompass the entire life cycle of a product, beginning with product design, and envisioning the use and management of materials in ways that preserve value, minimize environmental impacts, and conserve natural resources; and
>
> **WHEREAS,** materials management through zero waste can begin to shift the fiscal burden of waste and empower industry to embrace resource responsibility by rewarding stewardship through purchasing and economic development incentives; and
>
> **WHEREAS,** while industry and the federal government have variously defined and categorized zero waste strategies, it behooves the nation's cities, with primary responsibility for waste management, to devise a definition that encourages shared fiscal responsibility and legislative innovations,
>
> **NOW, THEREFORE BE IT RESOLVED,** that The United States Conference of Mayors adopts a definition of Zero Waste, and set of Zero Waste principles, that recognizes a Hierarchy of Material Management

Beside just tonnage information, zero waste principles include resource conservation, rewarding stewardship, life-cycle assessments, greenhouse gas reductions, and shared fiscal responsibility. With the concept of zero waste going beyond just recycling the composting, the zero waste plan should have cost greenhouse gas calculations with lifecycle assessment, where the Draft Plan has none of that.

The CalRecycle Zero Waste Plan contract with Accenture calls for the following analysis below, that is not part of the Draft Plan. Accenture is in breach of the contract for not performing this work, and by not following the Federal EPA waste management hierarchy.

Waste Management Hierarchy:

Page 5 hierarchy tries to be cute with a bunch of R's but fails to incorporate the real organic waste hierarchy from the Federal EPA. The definition leaves out composting, anaerobic digestion, fuel production, and bioenergy. Where is 'Recovery' in the hierarchy?

Circular Economy Definition:

The Draft Plan missed the concept of the circular economy where there is a Technical Component for AB 341 and an Organic Component for SB 1383 as highlighted below. The Draft Plan bundles the two which is not represent of the current market. Of ideas and pragmas. The Ellen MacArthur Foundation captured the

essence of the circular economy in the diagram below, which is somewhat understandably nicknamed the '**butterfly diagram**'. The diagram tries to capture the flow of materials, nutrients, components, and products, whilst adding an element of financial value. It builds on several **schools of thought**, but is perhaps most recognizable influenced by Cradle to Cradle's two material cycles.

Greenhouse Gas Analysis:

The CalRecycle Zero Waste Plan contract with Accenture calls for as GHG analysis as copied below. Accenture is in breach of the contract for not performing this GHG work explicitly spelled out in their proposal.

> **Activity 4.5: Assess Impact of California's Waste Streams**
>
> **Overall Impact of California's Waste:** The team would begin this activity by doing a high-level assessment of California's waste impacts on the climate and the environment at large using existing data sources and calculation methodologies. This would involve calculating the associated greenhouse gas (GHG) emissions from the waste sector (defined as municipal solid waste landfills, industrial waste landfills, industrial wastewater treatment systems, and facilities that operate combustors or incinerators for the disposal of nonhazardous solid waste), drawing on US EPA Greenhouse Gas Reporting Program data for the sector. We would use EPA's Waste Reduction Model (WARM) tool to calculate high-level comparative estimates of the potential GHG emissions, energy savings, and economic impacts of materials managed in baseline compared to alternative materials management practices, including source reduction, recycling, composting, anaerobic digestion, combustion, and landfilling. We would also assess the impact of California's waste sector on the state's environment, including criteria air pollutants (i.e., carbon monoxide; oxides of nitrogen or NOX; sulfur dioxide; particulate matter; and hydrocarbons) and water pollution from associated leachate

Any Zero Waste Plan needs to quantify the amount of GHG emissions being avoided where CalRecycle can utilize the Federal EPA WARM model. In 2018, 27.2 million tons of waste was diverted from landfilling amounting to 43.98 million metric tons of GHG being indirectly avoided that embeds material lifecycle analysis into their calculations. Following CARB's Net-Zero Waste Sector GHG equation adopted in the 2013 Scoping Plan, the Waste Sector was 3.7 times Net-Zero GHG in 2018. The California Waste Sector Net Zero GHG Report prepared by Edgar & Associates was provided to both CARB and CalRecycle in May 2021 and has been ignored. This Report also projected to 2030, that should SB 1383 and AB 341 goals be met, an additional 28.3 million tons would be diverted, to total 55.6 million metric tons of GHG being indirectly avoided, increasing to 10 times Net Zero GHG, and with carbon negative fuel and carbon neutral bioenergy, the industry can be infinity times Net Zero GHG.

Tonnage Modeling:

The CalRecycle Zero Waste Plan contract with Accenture models zero waste in 2035, 2040, and 2045. Accenture is in breach of the contract for not performing this GHG work explicitly spelled out in their contract and proposal.

> **Activity 5.1: Develop Waste Profile Forecast for California (2030, 2040, 2045)**
>
> In order to appropriately develop a plan to reach zero waste by 2030, 2040, or 2045, the Accenture team will need to project the waste volume and waste characterization under the current state through those time periods to ensure that our recommendations are addressing not just the waste streams of today, but also the waste streams of tomorrow, with detail by material and industry. Figure 8 illustrates trends in different industries and opportunities for adding significant value to their transition to circularity – an example of the value opportunities possible for California:
>
> 2) The Contractor shall submit to the Contract Manager a comprehensive draft Zero Waste Plan using recommendations from the Recommendations Report, with three options for statewide zero waste by 2035, 2040 and 2045, as detailed in the Contractor's proposal by August 1, 2025.

Biomass and Hydrogen:

There is no mention of bioenergy or hydrogen production to get to zero waste as an emerging technology. Accenture is in breach of the contract for not performing this emerging technology review work explicitly spelled out in their contract and proposal.

> **Emerging Technology Review:** Our team will review emerging technologies in recycling, source reduction, reuse, and re-manufacturing to identify priority technologies that can be used to drive zero waste efforts or California's circular economy infrastructure. We will consult our existing Circulars Accelerator start-ups – including those based in California – and complement that with external desk

research based on the priority opportunity areas identified in Activities 4.1 through 5.2. In our technology recommendations, the Accenture team will prioritize technologies that are economically viable, energy efficient, able to work at scale, low risk for piloting, allow for the highest and best use of materials, and offer co-benefits related to implementation such as job creation. We will also be realistic about the challenges associated with these emerging technologies – identifying technologies that are ripe for immediate investment exploration as well as those that may be viable in the future and are worth investing in or monitoring.

Overarching Comments on the Baseline Report that were not considered:

The Baseline Report for the Zero Waste Plan was submitted to the California Legislature as directed by July 1, 2024. The Baseline Report focused on baselining tonnage data and presented the AB 341 statewide diversion rate of 41% in 2022 where there is a statewide goal to divert 75% by 2020 and for organics, 75% by 2025. The Baseline Report should also baseline the Waste Sector greenhouse gases (GHG), the collection fleet, and the costs in addition to the tonnages. The Baseline Zero Waste Plan needs to include additional components such as the following:

1. **Baseline Net-Zero Greenhouse Gas Analysis**
2. **Baseline Fleet Analysis**
3. **Baseline Cost Analysis**

1. Baseline Net-Zero Greenhouse Gas Analysis:

In 2018, 27.2 million tons of waste was diverted from landfilling amounting to 43.98 million metric tons of GHG being indirectly avoided following the Federal EPA WARM model that embeds material lifecycle analysis into their calculations. Following CARB's Net-Zero Waste Sector GHG equation adopted in the 2013 Scoping Plan, the Waste Sector was 3.7 times Net-Zero GHG in 2018. The ***California Waste Sector Net Zero GHG Report*** prepared by Edgar & Associates was provided to both CARB and CalRecycle in May 2021, and has been ignored by these regulatory agencies in the development of the CARB's Scoping Plan and their Advanced Clean Fleet rule and the proposed Zero Waste Plan development by CalRecycle. This Report has provided valuable information regarding the current circular economy and achieving a 75% diversion rate by 2030 with the associated GHG benefits and can be utilized to provide baseline GHG information.

Table 1. Net-Zero GHG 2018 Analysis Summary (Edgar)

Scope	Emission Type	Data Sources	2018 Amount
Scope 1	Landfill Methane	CARB	8,700,000 $MTCO_2e$
Scope 1	Compost Emissions	CARB	400,000 $MTCO_2e$
Scope 1	Fleet Emissions	CleanFleet.Net/TCR	825,000 $MTCO_2e$
Scope 1	Shipping Emissions	Edgar & Associates, Inc.	1,930,000 $MTCO_2e$
Scope 2	Electrical Emissions	Edgar/TCR	124,000 $MTCO_2e$
Scope 3	Avoided Emissions (Recycling and Composting)	WARM/CalRecycle	43,980,000 $MTCO_2e$

Avoided GHG Emissions (Scope 3)/Direct GHG Emissions (Scope 1 and 2) = 43,980,000/11,979,000 = 3.7X

This Report also projected to 2030, that should SB 1383 and AB 341 goals be met, an additional 28.3 million tons would be diverted, to total 55.6 million metric tons of GHG being indirectly avoided, increasing to 10 times Net Zero GHG. The Zero Waste Plan needs to include a Net-Zero GHG Analysis based upon life-cycle assessments.

Baseline Fleet Analysis:

The collection of waste and recyclable materials typically amounts to 75% of the cost of a program with 25% of the other cost being post-collection processing and disposal. CalRecycle should model the refuse

fleet component to achieve zero waste since the fleet will be transitioning to a zero emissions fleet with substantial costs and will recarbonize the fleet from being carbon negative utilizing renewable natural gas (RNG) from SB 1383 organic waste. The refuse fleet owners had been implementing the circular economy of today that CARB wants to replaced it with a carbon positive battery electric fleet transitioning towards global linear economy abandoning the circular economy.

The Waste Sector has been decarbonizing since 2000 with compressed natural gas (CNG) vehicles replacing fossil diesel in many communities, and renewable diesel is being utilized to replace fossil diesel. The solid waste industry has been producing our own renewable natural gas (RNG) from SB 1383 organic waste that is utilized in their own captive fleets and had no intention to produce biomethane for other hard to decarbonize industries. The solid waste industry has perfected the local circular economy that complies with SB 1383 by diverting organic waste from landfills, producing RNG from that waste and using the RNG in our own refuse fleets.

CARB adopted the Advanced Clean Fleet (ACF) Regulation mandating a transition to zero emission vehicles and away from RNG. CARB determined that the Heavy Duty fleets emit about 40 million metric tons of carbon dioxide equivalent (MMTCO2) in 2024 and decrease to about 18 MMTCO2 by 2040 with a 45% drop in GHG Emissions as shown in the CARB graph below. This should not be considered baseline information for the refuse fleet, since this data is for all heavy duty vehicles in California.

The baseline data for the refuse fleet shows 16,000 Heavy Duty vehicles in California as a subset of the ACF Regulations. The graphic below shows that since 2020, the GHG emissions have been cut 100% following the green line into carbon negativity. With the ACF Regulations, CARB will be re-carbonizing the refuse fleet following the orange line. Since 2020, the refuse fleet of 16,000 heavy duty vehicles has decreased their GHG emissions from 806,000 metric tons of carbon dioxide equivalent (MTCOe2) to a carbon negative 292,000 MTCOe2 in 2024 using RNG and renewable diesel. The solid waste industry was poised to be 100% RNG by 2030 where the GHG emissions would have decreased to a carbon negative 950,000 MTCOe2 amounting to 1,756,000 MTCOe2 in GHG emission reductions as shown on the green line in the graphic below.

Forcing electrification with the ACF Regulation, the solid waste industry will be re-carbonized where by 2042, the refuse fleet will be a positive 35,000 MTCOe2 of GHG emissions instead of being carbon negative at 950,000 MTCOe2 by 2030. The carbon intensity of California average grid electricity used as a transportation fuel in California for 2023 is **81.0 gCO2e/MJ** with the EER being 5.0 for heavy duty vehicles. The carbon intensity will decrease to **0.0 gCO2e/MJ** by 2045. With the ACF phase in and the California grid carbon intensity, the refuse fleet recarbonization is shown on the orange line.

California is unlikely to meet the 2030 climate goals at the current emission reduction rate while the Legislative Analysist Office that the 2022 Scoping Plan lacked clear strategy for meeting the 2030 emission goal. By adopting the ACF Regulations and phasing out near-zero engine options using RNG, diesel vehicles sales rise and renewable diesel supply continues to surge. CARB has dismissed the carbon negative refuse fleet solution that could have delivered as much as 950,000 MTCOe2 by 2030, but instead will push the refuse fleet into recarbonizing.

CalRecycle needs to model zero waste with zero emission vehicles as well as a 75% diversion plan with near-zero engines and using RNG and determine both the cost impacts and the GHG impacts, where it would show that zero emissions vehicles are carbon intensive and costly.

Baseline Costs Analysis

CalRecycle has published several reports of relative costs to implement programs including the following: *SB 1383 compliance could require potentially significant rate increases in some jurisdictions. The average cost increase to households is estimated at $3 to $5 per month, while the average increase to businesses is estimated at $70 to $90 per month.*

To implement SB 1383 with a standard 3-cart system, we see an average monthly cost of $35 to $40 per month using the current fleet. The average rate increases to implement the 3-cart system has been 20% to 30%. The costs to implement a zero waste plan with a zero emission fleets needs to be modeled compared to baseline to understand the relative costs to implement both these programs at the same time.

The zero emission vehicles lose half their payload due to the weight of the batteries and could cost twice as much, plus the electrical charging station will cost billions more. With the jurisdiction already passing significant rate increase to implement SB 1383, the jurisdictions should have the information on the potential rate increases to implement a zero waste plan with zero emission vehicles which could increase rates by 100%.

CalRecycle determine baseline costs and then run several models to determine the increase in costs to achieve the following mandates:
1. 75% diversion with a fleet of CNG vehicles running on RNG with the CARB certified carbon intensity values – for 2023 the average CI has been minus 119 grams of CO2/MJ.
2. 75% diversion while implementing the Advanced Clean Fleet rule using the CI value of the California grid to charge the battery electric vehicles.
3. Zero waste with a fleet of CNG vehicles running on RNG with the CARB certified carbon intensity values – for 2023 the average CI has been minus 119 grams of CO2/MJ.
4. Zero waste while implementing the Advanced Clean Fleet rule using the CI value of the California grid to charge the battery electric vehicles.
I look forward to discussing this with your staff. Please contact me at 916-444-5345.
Sincerely,
Evan WR Edgar
Regulatory Affairs Engineer

Comment 11:

Name: Joanne Brasch
Date Received: 10/17/25
Source: Email (**joanne@calpsc.org**)
Attachment(s): Yes
Comment:
Dear CalRecycle Zero Waste Plan Team,
The California Product Stewardship Council (CPSC) appreciates the opportunity to comment on California's draft zero waste plan. CPSC is a nonprofit organization dedicated to advancing producer responsibility and circular economy solutions that reduce waste, save local governments money, and protect public and environmental health. Our mission is to shift the cost and responsibility of managing products at end of life from taxpayers and local government and towards the producers who design and profit from them.
CPSC strongly supports and aligns with the detailed comments submitted by the **Global Recycling Council (GRC) of the California Resource Recovery Association,** particularly regarding the need for stronger definitions, measurable outcomes, and clearer accountability mechanisms in this plan. We echo GRC's call for CalRecycle to more clearly define **"zero waste"** to ensure the term reflects true circularity, preventing downcycling, prioritizing redesign and reuse over disposal, and addressing product design and material safety upstream.
We also support GRC's recommendation that CalRecycle build stronger cross-agency collaboration to prevent the introduction of hazardous or non-circular products, and to engage with other state and federal entities to combat illegal dumping, promote maintenance and repair systems, and facilitate circular procurement and leasing models within state operations.
CPSC commends CalRecycle for developing this statewide roadmap for circular materials management. The Zero Waste Plan outlines an ambitious vision to reduce waste generation, advance reuse, and repair, and invest in circular infrastructure that creates local jobs and supports disadvantaged communities. However, while the plan establishes a strong statewide plan, it does not yet provide the level of specificity needed for local governments, nonprofits, and stewardship organizations to design and fund new programs at ground level. A clearer implementation timeline, funding mechanisms, and measurable targets would help operationalize these strategies across diverse California communities.
CPSC strongly supports the plan on Materials Management Hierarchy to rethink design, reduce usage, reuse and repurposing of products before recycling or disposal, but to fully achieve this hierarchy, we encourage CalRecycle to expand and prioritize **Extended Producer Responsibility (EPR), reuse, and repair**, as a threefold strategy within the Zero Waste Plan. EPR is the most effective policy mechanism to fund and scale waste prevention and recovery. It ensures producers design for durability, recyclability, and repairability driving upstream solutions rather than relying on ratepayer funded disposal. Likewise, reuse and repair systems must be treated as foundational infrastructure, not subsidiary. Creating and investing in infrastructures around these strategies will strengthen material circulation and help ensure California's circular goals are achieved efficiently and equitably.
CPSC appreciates CalRecycle's continued partnership and looks forward to collaborating on next steps to ensure the Zero Waste Plan delivers on its promise for a circular California.
Sincerely,
Joanne Brasch, PhD, Director of Advocacy and Outreach

California Product Stewardship Council

Comment 12:

Name: Tedd Ward
Date Received: 10/17/25
Source: Email (**tedd@recycledelnorte.ca.gov**)
Attachment(s): No
Comment:
SUBJECT: Comments on DRAFT California's Zero Waste Plan
Dear CalRecycle Zero Waste Staff:

Thank you for this additional opportunity to provide feedback on the current draft of California's Zero Waste Plan. This letter is being submitted by the Global Recycling Council of the California Resource Recovery Association, a technical council that has focused on promoting Zero Waste plans and practices for over 25 years.

In a letter submitted in April, GRC recommended in this plan California use and recognize the only internationally peer-reviewed definition of Zero Waste. The definition used on page 6 instead is provided without context of any history or planning framework. With this current definition, outside of product stewardship programs, 'rethinking design to eliminate waste' is not a concern of the designer and no mechanism is proposed to make it so. Also 'reusing and repurposing what we have' would seem to include downcycling. Downcycling, or limited additional uses derived from degraded recovered materials, will not move towards Zero Waste or a circular economy as it can be seen as a slower, more complicated route to disposal. For example, the widespread use of single-use plastic film may create short-term opportunities for using such material in the production of plastic lumber products. In this simplistic example, support for the plastic-lumber-made-from-recycled -film industry becomes support for the more widespread use of film plastics, but would not necessarily be movement towards a circular economy. Downcycling is not circular and does not move towards circularity. Embracing such downcycling as 'zero waste' is neither accurate nor recommended, and will not move California towards a circular economy…but such strategies seem to be included in this definition.

While the identification of 'solution gaps' and low-value items, and high-value opportunities is welcome, the connection between the discussion of Zero Waste and the 'Circular Economy' depicted in Figure 2 is unclear. For instance, in Figure 2, who are the entities 'Redesigning for Circularity'? While an admirable ambition, outside of Producer Responsibility Organizations, who is to be engaged in that work and how are they to be paid? Without them, how will this vision of circularity work?

On page 7, this report might also consider 'discard management' or 'recovered materials management.' As this report does not discuss extraction, mining, logging or agricultural policies to any degree, it should be clear we are talking about discards. This would be a good place to note the how solution gaps and service gaps from page 6 and materials with low recovery values are fundamental challenges to this vision.

On page 8, Source Reduction is shown as a Key Performance Indicator. Measuring source reduction in association with reduced material usage mostly doesn't work, as many CalRecycle staff learned through the implementation of AB939. For most of these indicators, it is not clear who would be tracking what or reporting to who.

On page 15, it is unclear how CalRecycle would influence redesign, reduction , reuse or repurposing. While these are admirable goals, finding circumstances that meet both health and safety goals while reducing industrial expense may be most readily pursued. For many years, Minnesota had a technical advisory team MnTAP that helped industry reduce use of toxics, which might be a model for such efforts.

On page 16, perhaps a higher priority would be to curtail or prohibit the introduction of new products that pose an explosive or toxic hazard when such product or package is discarded. This would be compatible with the circular-first framework, and would help by re-affirming the safety and integrity of collection streams. Without some mechanism to enforce against the introduction of products that pose management challenges, managing discards will continue to be an ongoing challenge for reuse, recycling, composting and solid waste streams.

On page 18, the Zero Waste Plan could build on the idea that since illegal dumping and solid-waste related blight are common concerns that are most definitely not compatible with a zero waste future, actions to address these issues should be part of a Zero Waste Plan. In that regard, another potential pathway could be to have CalRecycle provide information, support and possible coordination and advice to Bureau

of Land Management, State Lands Commission, CalTrans & other State agencies and concerned land holders (e.g. AMTRACK) regarding cleanups, access control, monitoring and enforcement. To a limited extent, the volunteers of CalRecycle's Illegal Dumping Technical Advisory Committee provide this kind of platform.
CalRecycle could also serve as an informational and networking resource to help other State agencies adopt maintenance, reuse, repair, salvage systems to replace single use systems. This could include leasing and rentals in some cases.

On page 19, Item B3: This is not clear who is tracking or reporting material influx, or what that might include. Products that are not circular can be identified in the obvious cases: Introduction of single use products for which reusables are available, products that have a high likelihood of becoming or shedding microplastic litter, products made from materials that cannot be recovered, or products mislabeled in a way that caused problems for recovery, or the introduction of a new large-scale application for film plastics without a plan for capture and recovery. This plan does not describe any mechanism for identifying such products or how their introduction might be curtailed. Perhaps one place to start might be to have CalRecycle host a portal to receive complaints about such non-circular products.

On page 20, the case study describing software that facilitates more efficient food rescue illustrates a disconnect between vision and practicality. Food rescue is valuable, of course, but its value diminishes when sustainability is not built into the system. For instance, is there dependable funding to support the nonprofits expected to transport food quickly, safely, and in compliance with recordkeeping requirements? Tier 1 and Tier 2 food generators are incentivized to participate through tax rebates and reduced disposal costs. Yet, there is little discussion about funding the logistics and labor necessary to make these programs functional. Moreover, the plan overlooks the packaging associated with rescued food and the need to manage leftover or expired items through composting or other recovery methods. Without a dependable funding stream to hire and retain the workforce needed for these activities, this effort falls short of demonstrating true circularity.

Overall, in my opinion, this draft plan lacks practicality and clarity. There are significant gaps between the presented aspirations and the concrete steps needed to achieve them. The challenges and systemic obstacles are largely unnamed — for example, national economic policies that often run counter to these goals, deregulation trends favoring business interests, and the continued proliferation of single-use products designed for obsolescence. In such a context, where stores like Dollar Tree, and Dollar General continue to thrive on low-cost disposables, it may be time to consider politically challenging mechanisms such as a pollution or toxin tax to internalize environmental costs and better align incentives with sustainability objectives.

When reviewing financial mechanisms, rather than reviewing prices, State and perhaps national supports should be tracked (e.g. taxes and available deductions, subsidies, support programs) for extraction, production and import should be compared to similar supports for capture, reuse, repair, restoration, recovery, processing and refabrication. Who would report this to whom and how often is unclear, but such a comparison would enable comparative supports for production that might be retooled to support movement towards a circular economy.

CalRecycle can help foster circular outcomes by providing guidance to other agencies with partial responsibilities for allocating portions of the California Plastic Pollution Mitigation Fund. This guidance can be general to enable each agency to craft programs to meet their respective needs, but could facilitate the development of more coherent programs under SB 54. As many of these programs are to be targeting disadvantaged and rural communities, having more coherent, consistent programs will make them more accessible.

On page 43, CalRecycle can help further foster communication for cultural and behavioral change through partnerships with trade associations such as the California Resource Recovery Association, Solid Waste Association of North America.

Thanks for this opportunity to provide this feedback.

Sincerely,
Tedd Ward, Co-Chair
Global Recycling Council of the California Resource Recovery Association
Promoting Zero Waste, Ending Welfare for Wasting & Jobs from Design & Discards since 1999

Comment 13:

Name: Michael Siminitus
Date Received: 10/17/25

Source: Email (**Michael@wastebusters.info**)
Attachment(s): Yes
Comment:

Public Comment Summary

On behalf of Waste Busters, Inc., this submission provides formal comment on CalRecycle's Draft California Zero Waste Plan. The letter emphasizes (1) adoption of the internationally peer-reviewed Zero Waste definition, (2) clear implementation authority and measurable metrics, (3) dedicated funding through a single-use product tax, and (4) new alignment with Proposition 65 to establish fees on toxic products that fund clean, carbon-negative manufacturing innovation. These recommendations are designed to make California's Zero Waste framework more practical, equitable, and economically resilient.

Highlights

- Establishes a Reusable Systems Infrastructure Fund financed by single-use product surcharges.
- Recommends CalRecycle coordinate with OEHHA to impose Prop 65-based product fees, using proceeds to fund non-toxic, carbon-negative product innovation.
- Calls for a Zero Waste Technical Assistance Program modeled on MnTAP for industry guidance.
- Aligns data, reporting, and metrics with operational realities of SB 1383 and SB 54 implementation.
- Encourages formal partnerships with CRRA, SWANA, and local technical networks for public education and professional development.

Waste Busters, Inc.

Comments on the Draft California Zero Waste Plan

October 17, 2025
CalRecycle Zero Waste Planning Team
Department of Resources Recycling and Recovery
P.O. Box 4025
Sacramento, CA 95812
Subject: Comments on the Draft California Zero Waste Plan
Dear CalRecycle Zero Waste Staff,

Waste Busters, Inc. appreciates the opportunity to comment on the Draft California Zero Waste Plan. As a California-based zero waste consulting and facilitation firm, we specialize in implementing Refuse Separation Ordinance (RSO) compliance programs for Large Refuse Generators and in designing on-the-ground systems that transform state and local mandates into operational results. We strongly support CalRecycle's vision of a circular economy, but we respectfully submit the following comments to improve the clarity, practicality, and fiscal integrity of the Plan.

1. Adopt a Peer-Reviewed Definition of Zero Waste

We endorse the Global Recycling Council's (GRC) position that California's plan should adopt the internationally peer-reviewed Zero Waste International Alliance (ZWIA) definition. The definition currently used on page 6 lacks sufficient context and permits downcycling practices that slow the path to circularity. Recognizing only outcomes that genuinely preserve material value will ensure policy consistency across local jurisdictions and prevent recycled-content loopholes that perpetuate disposable systems.

2. Prioritize Design Accountability and Upstream Prevention

The draft's references to "redesign for circularity" (Figure 2) are commendable but under-specified. Waste Busters recommends CalRecycle link design accountability to Extended Producer Responsibility (EPR) metrics under SB 54, ensuring producers bear financial and material responsibility for recovery outcomes. Establishing a statewide Design-for-Circularity Advisory Council with representation from reuse operators, material scientists, and zero waste practitioners would provide needed guidance.

3. Clarify Implementation Authority and Enforcement Mechanisms

The Plan should delineate which agencies possess authority to influence redesign, reduction, and reuse outcomes. Models such as Minnesota's Technical Assistance Program (MnTAP) demonstrate that practical, industry-specific technical support can yield measurable reduction in waste and toxic use. A California-based Zero Waste Technical Assistance Program would operationalize the Plan's intent and support jurisdictions that lack internal capacity.

4. Establish a Dedicated Funding Stream for Reuse Infrastructure

A central barrier to circularity is the absence of stable, predictable funding for the reuse economy. Waste Busters urges CalRecycle to impose a statewide tax or surcharge on single-use disposable items, proportional to environmental impact and market volume. The resulting revenues should fund a Reusable Systems Infrastructure Fund supporting capital investment, workforce development, and incentives for

adoption of reuse and refill systems. This mechanism internalizes the environmental cost of disposability while advancing equity by creating stable, local employment.

5. Strengthen Metrics, Reporting, and Data Transparency

We concur with GRC's observation that Source Reduction indicators have historically proven unreliable. CalRecycle should instead adopt auditable, observable performance metrics such as tons avoided through reuse and refill systems, number of verified Zero Waste Facilitator programs, and contamination-rate improvements documented through standardized Waste Characterization Studies (WCS).

6. Align with Proposition 65 and Create Incentives for Non-Toxic, Carbon-Negative Products

California already leads the nation in chemical disclosure through Proposition 65. Waste Busters recommends that CalRecycle collaborate with the Office of Environmental Health Hazard Assessment (OEHHA) to establish fees or surcharges on products requiring Prop 65 warnings, reflecting their environmental and public-health risk. Revenues from these fees should be directed to a Clean Product Innovation Fund that:

1. Provides grants or tax incentives for manufacturers adopting non-toxic materials or carbon-negative production methods; and
2. Supports small businesses and local manufacturers transitioning to safer and more circular alternatives.

This approach would strengthen market signals discouraging toxic product design while rewarding innovation aligned with California's zero waste and climate goals.

7. Integrate Anti-Disposability and Anti-Pollution Mechanisms

We support GRC's call to curtail or prohibit introduction of products that create hazards or are fundamentally non-recoverable. In tandem, CalRecycle should assess the feasibility of a pollution or toxin tax that discourages hazardous product design and funds remediation or circular alternatives.

8. Foster Coordination and Communication

CalRecycle's leadership role is critical in convening cross-agency collaboration. We encourage formal partnerships with trade and professional organizations such as CRRA and SWANA, which can expand public education and technical training to advance behavioral and cultural change.

Conclusion

California's leadership in waste reduction depends on bridging the gap between aspiration and execution. A Zero Waste Plan that defines Zero Waste with rigor, establishes enforceable design accountability, and funds reuse infrastructure through targeted fees on single-use and toxic products will yield measurable progress toward a resilient circular economy. Waste Busters stands ready to assist CalRecycle and partner jurisdictions in implementing these practical strategies statewide.

Resourcefully submitted,

Michael Siminitus
President, Waste Busters, Inc.
Michael@wastebusters.info
www.wastebusters.info

Comment 14:

Name: Charles Rea
Date Received: 10/17/25
Source: Email (**crea@calcima.org**)
Attachment(s): Yes
Comment:
To CalRecycle:

We commend CalRecycle for its draft Zero Waste Plan. This effort can provide a needed boost for recycling efforts, and potentially achieve a true zero waste, or circular economy.

CalCIMA. The California Construction and Industrial Materials Association is a trade association for producers of aggregates, asphalt, and concrete. The member companies operate over 500 material production and recycling facilities throughout California. CalCIMA and its members have long advocated for policies to increase recycling of concrete, asphalt, and aggregates.

Recycling Opportunities. Recycling of concrete and asphalt conserves natural resources of construction aggregates, oil, water, and limestone, and reduces greenhouse gases by reusing oil, cement, and aggregates, and reducing truck trips. Since there are reports that as much as 1 million tons of these materials still go to California landfills, there is much more that needs to be done to increase recycling of construction materials.

Recommendations. We recommend that the recycling of asphalt, concrete, and aggregate materials be considered for several parts of the Plan:

- Recommendation B re existing policies, programs, regulations, and statutes for best use
- Recommendation G reestablishing innovation roadmaps, circular solution successes, consolidating key research, and facilitating coordination among parties.
- Recommendation I re tailored communication for target audiences
- Recommendation J re consolidating local and statewide resources, and providing training and resources for local jurisdictions
- Recommendation K re several areas of monitoring, particularly integrating existing data cross-agencies and with local jurisdictions.
- Recommendation N re engaging rural and environmentally burdened communities
- Recommendation O re partnerships with state and local entities to advance recycling

These are the general areas of state and local policy where the Plan should include emphasis:

State. There are on-going efforts at Caltrans to continue to develop specifications to increase the use of recycled materials. These include increasing the use of reclaimed asphalt pavement (RAP) and use of RAP in rubberized hot mix asphalt. It includes on-going efforts to expand recycled materials in concrete mixes. And, there are provisions in the CalGreen Building Code's voluntary measures to allow the use of recycled materials in concrete.

In addition to the specific efforts at Caltrans, Caltrans has undertaken the process for both asphalt and concrete mixes to transition from prescriptive to performance-based specifications. This will be a fundamental change that, instead of identifying exact amounts of materials in a mix, specifications will be based on outcomes. This change will allow achievement of quality outcomes through better proportioning of materials and opportunity to take advantage of recycled materials. For asphalt, this is being done through Balanced Mix Design. For concrete, it is through the Concrete Performance and Sustainability Specifications RoadMap. Both initiatives are targeted for completion in the 2030-31 timeframe.

Local. An important element of the Zero Waste Plan will be to advance use of recycled materials in local public works. While some jurisdictions have made significant strides in the use of recycled materials, there remain far too many that either are not allowing use of recycled materials or limiting it to minimal levels.

As examples, Caltrans specifications allow the use of 100% recycled asphalt and concrete in road base, but some local public works departments don't allow any. Also, Caltrans allows up to 25% reclaimed asphalt pavement (RAP) in roads, but many local public works departments limit to 15% or none at all. This is a significant area in which opportunity is currently being lost to recycle. Not even achieving the relatively conservative Caltrans level for recycled materials means significant opportunity to achieve zero waste is being lost at the local level.

Several times the State Legislature and Governor have endorsed increased recycling of asphalt and concrete by local jurisdictions. AB 2355 in 2015, AB 2953 in 2022, and most recently AB 978 (Hoover) require local jurisdictions to have specifications for use of recycled asphalt, concrete, and road base materials at least equal to Caltrans. It will be important that these changes are implemented in timely manner to achieve the Zero Waste Plan.

In sum, we urge that state and local agency construction material recycling initiatives and implementation be an essential element of the Zero Waste Plan.

We would be happy to assist in discussing specific proposals in regard to recycled materials, specifications, and codes, and attach background on key issues.

Sincerely,

Charles L Rea
Vice President, Policy & Communications

Increasing Recycling of Asphalt and Concrete Materials

Recycled Materials for Road Base. Using crushed concrete and asphalt rubble as an aggregate in road base is a common way to recycle concrete and asphalt. Caltrans allows up to 100% recycled concrete and asphalt for road base.

Reclaimed Asphalt Pavement (RAP) in Asphalt Pavements. Increasing the use of RAP is a

particularly important area of recycling, since it not only conserves aggregates but also oil, which is used as a binder for the aggregates in asphalt. Caltrans allows 25% RAP and is working to increase it to 40%, a level common around the country.
Local Governments. Despite Caltrans allowing 25% RAP and 100% recycled road base, many California local governments prohibit use of RAP and recycled road base, or at lower amounts than Caltrans' level. In the case of RAP, this is particularly important since most local roads are made of asphalt. Focus on increasing the use of RAP and other recycled materials in pavements has been supported in successive bills by the Legislature and Governor (AB 2355 in 2014; AB 2953 in 2022, and AB 978 in 2025). This has resulted in some progress, but there are still many cities and counties that continue to prohibit or limit use of recycled materials.
Recycled Concrete as a Product. Since 2005, Public Resources Code sections 16000-16004 state that concrete made of recycled materials is an acceptable product in accordance with identified specifications and codes.
CALGreen Building Code. Voluntary provisions in CALGreen include numerous options to incorporate the use of recycled materials, particularly in concrete.
Returned Plastic Concrete. Caltrans allows up to 15% returned plastic concrete (RPG) in concrete mixes for certain applications. Returned Plastic Concrete is concrete that remains in a truck in a fresh or moist state and can be remixed into a new batch of concrete. Use of RPG provides for maximum recycling of concrete, since it reuses cement, aggregates, and water, and the carbon footprint by 15.3% per mix. There are now national codes that allow up to 50% RPG.
Recycled Hardened Concrete. While hardened concrete can be crushed and used as an aggregate in road base and in minor concrete, there is opportunity to also use it in pavements and structures. There is substantial research from the Federal Highway Administration, National Concrete Pavement Technology Center and the National Ready Mixed Concrete Association, as well as testing results from California producers.

Comment 15:

Name: Tristan Daedalus
Date Received: 10/17/25
Source: Email (**TDaedalus@bakercommodities.com**)
Attachment(s): Yes
Comment:
In response to CalRecycle's third Zero Waste Plan workshop on October 1, 2025, Baker Commodities respectfully submits the following comments for the Department's consideration in preparing amendments to this framework.
We appreciate CalRecycle's work on developing the draft Zero Waste Plan, which advances our state's goals in creating a circular economy. However, we are concerned that the current draft fails to recognize the important contributions of agricultural rendering in the existing, operational infrastructure that already diverts large quantities of organic wastes from landfills and provides substantial climate benefits.
This omission is particularly noteworthy given that:

- Rendering is carbon-negative and sequesters five times more carbon and short-lived climate pollutants than it produces.
- Rendering already processes 50% of all food animals (inedible portions), preventing landfill disposal.
- Renderers keep fats, oils, and greases (FOG) out of wastewater systems, preventing infrastructure damage and water pollution, by recovering and recycling used cooking oil.
- UCO recycling provides superior biofuel feedstock compared to virgin agricultural oils.
- Existing rendering infrastructure has operated throughout California for over 100 years, representing established circular economy success.

We understand that the California Department of Food and Agriculture (CDFA) maintains exclusive regulatory oversight authority over renderers in statute; however, we propose several ideas herein that would recognize, support, and integrate these proven and operational technologies already supporting the circular economy into the Plan, and request that CalRecycle include them in future versions.

Main Comments

1. Rendering is omitted from the Materials Management Hierarchy examples in the draft plan
Issue: Several Materials Management Hierarchy (MMH) examples highlight composting and anaerobic digestion for organics, while omitting rendering. However, rendering is a well-established recovery pathway

that transforms otherwise wasted materials into high-quality, high-value products other than soil amendments.
Suggested Change: Add rendering and UCO recycling as examples under the "Recycle" and "Repurpose" tiers to reflect their role in transforming organic waste into feed, fertilizers, and biofuels.
Rationale: The high-pressure, high-temperature rendering process is chemically different than either unmanaged decomposition or managed decomposition (in composting or anaerobic digestion)
2. "Hard to Recycle Materials" Section Overlooks Major Organic Waste Streams
Issue: The Zero Waste and Circular Economy Together (Page 6) section identifies materials with "limited value as a resource" and "service gaps" but fails to mention inedible animal by-products (approximately 50% of food animals processed) and used cooking oil—both of which already have established circular solutions through rendering.
Suggested Change: Include inedible animal by-products and UCO as material streams with existing rendering infrastructure in the circular economy section.
Rationale: These material streams represent millions of tons annually. While rendering already manages them effectively, the Plan's silence on these materials creates the risk that future policies might inadvertently undermine existing circular infrastructure or fail to optimize it.
3. Climate Benefits are Understated by Omitting Carbon-Negative Processes
Issue: Pages 7-8 discuss economic value and climate goals, emphasizing that "45% of climate-heating emissions come from how we make products." However, the Plan fails to identify rendering as an *existing* carbon-negative industrial process operating in California.
Proposed KPI revision: Revise the GHG emissions metric to explicitly account for carbon-negative processes, not just emissions reductions. Current language measures "decrease in greenhouse gas emissions" but doesn't capture net-negative outcomes. Suggested language: *"Measured decrease or net sequestration of greenhouse gas emissions associated with materials management activities, including carbon-negative processes."*
Rationale: Rendering's carbon sequestration capability directly supports California's climate goals. The only emissions from rendering come from combustion of heating fuel—the actual rendering process sequesters carbon. This 5x carbon-negative performance substantially outperforms other waste stream pathways for organics recovery.
4. Policy Recommendations Miss Existing Organic Processing Infrastructure
Issue: Policy Recommendations A and B (pages 15-19) discuss developing circular frameworks and reviewing existing policies but don't address how rendering and UCO recycling fit into California's materials management framework.
Suggested Change: Incorporate rendering and UCO recycling into policy frameworks as priority organic waste management pathways.
Rationale: Without explicit recognition in policy frameworks, rendering risks being overlooked in future regulatory development, potentially leading to policies that inadvertently favor less climate-beneficial alternatives or fail to optimize existing circular systems.
5. Financial Mechanisms Don't Prioritize Recycling Methods based on Carbon Performance
Issue: Recommendations C and D (pages 21-24) discuss aligning market signals with circular behavior and establishing funding, but don't differentiate between organic processing methods based on climate performance.
Suggested Change: Prioritize incentives based on carbon sequestration capabilities to incentivize carbon-negative processes, like rendering, and support UCO collection infrastructure that minimizes FOG infiltration into municipal sanitary sewer networks.
Rationale: California's pricing and incentive structures should reflect the Materials Management Hierarchy's goal of "highest and best use" and climate performance. As such, carbon-negative processes, like rendering, should receive greater support than carbon-positive alternatives for comparable waste streams.
6. Infrastructure Recommendations Overlook Existing, Surplus Rendering Capacity
Issue: Recommendations E and F (pages 26-33) extensively discuss building new infrastructure and optimizing existing facilities but never mention rendering plants as existing circular infrastructure with potential excess capacity.
Suggested Change: Assess and optimize rendering facility capacity for organic waste diversion before investing in new infrastructure for the same waste streams.
Rationale: California already has operational rendering infrastructure throughout the state. Before investing in new organics management facilities, the Plan should evaluate opportunities to optimize the usage of

existing rendering capacity. This represents efficient use of established infrastructure and avoids redundant capital expenditure and carbon emission generation to recycle the same materials.

7. Research and Innovation Section Ignores Proven Carbon-Negative Rendering Technology

Issue: Recommendations G and H (pages 34-41) focus on emerging innovations and university research but don't highlight rendering as an established industrial-scale circular technology that could inform future innovations.

Suggested Change: Invest in studying rendering's carbon sequestration benefits and material circularity cycle for broader application.

Rationale: Rendering represents a mature circular technology operating at commercial scale for over a century. Rather than only focusing on emerging innovations, the Plan should also study and replicate the success factors of proven systems, like rendering, that already achieve carbon-negative performance.

8. Communication Strategies Overlook Commercial Organic Waste Management

Issue: Recommendations I and J (pages 42-47) focus heavily on consumer recycling behavior and residential organics composting of post-consumer organic wastes, but underemphasize commercial/institutional organic waste streams like UCO and pre-consumer wastes like animal by-products.

Suggested Change: Develop campaigns to educate businesses on UCO/FOG recovery and rendering's circular benefits.

Rationale: While residential organics composting is important, commercial food service operations generate massive quantities of UCO and FOG. Educational campaigns should address proper management of these materials and highlight the circular economy benefits of rendering.

9. Discussion on SB 1383 Fails to Recognize Rendering's Important Role in Organic Waste Diversion

Issue: The draft makes frequent mention of SB 1383's organics diversion success but doesn't acknowledge rendering as an existing organic waste diversion pathway eligible under the law.

Suggested Change: Explicitly include rendering's role in diverting inedible by-products and supporting SB 1383 goals.

Rationale: SB 1383 aims to divert organics from landfills to reduce methane emissions. Rendering accomplishes this goal while also sequestering carbon—providing greater climate benefit. The Plan should recognize rendering as part of California's organic waste diversion strategy rather than treating composting/digestion as the only options.

10. Food Recovery Hierarchy Lacks Clear Positioning for Inedible Materials

Issue: The Plan extensively covers edible food recovery (Copia case study, policy discussions) but provides no framework for managing the 50% of food animals that are inedible after harvest.

Suggested Change: Align guidance with CDFA's "Food Recovery Hierarchy" and clarify that rendering is the organics recycling process best able to recover high-value commodities from inedible materials.

Rationale: The current emphasis on edible food recovery is appropriate, but the Plan creates a false impression that composting is the primary option for inedible organic materials. Rendering operates higher on the MMH for applicable materials and deserves explicit recognition.

11. Wastewater and FOG Management Entirely Absent

Issue: While wastewater treatment facilities are mentioned in infrastructure discussions (page 28), there is zero mention of FOG management, prevention, or diversion—despite FOG being a major wastewater system challenge.

Suggested Change: Explicitly **a**ddress FOG collection and UCO recycling to reduce wastewater issues and support biofuels feedstocks from recovered fats, oils, and greases.

Rationale: FOG disposal down drains causes massive infrastructure damage and water pollution. UCO recycling and rendering solve this problem while creating valuable products. This represents a significant circular economy opportunity that the Plan completely overlooks.

12. Cross-Agency Collaboration Doesn't Include Relevant Agencies

Issue: Page 63 (Recommendation O, Pathway O3) discusses cross-agency collaboration and mentions DTSC but doesn't identify water quality, agriculture, or food safety agencies—all of which are critical to rendering and UCO systems.

Suggested Change: Include coordination with water, agriculture, and food safety agencies for rendering optimization.

Rationale: Rendering sits at the intersection of waste management, agriculture, water quality, and food safety. Effective optimization requires cross-agency coordination that the Plan currently doesn't address.

13. Biofuel Feedstock Hierarchy Not Discussed

Issue: The Plan discusses circular economy principles but never addresses the hierarchy of biofuel feedstocks—despite UCO boasting a far lower carbon intensity score when compared to virgin agricultural oils (soy, corn, canola).
Suggested Change: Recognize UCO's role in low-carbon fuel standards and its environmental benefits.
Rationale: The Zero Waste Plan should support California's Low-Carbon Fuel Standard and biofuel policies, including the recent revisions that favor recovered UCO, as opposed to virgin oils, as a feedstock for advanced biofuels. The Plan should explicitly recognize UCO as a priority feedstock that supports both waste diversion and energy transition goals.

14. Partnership Opportunities with the Rendering Sector Overlooked
Issue: Recommendation O (pages 60-63) discusses public-private partnerships but doesn't identify the rendering industry as a potential partner.
Suggested Change: Establish partnerships with rendering facilities to optimize organic waste diversion.
Rationale: The rendering industry has established infrastructure, logistics expertise, and processing capacity. Public-sector partnerships could optimize this existing circular system rather than building redundant infrastructure.

Minor Technical Corrections

1. Suggested Glossary Additions (Pages 69-72)
• **Rendering:** High-temperature, high-pressure process used to chemically transform animal by-products and fats, oils, and greases into feed ingredients, fertilizers, and oleochemical and biofuel feedstocks, that sequesters carbon through chemical transformation rather than decomposition.
• **Used Cooking Oil (UCO):** Post-consumer fats and oils from food preparation that can be collected and processed into biofuel feedstock and other renewable products.
• **Fats, Oils, and Greases (FOG):** Category of organic materials from food preparation that require specialized management to prevent wastewater system contamination and can be recovered as valuable feedstock for rendering and biofuel production.

2. Suggestions Abbreviations List Additions (Pages 73-74)
• **FOG:** Fats, Oils, and Greases
• **UCO:** Used Cooking Oil

3. Key Performance Indicators Language (Page 8)
Several KPIs use language that may not adequately capture rendering's environmental and economic contributions.
Suggested Revisions:

- **Source Reduction KPI:** Clarify that "preventing material usage" includes efficient recovery of all usable components from food animals, leaving minimal waste.
- **Recycling Rate KPI:** Ensure "processed into new material inputs for production" explicitly includes rendering's transformation of organics into feed, fertilizer, and oleochemical inputs.
- **Environmental Impact KPI:** Revise to "Measured decrease or net sequestration of greenhouse gas emissions" (adding "or net sequestration").

Conclusion
We applaud the Department's work to further build California's circular economy and we believe the Zero Waste Plan presents an ambitious and important framework to achieve these ends. However, we feel that the complete omission of rendering and used cooking oil recycling undermines the proposal's current regulatory depth as well as its potential future effectiveness.
Agricultural rendering is an established, operational, and industrial-scale system that boasts widespread adoption with centuries of success. In its current iteration, the Zero Waste Plan discounts these commercial successes in favor of alternative organics management pathways, giving the impression that these alternatives are the only, or should be the primary, method of such disposal. However, in many instances, the rendering process is fundamentally superior in advancing circular economic principles, producing high-value finished products that are utilized throughout the economy, as well as critical inputs that often replace virgin or petroleum-based oils.
Together with our partners in the rendering industry and the team at the North American Renderers Association (NARA), Baker Commodities stands ready to assist the Department with this important work, and we encourage the Department's final Plan to reflect the critical contributions rendering makes to the circular economy in our state and our nation.

About Baker Commodities

Baker Commodities is a three-generation family-owned and operated recycling business, trusted as one of the nation's leading providers of rendering and grease management services since 1937. We take our commitment to the environment seriously and provide critical services to support farmers and dairymen, minimize the environmental impact of the agricultural and food production supply chains, and assist restaurants and municipalities alike by transforming destructive waste into high-quality finished products.
We are proud of our work to contribute to the circular economy. Every day, our facilities across the country convert food-grade meat products considered inedible to American consumers, as well as other by-products from meat processing, into valuable commercial commodities, including high-protein animal and pet food ingredients, and tallow, a critical base component for soaps, paints, cosmetics, lubricants, and more. Our facilities also convert used cooking oil into a key feedstock for the advanced biofuels that are serving as drop-in replacements for traditional petroleum-based products and helping to reduce carbon emissions across the transportation sector.
Baker is dedicated to saving the environment by ensuring we use sustainable methods to support the industries we serve. Not only do our finished products address important social needs using materials that would otherwise be wasted, but they often serve as a replacement for traditional, petroleum-based inputs. We're also proud to report that the rendering process produces these benefits while sequestering a whopping five times more carbon than it emits.
Respectfully submitted,
Tristan Daedalus
Director of Legislative and Regulatory Affairs
Baker Commodities

Comment 16:

Name: Julia Levin
Date Received: 10/17/25
Source: Email (**jlevin@bioenergyca.org**)
Attachment(s): Yes
Comment:
Dear CalRecycle:
I am writing on behalf of the Bioenergy Association of California to comment on the Draft Zero Waste Plan. BAC supports the goal of zero waste, but is concerned that the Draft Plan provides very little detail about organic waste and no specific recommendations to accelerate organic waste diversion. Since California is far behind in meeting the waste diversion requirement of SB 1383, BAC urges CalRecycle to add much more focus and specific action items to achieve those requirements.
BAC represents almost 100 members that are converting organic waste to energy to meet the state's clean energy, climate change, wildfire reduction, landfill reduction, and circular economy goals. BAC's public sector members include cities and counties, Tribes, air quality and environmental agencies, waste and wastewater agencies, public research institutions, environmental and community groups, and a publicly owned utility. BAC's private sector members include energy and technology companies, waste haulers, agriculture and food processing companies, investors and consulting firms, and an investor-owned utility. BAC's comments on the Draft Zero Waste Plan are below.
1. Support Moving from "Waste" to "Materials" to Build a Circular Economy
BAC strongly supports the Draft Plan's proposal to shift from a "waste" focus to a "materials" focus. This makes sense since most waste can be converted into beneficial products and that conversion reduces landfill disposal and other impacts. Shifting to a resource or materials focus is also consistent with building a circular economy where little to nothing is treated as true waste that cannot be repurposed.
Building a circular economy provides many benefits, including the reduction of landfill waste, conservation of energy and raw materials, creation of good jobs and economic development, and more. The economic and environmental benefits of a circular economy are substantial and highlighted in the Governor's California Jobs First initiative and the thirteen regional plans developed as part of that initiative.[1]
Converting organic waste to energy and fuels is an important part of the circular economy that should be emphasized much more in the Zero Waste plan. According to the Clean Air Task Force, projects that convert organic waste to bioenergy or hydrogen create more jobs and a higher proportion of good paying and permanent jobs than other energy sectors.[2] These family-friendly jobs provide lasting economic development and investment in the communities where bioenergy projects are located.
BAC supports the recommendations on pages 27-29 to accelerate the circular economy, especially the recommendation to use existing capacity where possible, such as wastewater treatment facilities that have

excess digester capacity.[3] This should be a top priority to accelerate organic waste diversion as cost-effectively as possible.

BAC also supports the recommendation to streamline permitting for circular economy projects,[4] but this recommendation should include permit consolidation as well as streamlining. Permit consolidation means that when multiple agencies are involved, they can work simultaneously instead of consecutively, which could save years on some projects. Permit streamlining and consolidation must also go beyond CEQA to include air districts and other agencies. On one diverted organic waste project in development, the CEQA permit was issued in just over one year, but the air permit has taken 3.5 years. Acceleration of circular economy projects will require addressing each of these through permit consolidation and streamlining that involves all relevant permitting agencies.

2. Need to Increase Focus on Climate Change and Organic Waste Diversion

BAC is very concerned about the lack of emphasis on climate change in the Draft Plan. This is underscored in the problem statement on page four, which does not even mention climate as one of the impacts of California's waste. The Draft Plan is also very light on recommendations to accelerate progress in meeting the requirements of SB1383 to divert 75 percent of California's organic landfill waste by the end of this year. As the Draft Plan notes, California has diverted only 7.5 percent of organics so far,[5] only ten percent of what is required by state law. Given that the State is so far behind in meeting this goal, it is surprising to see so little emphasis on organic waste diversion in the Draft Plan.

BAC is especially concerned at the omission of any mention of cellulosic or woody waste in the Draft Plan. Cellulosic waste comprises a significant proportion of organic waste and of landfill waste generally. According to Lawrence Livermore National Lab's assessment in *Getting to Neutral*, cellulosic waste makes up more than three-quarters (by volume) of all organic landfill waste in California[6] and yet the Draft Plan does not mention it or make any recommendations to accelerate its diversion. For example, the Draft Plan mentions source reduction, recycling and compost as ways to accelerate landfill diversion,[7] but none of these is a solution for most of California's cellulosic (non-digestible) waste.

BAC urges CalRecycle to include far more emphasis on organics diversion, which is required by state law and one of the most urgent and cost-effective climate solutions. This includes recommendations for both digestible and non-digestible organics. Compost is not the only solution for organic waste and is not a solution at all for woody waste. California cannot achieve zero waste or – more importantly – the statutory requirement to divert 75 percent organic landfill waste without addressing cellulosic or woody waste currently going to landfills.

BAC urges CalRecycle to include all organic waste conversion technologies in the Zero Waste Plan, not just composting. That should include anaerobic digestion as well as non-combustion thermal conversion.

3. Need to Revise Policies and Regulations for Highest and Best Use

BAC supports Policy Recommendation B to "Review and refine existing policies, programs, regulations, and statutes for highest and best use based on Materials Management Hierarchy."[8] This review of existing policies and statutes is long overdue as many of the definitions and requirements in the waste code are out of date, politically motivated, and/or contrary to science. In particular, BAC urges CalRecycle to review sections of code related to "transformation," "gasification," and "biomass conversion." These sections are, at best, extremely confusing and are slowing the development of projects that can convert waste biomass to beneficial products, which is one of the goals of the Draft Plan.

BAC also supports the adoption of a Materials Management Hierarchy, provided that it is science-based and prioritizes the state's highest priorities as established by state law. That means prioritizing greenhouse gas (SB 32) and Short-Lived Climate Pollutant (SB 1383) reductions, as well as projects that can provide carbon negative emissions to achieve carbon neutrality (AB 1279). The Materials Management Hierarchy should also be based on best available science and objective, performance-based standards like lifecycle carbon intensity, permanent jobs created and community economic benefits, and lifecycle benefits for air quality.

BAC also urges CalRecycle to update its policies, funding priorities and related programs to be based on the same objective, performance-based criteria as a Materials Management Hierarchy. This is especially important regarding climate impacts and benefits. For example, CalRecycle has not prioritized climate funding for the diverted organic waste projects that provide the greatest climate benefits. The science is clear that projects that produce both energy and organic soil amendments (compost or biochar) are more beneficial for the climate than projects that just do one or the other.[9] A literature review conducted for Oregon's Department of Environmental Quality found that projects that produce both bioenergy and compost provide 3.5 times the carbon reductions that compost alone provides.[10] This has been well

documented for more than a decade across dozens of studies,[11] yet CalRecycle has not prioritized or incentivized projects that provide the greatest climate benefits by producing both energy and soil amendments. For organic waste, any Materials Management Hierarchy must consider full lifecycle emissions and not treat all diverted organic waste projects the same by focusing solely on avoided landfill emissions.

4. The Draft Plan Omits Bioenergy, Even in the Energy Transition Section

BAC is very concerned that the Draft Plan barely mentions energy and does not mention bioenergy in any of the actual recommendations. By contrast, the Draft Plan mentions compost and composting 26 times. Even when the Draft Plan refers to the energy transition, it only mentions wind, solar and batteries, but not bioenergy.[12] This makes no sense in a plan that is intended, in part, to build a circular economy. Solar, wind and batteries are not part of a circular economy, but bioenergy is. And bioenergy can be generated from organic waste that is diverted from landfills as well as landfill and wastewater biogas. The Draft Plan only mentions energy in the definitions sections and the case studies, but does not make any recommendations related to bioenergy.

This is a huge missed opportunity that should be corrected in the final Zero Waste Plan. As noted above, anaerobic digestion plus composting the digestate can provide far greater carbon reductions than compost alone. Bioenergy plus compost or biochar production, or bioenergy combined with carbon capture and sequestration, can also generate carbon negative emissions. In addition, permitting of new compost facilities is challenging in some air districts and may no longer be possible due to restrictions on methane and other VOC emissions.

Bioenergy is also the most valuable use of woody waste, especially since California has so much forest and agricultural waste in addition to urban wood waste. Wood chips is a far less valuable product that provides fewer economic, sustainability and climate benefits.

The Zero Waste Plan should include recommendations related to bioenergy and should not limit solutions for digestible waste to compost only.

5. Importance of Research to Guide Policy and Public Education.

BAC supports the Draft Plan's emphasis on research, but research is only valuable if it is in fact used to shape policy. BAC urges CalRecycle to prioritize applied research that provides the basis for a Materials Management Hierarchy and other policies and incentives. Research is needed to inform climate and sustainability policies, but the research is only beneficial if it is applied to the policies and incentives that CalRecycle adopts to further California's climate, waste reduction, and other goals.

Thank you for your consideration of these comments on the Draft Zero Waste Plan.

Sincerely,
Julia A. Levin
Executive Director

Footnotes

[1] **https://jobsfirst.ca.gov/regions/**.
[2] Clean Air Task Force: *An Exploration of Options and Opportunities for the San Joaquin Valley Clean Energy Future,* issued in November 2024.
[3] Draft Zero Waste Plan, Circularity Recommendation E4, page 28.
[4] Circularity Recommendation E1, page 27.
[5] Draft Plan at page 10.
[6] Lawrence Livermore National Lab, *Getting to Neutral – Options for Neutral Carbon Emissions in California*, January 2020. LLNL-PRES-795982.
[7] Draft Plan at page 7
[8] Draft Plan at page
[9] Morris et al, *Evaluation of Climate, Energy, Soils Impacts of Selected Food Discards Management Systems*, prepared for the State of Oregon Department of Environmental Quality, October 2014.
[10] Id at pages ii-iii.
[11] The State of Oregon DEQ study, referenced above, was based on a literature review of 147 separate studies conducted over 15 years. Id at page 3.
[12] Draft Plan at pages 6 and 70.

Comment 17:

Name: Maile Lono-Batura / Sarah A. Deslauriers
Date Received: 10/17/25

Source: Email (**sdeslauriers@casaweb.org**)
Attachment(s): Yes
Comment:
The California Association of Sanitation Agencies (CASA) appreciates the opportunity to provide comments on the Draft Zero Waste Plan (Plan) proposed by CalRecycle. CASA is an association of California wastewater municipalities, often referred to as Water Resource Recovery Facilities (WRRFs), engaged in advancing the recycling of wastewater into potable water and the recovery and beneficial use of renewable energy, biosolids, fuel, and other valuable resources. Through these efforts, we help create a clean and sustainable environment for Californians.
Our members represent more than 90% of the sewered population, including more than 135 local public agencies focused on helping to achieve the State's zero waste and climate change mitigation mandates and goals to:
– Reduce short-lived climate pollutant (SLCP) emissions by accepting and co-digesting diverted organic (food) waste from landfills under SB 1383
– Reduce carbon intensity of transportation fuel by using the biogas we generate
– Provide 100 percent of the State's energy needs from clean and renewable sources
– Increase soil carbon/carbon sequestration by land-applying biosolids and supporting the Healthy Soils Initiative, Climate Smart Strategy, and Wildfire & Forest Resilience Action Plan
CASA is submitting this follow-up comment letter to supplement our comments from **April 9, 2025**. As noted in that letter, water resource recovery represents a significant segment of renewable resources available to California. In addition, water resource recovery generates clean water and offers a non-fossil carbon source for renewable energy. The collective act of regenerating resources from treatment facilities demonstrates that realizing a circular economy is possible, given systemic support through regulation, programs, certifications, and platforms. By integrating these systems across locally available, value-added resources, we can move closer to circular economy goals in line with the State's Zero Waste Plan.
One of the most effective methods of recovering resources from wastewater is land application of biosolids. **California leads the nation in biosolids production**, producing a total of 736,000 dry metric tons in 2023.
From a circular resource perspective, California's wastewater sector has a strong presence, leading in:
• **Biogas capacity potential**: The American Biogas Council ranked California #1 out of 50 states in biogas production potential of 502.6 billion H3/yr.[1]
• **Food waste processing:** The U.S. Environmental Protection Agency found that, California has the greatest number of operating digesters (20) that accept food waste, followed by Pennsylvania (8), Massachusetts (7), New York (7), and Wisconsin (6) round out the top five. All other states have four or fewer digesters.[2]
• **Phosphorus recovery**: In a baseline report, it was estimated that the amount of phosphorus beneficially recovered through effluent irrigation in the U.S. is 5,000 metric tons per year. This value corresponds to about 1.6% of the total mass of phosphorus entering wastewater facilities in the U.S. (319,000 metric tons per year).[3]
California is a close second to Florida in water reuse as well. This notable presence (and potential) the wastewater sector represents in the circular resource recovery space provides an immediate platform for CalRecycle's Zero Waste Plan.
The Draft Zero Waste Plan presents a comprehensive and systemic approach aligning efforts and interests across the State. CASA commends CalRecycle for its efforts to synthesize the comments collected in spring 2025.
Please find the following comments and recommendations listed by Focus Area with the aim to further bolster your strategic efforts.
Policy & Regulation
• Pathway A2. CASA strongly supports "elevating circular economy as a key avenue for meeting California's environmental, economic, health, and equity goals". As regulatory agencies impose more stringent requirements for air quality, water quality, solid waste management, energy/fuel production and consumption, etc., and regulated entities are reaching the limits of technology, the regulators and regulated entities need a framework within which to prioritize objectives – balancing resilience with sustainability while addressing compliance.
• Pathway B1. Resource Management Organizations (like CASA) should be added to key parties for implementation, as these organizations have direct access to materials management programs.
• Pathway B2. Include regenerative resources as key high-volume materials identified.

Financial Mechanisms
• Pathway C2. CASA supports holding listening sessions to highlight the challenges with expanding circular infrastructure and services, identifying where existing regulations may be inadvertently limiting implementation and advancement.
• Pathway D1. Consider examples like Energy Trust of Oregon[4] as a model for legislatively directed funding that prompted renewable energy projects across the water resource recovery sector.
Infrastructure for Circularity
• Pathway E2: Resource Management Organizations should be added to key parties for implementation, as these organizations have direct access to materials management programs.
• Pathway E4: CASA appreciates the direct mention of wastewater or water resource recovery facilities. Consider spotlighting Industrial Symbiosis opportunities like those demonstrated in Kalundborg[5] (Denmark), a global example where partnerships were leveraged to expand the capacity of circular infrastructure.
• Pathway F3: Including Resource Management Organizations in this high-volume outflow that would benefit from matchmaking platforms.
Research & Innovation
• Pathway G4 & H1-H3: Resource Management Organizations should be added to key parties for implementation, as these organizations have direct access to materials management programs and are also researching streamlined certification platforms.
Communication for Cultural & Behavior Change
• Pathway (ALL): Collaborate with Resource Management Organizations like CASA, as adjacent initiatives are also being discussed.
Data & Monitoring
• Pathway K1: Resource Management Organizations should be added to key parties to integrate existing databases.
We request that CalRecycle recognize the potential of the circular water resources recovered from Water Resource Recovery Facilities (WRRFs) as an integral component of the Zero Waste Plan.
WRRFs offer a wide-reaching opportunity to align efforts in moving towards zero waste, establishing value for circular resources, and serving as a national model in achieving a circular model here in California. Thank you for this opportunity to review and comment on the Draft Zero Waste Plan. Please contact us if you have any questions at (916) 432-3551 or via email at **mlonobatura@casaweb.org** or **sdeslauriers@casasweb.org**.
Sincerely,
Maile Lono-Batura
Director of Renewable Resource Programs
Sarah A. Deslauriers, P.E., ENV SP
Director of Air, Climate, & Energy Programs
Cc: Mr. Adam Link, Executive Director, CASA

Footnotes
[1] American Biogas Council. **https://americanbiogascouncil.org/resources/state-profiles/california/**
[2] The U.S. Environmental Protection Agency. **https://www.epa.gov/system/files/documents/2023-04/Anaerobic_DigesBon_FaciliBes_Processing_Food_Waste_in_the_United_States_2019_20230404_508.pdf?utm_source=chatgpt.com**
[3] Water Environment Federation.
https://watereuse.org/wpcontent/uploads/2018/10/WRRFBaselineDataFinalReportWEF.pdf
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Comment 18:
Name: Jason Ortega
Date Received: 10/17/25
Source: Email (**JOrtega@palletcentral.com**)
Attachment(s): Yes
Comment:
On behalf of the National Wooden Pallet & Container Association (NWPCA) and our membership, we sincerely thank CalRecycle for the opportunity to provide input on this important Zero Waste Plan.

The NWPCA represents the global wooden pallet industry, including our 450 members in the United States and the over 3,000 predominantly small- and medium-sized businesses that are spread across every state in the nation.

Our industry is deeply committed to the shared objective of achieving zero waste in California. In fact, many of our members operate zero waste facilities today, and our members strive every day to minimize waste and maximize resource recovery across their operations. We are proud to support the state's ambitious goals and look forward to continued partnership in advancing these efforts.

The wood pallet industry is already a key part of California's circular economy and serves as a model for low- and no-waste systems. Pallets form the backbone of supply chains, and their design, reuse, and recycling practices align with the goals of the Zero Waste Plan.

Any campaign to reenvision or redesign wood pallets should focus on amplifying existing best practices.

Proven Circularity and Low Landfill Impact

Wood pallets are among the most recycled products in the U.S. Studies regularly show that less than 5% of wood pallets end up in landfills each year, with the majority being repaired, reused, or repurposed into secondary products like mulch, animal bedding, or biofuel.[i] This circular system enables the pallet industry to achieve the highest documented landfill-avoidance rate among packaging products in the supply chain.[ii]

Industry Tools for Sustainable Design

The industry has invested in advanced tools such as the Pallet Design System™ (PDS) and others. This software enables a pallet manufacturer to scientifically evaluate the mechanical performance of the pallet while reducing waste through efficient design. It allows the pallet unit to have strength and stiffness fit for purpose. Based on fundamental engineering principles, validated with empirical test data, and regularly maintained, the software enables the producer and user to build to a specific design while meeting applicable industry standards and minimizing waste throughout the pallet's lifecycle. Smart design also allows the pallet manufacturer optimize pallet longevity.

Alignment with California's Zero Waste Principles

The pallet sector exemplifies the principles outlined in the draft plan.

- Reuse and Repair: Pallets are repaired and reused multiple times before reaching end-of-life.
- Material Recovery: End-of-life pallets are recycled into valuable products.
- Lifecycle Optimization: Tools like PDS promote resource efficiency and help minimize environmental impact.

Recommendation

We encourage CalRecycle to recognize the pallet industry as a model of circularity and incorporate its practices into the Zero Waste Plan as a best-in-class example. The industry continues to strive for improvement, but the need for a complete "redesign" as referenced in the Draft Plan is unsupported by the data.

We also suggest that future policies support and expand the use of lifecycle design tools, such as PDS, to reduce waste across all material streams further.

Thank you for the opportunity to provide comments. We look forward to working with CalRecycle to advance California's zero waste goals.

Footnotes

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