

Overview of the Waste Management Sector Plan

Assembly Bill (AB) 341
September 17, 2013

Introduction

Issues related to managing and utilizing California's waste resources are diverse and interconnected. Decisions addressing these issues will directly impact how and how quickly we achieve greenhouse gas (GHG) and waste reduction goals. These decisions will also have direct and indirect impacts on other sectors covered in the 2013 Scoping Plan Update. This document proposes a framework for developing a Waste Management Sector Plan and provides information critical to its development. This Overview is organized as follows:

1. Background – What is the purpose of this overview?
2. Process – How is the Waste Management Sector Plan being developed?
3. Principles and Priorities – What is the high-level, integrated vision for addressing waste-related issues?
4. Goal Setting – What are the GHG and waste reduction targets for 2020, 2035, and 2050?
5. Progress Measurement – What performance metrics will be used to track progress?
6. Implementation Mechanisms – What mechanisms will be used to achieve the principles and priorities, and goals identified in 3 and 4?
7. Key Challenges – What are the key challenges to meeting the GHG and waste reduction goals?
8. Implementation Plan – What actions need to occur, who is responsible, and what is the timeline for the actions?

1. Background - What is the purpose of this overview?

The purpose of this overview is to provide guidance and recommendations for developing a Waste Management Sector Plan for achieving California's GHG and waste reduction goals. It also serves to inform the Waste Sector Element of the 2013 Scoping Plan Update. The Waste Sector includes all municipal and commercial solid waste-related activities (e.g., collection, processing, recycling, remanufacturing, treatment, or disposal) from generation to final disposition of the material within California.¹ When looking at the impact of waste reduction activities on GHG emissions, we will be evaluating net environmental impacts throughout the entire life cycle for these waste materials. That is, we will look at changes in the energy requirements beginning with the raw materials and ending when the material is no longer responsible for GHG emissions in California.

¹ Two waste streams that are not addressed in the Waste Sector Plan are medical wastes and hazardous wastes.

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The 2008 Assembly Bill (AB) 32 Scoping Plan initiated the process of identifying opportunities to achieve GHG reductions from the Waste Sector. Control of landfill methane emissions was identified as an early action measure. The 2008 Scoping Plan also identified the need for mandatory commercial recycling and other programs to develop and implement alternatives to landfilling. In the Scoping Plan Resolution 11-32, the Board directed staff to work with CalRecycle and other stakeholders to characterize emission reduction opportunities for handling solid waste, including recycling, reuse, remanufacturing of recovered materials; composting and anaerobic/aerobic digestion; biomass conversion; waste thermal processes; and landfilling.

Further, in the Cap-and-Trade Regulation Resolution 12-33, the Board directed staff to propose a comprehensive approach for the most appropriate treatment of the Waste Sector under the Cap-and-Trade program based upon the analysis of emission reduction opportunities. This document outlines ARB and CalRecycle staff response to the Board's directives.

2. Process – How is the Waste Sector Plan being developed?

In response to the Board directive, ARB and CalRecycle established a joint workgroup to begin developing a Waste Management Sector Plan. The first task of this group was to prepare a series of background technical papers to assist in understanding the issues critical to the development of a Waste Management Sector Plan. The six technical papers cover:

- Recycling, Reuse, and Remanufacturing
- Composting and Anaerobic Digestion
- State Procurement
- Biomass Conversion
- Municipal Solid Waste Thermal Technologies
- Landfilling of Waste

Each paper provides a general description of the waste treatment process, discusses current activities, and identifies opportunities for greater GHG and waste reductions in the future. Each paper also discusses key challenges to achieving a sustainable, low-carbon waste management future and identifies potential solutions to those challenges. The five draft technical papers are provided in Appendix A.

It is critical for the reader to keep in mind that this document is a work in progress. The Overview and the attached technical reports will be modified as necessary based on comments from the other State agencies, stakeholders, and the public. The Implementation Plan discussed in item 8 of this paper will be updated frequently to address the dynamic nature of the implementation of the Waste Management Sector Plan.

3. Principles and Priorities - What is the high-level, integrated vision for addressing waste-related issues?

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California's waste-related issues should be treated consistently in the development of the Waste Management Sector Plan and throughout the 2013 Scoping Plan Update, with the intention of developing low-carbon, economically sustainable industries, technologies, and strategies that align with the state's long-term and integrated energy, waste, and environmental policy objectives. Waste has a critical role to play in enabling a sustainable, low-carbon future, in the context of each sector covered in the Scoping Plan. Waste Sector-specific GHG and waste reduction targets and actions should align with the following overarching principles and priorities:

- Take Full Ownership of the Waste Generated in California
 - ✓ View waste as a resource
 - ✓ Develop a sustainable, low-carbon waste management system that processes collected waste within California
 - ✓ Eliminate, over time, the export of recyclable materials to other states or nations
- Maximize Recycling and Diversion from Landfills
 - ✓ Achieve continuous, measurable increases in the amount of materials recycled, reused, and remanufactured
 - ✓ Reduce the amount of organics and other recyclable materials disposed of in landfills
 - ✓ Evaluate if regulatory or statutory action is needed to phase out landfilling of organics
- Build the Infrastructure Needed to Support a Sustainable, Low-Carbon Waste Management System within California
 - ✓ Incentivize the most beneficial use of waste material based on California's economic, energy, waste, and environmental goals
 - ✓ Incentivize building new infrastructure within California for non-landfill alternatives
 - ✓ Provide technical and economic support to ensure multiple waste handling, processing, treatment, and remanufacturing pathways in California
 - ✓ Streamline air and solid waste permitting and siting of non-landfill alternatives
 - ✓ Develop California-based post-processing and remanufacturing capabilities
 - ✓ Foster State, local, and private cooperation in achieving the Waste Sector goals
 - ✓ Ensure that environmental justice concerns are part of the decision making process
- Improve the Sustainability of California's Waste Management Infrastructure
 - ✓ Identify and support development of markets for recycled, reused, and remanufactured materials

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- ✓ Stimulate markets and demonstrate State leadership by establishing State purchasing and product end-of-life requirements
 - ✓ Stimulate new technologies that reduce GHGs and co-pollutants
 - ✓ Upgrade existing facilities as technology evolves to improve energy efficiency and reduce direct emissions
 - ✓ Reduce direct GHG and co-pollutant emissions from existing waste treatment options
- Reduce the Volume of Waste Generated
 - ✓ Educate all residents on their ability to help achieve California's waste management goals and reduce their carbon footprint
 - ✓ Enhance packaging and product optimization (longer-lasting and easier to recycle)
 - ✓ Enhance producer responsibilities for hard-to-manage waste materials.
 - ✓ Identify opportunities to reduce food waste

Care should be taken to avoid misplaced investments that contribute to single or arbitrary milestones, conflict with other priorities, or otherwise divert resources from achieving long-term objectives.

4. Goal Setting - What are the GHG and waste reduction goals for 2020, 2035, and 2050?

The Waste Management Sector Plan and the Waste Sector Element of the 2013 Scoping Plan should identify 2020, 2035, and 2050 goals for GHG and waste reduction. The proposed goals are as follows:

- 2020 Goal: Achieve the AB 341 75% recycling goal and associated 20 to 30 MMTCO_{2e} reduction
- 2035 Goal: Achieve Net-Zero GHG emissions from the entire Waste Sector and associated GHG reductions²
- 2050 Goal: Achieve a 25% reduction in direct GHG emissions from 2035 levels

2020 Goal: Achieve the AB 341 75% Recycling Goal and 20-30 MMTCO_{2e} Reduction

With the adoption of AB 341 (Chesbro, Chapter 476, Statutes of 2011), a clear mandate was established to achieve a statewide recycling goal of 75% by 2020. Preliminary estimates are that about 22 million tons per year of material will need to be removed from the landfill waste stream and used in non-disposal alternatives by 2020. Achieving AB 341's 75% recycling mandate will result in an estimated 20 to 30 MMTCO_{2e} reduction in 2020 compared to business as usual. Meeting these combined GHG and recycling goals will require greater utilization of existing alternative pathways for waste processing and development of new alternative pathways. Existing alternative pathways include: enhanced recycling, reuse, and remanufacturing; composting; anaerobic and aerobic digestion; biomass conversion; and waste minimization.

² An estimate of the GHG emission reductions will be developed in the future.

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Additional pathways that can also achieve GHG reductions, but, by statute, would not count towards the 75% recycling goal, include municipal solid waste thermal technologies.

2035 Goal: Achieve Net-Zero GHG emissions from the Waste Sector

Beyond 2020, additional reductions in GHG emissions from the Waste Sector will be needed. To achieve these reductions, even greater diversion of organics and other recyclable commodities from landfills and further expansion and enhancement of the alternative non-disposal pathways developed to meet the 2020 goals will be needed. In addition, greater emphasis will need to be placed on reducing the volume of waste generated, recycling/reusing products at the end-of-life, and remanufacturing these materials into beneficial products. Staff proposes a 2035 goal of Net-Zero GHG emissions for the Waste Sector. To achieve Net-Zero, the direct GHG emissions from the Waste Sector would have to be fully offset by avoided GHG emissions. Avoided GHG emissions are reductions in life-cycle GHG emissions that would occur because waste is shifted from landfilling to alternative non-disposal pathways.

2050 Goal: Achieve a 25% reduction in direct GHG emissions from 2035 levels

As a 2050 goal, staff recommends a reduction of direct GHG emission in California from the Waste Sector to 25% below the direct emission associated with meeting the 2035 goal.

5. Progress Measurement - What performance metrics will be used to track progress?

The Waste Management Sector Plan and the Waste Sector Element of the 2013 Scoping Plan should identify how progress in meeting the GHG and waste reduction goals will be measured. These measurement tools must clearly identify issues so that corrective actions can be implemented if necessary. The proposed progress measurement approaches are as follows:

- Now – 2020: Waste Characterization Studies
- 2020 – 2035: Waste Characterization Studies, improved tracking systems, new innovative data collection approaches
- 2035 – 2050: Waste Characterization Studies, further improvements in tracking, data collection, and data analysis

Now – 2020: Waste Characterization Studies

Measuring progress in meeting the 2020 goal (22 million tons of waste per year shifted from disposal and an associated 20 – 30 MMTCO_{2e} reductions) would involve estimating the amount and type of waste going to a particular treatment option (i.e., landfilling, recycling, composting, etc.) using data obtained from the proposed 2014/15 and the 2019 Waste Characterization Studies. Waste reductions meeting the AB 341 2020 goal would be determined directly from the data obtained from the Waste Characterizations Studies. Progress in meeting the associated GHG emission reduction goal would be estimated taking the information provided by the Waste

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Characterization studies and calculating GHG reduction estimates for the amount and type of waste going to each treatment option. To estimate GHG reductions, new and updated emission reductions factors with need to be developed.

2020 – 2035: Waste Characterization Studies, improved tracking, enhanced data collection

Measuring progress in meeting the 2035 goal will likely involve periodic Waste Characterization Studies, improved waste activity tracking, enhanced data collection and developing new and updated emission reduction factors.

2035 – 2050: Waste Characterization Studies, further improvements in tracking, data collection, and data analysis

Measuring progress in meeting the 2050 goal would focus on direct emissions from the Waste Sector and the impact of specific actions to reduce direct emissions from the collection, processing, reuse, and remanufacturing of waste. We envision that data collection would be more real-time and traditional Waste Characterization Studies would be replaced by automated tracking and data collection techniques. Improvements in information tracking and data sharing should allow great access to data being collected for other purposes.

6. Implementation Mechanisms - What mechanisms will be used to achieve the principles and priorities, and goals identified in 3 and 4?

The Waste Management Sector Plan and the Waste Sector Element of the 2013 Scoping Plan Update need to identify what mechanisms or approaches will be used to implement program goals and targets. Implementation mechanisms could include voluntary measures, direct regulation, incentive-based program, bringing Waste Sector sources under Cap-and-Trade, or some combination of these options. It is also important to identify back-up approaches if the selected implementation mechanism is making insufficient progress toward achieving the identified goals. The proposed implementation mechanisms are as follows:

- Now - 2020: AB 341 75% Recycling Goal
- 2020 - 2035: New Direct Regulations or Cap-and-Trade Requirements
- 2035 - 2050: To Be Determined

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Now – 2020: AB 341 75% Recycling Goal

AB 341 established a clear mandate to achieve a 75% recycling goal (and associated GHG reductions) by 2020. Full implementation of the Commercial Recycling Regulation will achieve on the order of 3-5 MMTCO₂e reductions but will not be sufficient by itself to achieve the 75% mandate. CalRecycle is preparing a Report to the Legislature, due January 1, 2014, that will provide additional recommendations on how to achieve the AB 341 75% statewide goal. Much of this will likely entail financing of new recycling manufacturing infrastructure, continued focus on moving organic materials from landfills to other non-disposal uses, establishing new funding sources for local and state programs, establishing a broader extended producer responsibility framework, and clarifying the role of energy recovery.

For the Commercial Recycling component, it will be critical that ARB and CalRecycle closely monitor its implementation from now through 2020. If information from Waste Characterization Studies or other sources indicates that insufficient progress is being made to achieve the initial GHG reduction goal associated with the Commercial Recycling regulations or the AB 341 75% recycling mandate, then adopting direct source-specific regulations (i.e., restrict landfilling of organics) or bringing landfills and/or mass burn thermal technology facilities under Cap-and-Trade would become necessary.

2020 – 2035: New Direct Regulations or Cap-and-Trade Requirements

Beyond 2020, additional mechanisms may be needed to achieve the Net-Zero goal. Possible options include developing source specific regulations (i.e., restrict landfilling of additional recyclable commodities) or bringing Waste Sector sources under Cap-and-Trade.

2035 – 2050: To Be Determined

Mechanisms needed to achieve an additional 25% reduction in direct emissions by 2050 remain to be determined. Adjustments to existing regulations or Cap-and-Trade requirements, or developing new regulations may be needed. At the same time, a combination of voluntary, fee-based, or incentive programs may prove effective in providing further improvements to the waste infrastructure.

7. Key Challenges - What are the key challenges in meeting the GHG and waste reduction goals?

The challenges to meeting GHG and waste reduction goals need to be addressed with the understanding that California must take full ownership for the wastes generated within its borders. Shipping waste, even recyclable products, to other state or nations is not a viable, long-term, environmentally appropriate, waste management practice for California. Furthermore, exporting waste denies California the economic opportunity of

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significant job growth that would result if these materials were remanufactured in California.

Within the framework of “California Owns It”, challenges in achieving the GHG and 75% recycling goals are those associated with reducing generated waste and those associated with developing non-disposal alternatives for handling waste that we generate.

Specific challenges to reducing the amount of waste generated in California include:

- Educating Californians to take responsibility for the waste they generate
- Evaluating what type of regulatory or statutory action is needed to phase out landfilling of organics
- Empowering the public to purchase products with low-waste or no-waste attributes, thereby reducing their carbon footprint
- Emphasizing packaging option and producer responsibilities
- Reducing food wastes through more efficient farm, packing house, retail, and consumer practices

Specific challenges to making non-disposal alternatives viable in California include:

- Developing financing options to achieve needed infrastructure expansion
- Streamlining permitting of new and up-graded facilities, including addressing cross-media regulatory issues
- Facilitating siting of new and up-graded waste management facilities with respect to length of time for approval, CEQA, and local community and regional planning and acceptance, including environmental justice concerns
- Developing markets for recycled, reused, remanufactured materials (such as paper) and for residual waste materials generated from non-disposal alternative (such as ash)
- Incentivizing purchase of GHG-friendly sources of electricity and biogas from waste processing facilities
- Showing State leadership by purchasing products in keeping with the GHG and waste reduction goals
- Co-locate new waste treatment facilities at existing waste sites to minimize permitting issues and environmental impacts

8. Implementation Plan - What actions need to occur, who is responsible, and what is the timeline for the actions?

For the Waste Sector, ARB and CalRecycle staffs have developed an Implementation Plan based on the tasks identified in the technical papers: Recycling, Reuse, and Remanufacturing; Composting and Anaerobic Digestion; Biomass Conversion; Municipal Solid Waste Thermal Technologies; Landfilling of Waste; and, State Procurement. The Implementation Plan serves as a working model to address the issues and activities associated with achieving the AB 32 GHG emissions and AB 341 waste reduction goals. The Implementation Plan is provided in Appendix B and includes:

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- Ongoing activities related to the issues discussed above
- Additional activities and decisions that will need to be made in order to achieve the goals listed above
- Timelines for completing ongoing activities and initiating new activities
- Opportunities for state agency and external stakeholders to provide input on the Waste Management Sector Plan and the Implementation Element of the Waste Management Sector Plan, prior to adoption of the Waste Sector Element of the 2013 Scoping Plan Update.

9. Appendices

- Appendix A, Technical Papers
 - Recycling, Reuse, and Remanufacturing
 - Composting and Anaerobic Digestion
 - State Procurement
 - Biomass Conversion
 - Municipal Solid Waste Thermal Technologies
 - Landfilling of Waste
- Appendix B, Implementation Plan