

Organics Roadmap IV - 2011

This is the fourth in a series of annual Organics Roadmaps developed primarily to address organic materials, the largest category of materials disposed in California landfills and the focus of CalRecycle's Strategic Directive 6.1, which calls for a reduction of 50% in the amount of organics disposed by 2020. Previous Roadmaps were presented at California Integrated Waste Management Board meetings and outlined the many challenges and opportunities for increasing organics diversion along with the program activities underway. While many of these challenges and opportunities remain the same, this Roadmap focuses on several high-level policy drivers that provide the opportunity to significantly impact the organics waste stream. It also describes associated CalRecycle program activities (Attachment 1) that continue to shape California's pursuit of increased organics diversion.

Organics in the Waste Stream

Californians disposed approximately 32 million tons of material in 2009. Based upon CalRecycle's most recent Statewide Waste Characterization Study, carbon-based organic materials comprise approximately 2/3 (or 21 million tons) of what is disposed in landfills. Of this statewide disposal total, compostable materials, including food and vegetative materials, account for more than 20 percent (or 6.4 million tons). Food is the largest subcomponent of these compostable materials, comprising nearly 16 percent (or 5.1 million tons) of the total statewide disposal, which equates to 330 pounds per person per year of compostable organic waste disposal of which 265 pounds is food waste. Of the remaining carbon based materials in the disposed waste stream, much of it is non-compostable and/or difficult-to-recycle organic material, such as wood waste (15% or 4.8 million tons), which may be suitable in some cases for mulch and in others for biofuels and bioenergy applications.

Current Status of Organics Diversion

CalRecycle's "Third Assessment of California's Compost and Mulch-Producing Infrastructure-- Management Practices and Market Conditions" report (published in 2010, available at www.calrecycle.ca.gov/Publications/default.asp?pubid=1358) indicated that approximately 9.3 million tons of organic materials were processed in 2008. This organics diversion was accomplished by over 200 facilities, including traditional "composters," facilities that actively compost organic material, and "processors" and "chippers and grinders," facilities that process material but do not compost the materials they produce. This infrastructure has grown significantly since the early 1990s, when only a handful of permitted facilities existed in the state, and this growth has been aided in part by CalRecycle demonstration projects, research studies, and regulations that protect public health and safety while allowing for market development.

However, to meet the goals of Strategic Directive 6.1, California will need to divert more than 10 million tons MORE organics per year, which is more than double the current processing capacity in the state. Unfortunately, the annual amount of processed organics has remained fairly stagnant over the past several years and, in fact, decreased by approximately 500,000 tons since CalRecycle's previous 2003 infrastructure study. This stagnation in processing capacity is a reflection of the many barriers faced by composters and processors, including several key barriers associated with new and emerging regulations

for air quality, water quality, and food residual management. For example, new and emerging regulations could increase the capital and operating costs of composters and processors who would be challenged to identify new revenue streams to offset increases in their production costs. These are briefly listed below:

- Pending local air district rules to reduce volatile organic compound emissions from piles of composting greenwaste feedstocks (e.g., San Joaquin Valley Unified Air Pollution Control District Rule 4566 and South Coast Air Quality Management District Rule 1133.3);
- Imposition of federal New Source Review and Title 1 permitting for new compost facilities within the San Joaquin Valley Unified Air Pollution Control District, which will require Best Available Control Technology and costly offsets for new or expanded facility permits. The South Coast Air Quality Management District will likely impose similar restrictions;
- State Water Resources Control Board and Regional Water Quality Control Boards' Waste Discharge Requirements and Stormwater Permits; and National Pollutant Discharge Elimination System (NPDES) permit requirements;
- CalRecycle regulatory provisions that some suggest impede the development of food waste processing;
- New requirements from the California Department of Food and Agriculture for the registration and labeling of bulk compost intended for organic production; increased scrutiny of compost facilities providing inputs for organic agriculture;
- Reports of pathogens (e.g., e-coli O157:H7 and salmonella) found in finished compost and food products;
- Presence of pesticides that persist through the composting process (e.g., bifenthrin) that may impair the acceptability of products being used for organic food production or a composters' organic certification;
- Presence of regulated pests (Light Brown Apple Moth, European Grapevine Moth, Asian Citrus Psyllid, Sudden Oak Death, etc.) that affect the movement of organic material from county to county;
- Difficulties in siting new composting facilities in proximity to urban areas where large amounts of organics are generated.

For a detailed discussion of these barriers, please refer to Organics Roadmaps I, II, and III at www.calrecycle.ca.gov/Organics/RoadMap08/default.htm.

These issues are difficult to resolve, particularly in the case of regulatory efforts that are driven by important environmental policy goals. CalRecycle has worked diligently, and continues to do so, to foster rulemakings that achieve these environmental goals while providing flexibility and reasonable provisions for composters and others to attain compliance in a cost effective manner. These regulatory barriers can translate into economic barriers that prohibit organics diversion infrastructure development. The industry tends to be marginally profitable, in part because it has to compete with lower cost landfill disposal options for sourcing feedstock and lower-priced synthetic fertilizers which do not provide the additional environmental benefits of compost.

The Future

Traditional organics processing would need to expand by nearly 70% to handle just the compostable materials currently disposed, and it would need to more than double to handle this and the non-compostable portion. If traditional organics processing is unable to expand, other ways to handle organic materials will need to be developed. One technology that appears particularly promising is anaerobic digestion (AD), which has the potential to handle odorous and putrescible wastes such as food waste, meet strict environmental performance standards, and capture new revenue streams through the production of renewable energy and low carbon fuel. In addition, neither traditional composting or AD operations can handle all of the organics wastestream, particularly non-cellulosic and hence non-compostable components. Other thermochemical "Conversion" technologies (CT) such as combustion, gasification, and pyrolysis, may also be needed to turn organic materials into revenue generating commodities such as bio-char, electricity, and fuel. However, thermochemical CT facilities have been the subject of much debate related to their statutory definitions, potential impact on feedstock availability for other processes, environmental performance, and economic viability. Nevertheless, several jurisdictions are evaluating the potential of thermochemical conversion technologies to produce bioenergy and biofuels from residual organic materials that otherwise would be landfilled after recyclable and compostable materials are removed.

Policy Drivers that Provide New Opportunity

Several State policy drivers have the potential to significantly impact organic diversion, and CalRecycle is working with relevant agencies to capitalize on these opportunities. These include:

- Global Warming Solutions Act (AB 32), which requires a 30% reduction in greenhouse gas emissions by 2020, and the call to deal with climate change adaptation, both dependent on organic materials.
- Water Use Efficiency, another key component of the AB 32 Scoping Plan, which details water-efficient landscape requirements that include the use of compost for reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion;
- Low Carbon Fuel Standard (LCFS), which requires a 20% reduction in the carbon intensity of fuels by 2020 and 30% by 2030.
- Renewables Portfolio Standard (RPS), which requires 33% renewable energy by 2020.
- Bioenergy Action Plan, which identifies challenges to the development of facilities that generate electricity or produce fuel from biomass and actions that the Bioenergy Interagency Working Group will take to address those challenges.
- AB 118 Alternative and Renewable Fuels and Vehicles Program, which provides over \$100 million to incentivize renewable transportation fuels.

These policies incorporate a combination of mandates, regulations, incentives, and market-based mechanisms in all of which organics can play an important role. With the abundance of organic wastes being disposed in California, these policy drivers provide opportunities to further redefine organic materials as resources, making them into usable products that help solve multiple environmental issues.

However, funding to support research and the development of financial incentives is needed to capitalize on the opportunities presented by this set of policy drivers.

CalRecycle Activities

Many activities are needed to increase traditional and new organics processing capacity throughout California. CalRecycle's efforts are documented in the Organics Roadmap IV (Attachment 1) and summarized briefly below:

1. Education and Promotion: CalRecycle continues to promote the benefits of compost and mulch, such as their positive impacts on climate change, water conservation, water quality, and soil health, and their short and long-term benefits to agriculture.
2. Research, Product Standards, and Technical Evaluations: CalRecycle's research on compost in agriculture, water retention and erosion control, and VOC and other emissions has been key in helping establish a more sound foundation for market development and appropriate regulations. However, CalRecycle funding is currently not available for further efforts. As a result, CalRecycle will continue to promote its existing research on organics regarding best management practices, work with agencies on consistent specifications and standards to ensure the highest quality materials, proactively investigate pathogen claims in finished compost and objectively determine if the investigation results agree with those claims, and where possible, conduct technical analyses that quantify environmental benefits (e.g., erosion control, water holding capacity, greenhouse gas reductions, etc.).
3. Siting and Capacity: CalRecycle will continue its activities to streamline permitting (for example, through completion of its Program Environmental Impact Review on Anaerobic Digestion and its ongoing review of CalRecycle composting regulations), and to collaborate with regulatory agencies and organics stakeholders on the development of other agencies' environmental regulations that may impact the organics infrastructure.
4. Economic Incentives: CalRecycle continues to pursue additional incentives, such as
 - Working with the ARB to develop an AD fuel pathway for the Low Carbon Fuel Standard that incorporates food and other organic wastes, including the organic fraction of municipal solid waste, as feedstock for the production of low carbon fuel;
 - Working with the CEC's AB118 Alternative and Renewable Fuels and Vehicles Program to fund projects that use biomass and MSW feedstock or are co-located at solid waste facilities. In the 2011 draft AB 118 Investment Plan, \$8 million is allocated for pre-landfill biomethane projects;
 - Collaborating with the Climate Action Reserve and the ARB to develop greenhouse gas emission reduction protocols which in the long-run will be critical to secure new sources of revenue to support the collection and processing of organic material that is currently being landfilled;
 - Continuing to provide low interest loans through the Recycling Market Development Zone Loan Program to projects such as Environ, Inc. and the Inland Empire Utilities Agency in Chino to be used to purchase pre-processing equipment for an anaerobic digestion project that will process food waste derived from commercial and industrial sources to produce biomethane gas.

Other ideas that may incentivize diversion include increasing the Integrated Waste Management Fee, which has not been increased in almost ten years, and allowing a portion of that fee to be used to increase organics diversion via grants, loans, and research; or pursuing market-based incentives that may become available, such as payments for GHG emission offsets to help bridge the cost differential between low cost landfill disposal and higher cost processes that produce value added organic products.