Following Through on California's Compost Promise

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May 2017

EXECUTIVE SUMMARY

As the state of California works towards ambitious environmental goals, the organics recycling sector has been cast in a lead role. This diverse group of public, private, and on-farm recycling operators uses methods both ancient and high-tech to turn organic materials into compost, and in so doing is poised to help California reduce its carbon footprint, manage its droughts, and transition to a greener economy. But current market conditions endanger the sector's ability to deliver on its potential, while regulatory structures undercut the state's vision for the crucial role of organics recycling. This report addresses both of these dimensions, charting a path forward on how we can fulfill the *promise of* and *promises to* California compost.

Composting is the biological decomposition of organic materials by microorganisms under controlled aerobic conditions that produce a soil amendment and fertilizer prized by farmers. Of the estimated 30.2 million tons of waste that California annually disposes of in landfills, more than 40 percent is suitable for organics recovery strategies like composting. The failure to divert organic compostables from the state's landfills results in anaerobic decomposition of these materials, which causes the release of methane, a greenhouse gas (GHG) 25 times as potent as carbon dioxide. Composting organic material produces a fraction of the GHGs emitted by the same material in landfills, and there are other important benefits gained by applying finished compost to agricultural land including improved soil carbon sequestration, microbial activity, soil water content, water infiltration, and total organic matter and nitrogen. In aggregate, compost production and use has enormous potential to help address some of California's most formidable challenges, like climate change mitigation and groundwater management.

In fact, the state government has acknowledged compost's central role in addressing these issues, passing legislation setting ambitious standards that require diverting 50 percent of the state's organic waste from landfills by 2020, and 75 percent by 2025, in addition to bold GHG reduction targets. Based on these benchmarks, however, an estimated 169 new facilities must be built to meet the 2025 target, and few experts believe this goal will be achieved given the compost industry's underdevelopment.

Problems Facing the Compost Sector

At precisely the moment when the compost sector must rise to the challenge of an aggressive growth trajectory, a confluence of factors have instead slowed expansion of statewide composting, including:

1. **Imperfect Information:** the benefits and harms of compost production and use are not well quantified by scientific research. At the same time, current and potential compost consumers face imperfect information regarding the nutrient content and quality of finished compost. An accurate, timely assessment of facility throughput and capacity at the state level is also lacking.

2. **Regulatory Conflict:** regulations of composting practices and facilities are extremely complex and lack clarity. Regulatory statues have conflicting definitions and parameters, and were developed without sufficient collaboration between agencies or input from farmers. Some regulations are not informed by sufficient scientific evidence. Regulations may also disincentive the diversion of organic waste from more harmful management practices toward compost production.

3. **Underproduction of Compost:** the market price for compost does not reflect its true social value, so compost is underpriced. Additionally, demand among municipalities for organic waste hauling services is not yet sufficient to drive compost production.

4. **Overuse of Landfills:** landfilling organic material is too cheap in comparison to organics recycling. Regulations against land application of organic materials are not adequately enforced, making illegal land application a low-cost option for organic waste disposal compared to landfilling.

5. **Underinvestment by the State:** state investment in the compost sector has been inconsistent and insufficient to encourage the compost industry to grow at the rate necessary to meet legislative mandates. Existing state funding for composting facilities is reliant on volatile Greenhouse Gas Reduction Funds—which are funded by cap-and-trade auction proceeds, appropriated annually by the Legislature, and therefore not guaranteed on a consistent basis—dissuading private investment in the sector.

Analytical Approach and Criteria

The objective of this report is to identify policy alternatives that will eliminate the regulatory and economic obstacles currently limiting the production of abundant, affordable, high quality compost throughout the state of California. The policies recommended aim to increase the share of organic waste diverted from landfills across the state, encourage the vitality of on-farm composting, and ultimately result in more compost production.

The policy alternatives identified to meet this goal were analyzed across four criteria and ordered by temporal priority and political feasibility. Alternatives were evaluated using the following criteria:

- Effectiveness: the degree to which a policy alternative results in the production of abundant, affordable, high quality compost throughout the state. Additional weight is given to how effective the policy will be at diverting organic waste from landfills in the timeline specified by the Legislature.

- Efficiency: given the monetary costs involved in a policy alternative, the magnitude of the impact of state investment in a particular policy is considered. Efficiency can be thought of as a cost-effectiveness assessment of a proposed policy.
- Equity: process equity weighs whether the policy alternative helps or hinders the participation of small-scale and on-farm composters. Distributional equity evaluates the implications of a policy alternative's cost incidence on California residents, ratepayers, compost producers, and farmers. Environmental justice will consider whether a policy treats all Californians fairly regardless of race, color, national origin, or income.
- Feasibility: comparing policy alternatives requires analyzing their projected political feasibility and likely administrative outcomes given the actors, events, and environments involved in implementing the proposed alternatives.

Recommendation: Ordered Policy-Making Priorities

The resulting recommendation presents the best options for advocates to pursue and for the state to enact, in the following ranked order. These recommendations give priority to political feasibility, which will factor strongly into the state's ability to take the necessary steps toward reaching its organic waste diversion goals.

1. Invest in Research

Research is given the highest priority as it interacts with and enhances all other policy options, allowing regulators, producers, and compost consumers alike to understand the realistic threats that compost production and use pose to air and water quality. Therefore, the state should fund research to better quantify compost's environmental benefits and harms, as present regulatory decision-making is hindered by a lack of sound scientific evidence. In particular, research should focus on the carbon sequestering capacity of compost, the impact of manure composting on water quality, and the emissions of GHGs and other air pollutants during compost production. Research on the ecological effects of manure is especially important to the regulation of on-farm and commercial manure composting, as responsible manure management plays an integral role in supporting the state's dairies. Though research will require modest state funds, such an investment is instrumental to advancing environmental science, agricultural technologies, and regulatory policy.

2. Prioritize Enforcement of Land Application

The practice of illegal application of compostable materials to open lands is an ongoing problem throughout California, especially for counties with a high proportion of socioeconomically disadvantaged communities. Enforcement of existing laws and regulations that restrict application of organic waste on open land can effectively drive organic waste toward recycling methods, thereby

increasing compost production. With Alternative Daily Cover of organic materials on landfill operations no longer counting toward waste diversion goals as of 2020, it will be even more important to prioritize enforcement so that municipalities and haulers do not turn to land application as an inexpensive alternative to organics recycling. Given that regulations already prohibit some application of organic materials to lands, it is the state's duty to ensure the necessary staffing and resources are in place to enforce proper land application practices.

3. Nurture Regulatory Reform

Regulatory reform can help overcome the complex and at times conflicting regulatory landscape that confronts composters. This regulatory confusion indicates a need to demystify the regulatory landscape so that compost producers have clear rules that are consistent across regulatory agencies and reflect compost's known benefits and hazards. Suggested modifications include:

a) Changing regional air board rules to take a lifecycle view of emissions from composting facilities, recognizing that producers who expand composting capacity are diverting waste from other practices that are more harmful to air quality. Such a recalculation would lessen the mitigation measures that new or expanding facilities are required to take based on New Source Review guidelines, thereby making the establishment and permitting of facilities more straightforward and less expensive.

b) Reclassifying manure as a Tier I, rather than Tier II, feedstock under the Water Board's General Order, recognizing that manure composting mitigates many of the dangers posed by animal waste and there is no evidence that composting manure poses the same threat to groundwater as synthetic sources of nitrogen. This change would help small- and mid-sized facilities in regions with large quantities of dairy manure, as well as farms operating near the source of both feedstock suppliers and agricultural consumers. In particular, changing manure's classification could help farms by enhancing the potential for manure to be mixed with crop residue on farms close to dairies.

c) Aligning agricultural exemptions in the General Order and CalRecycle regulations such that the definitions of agricultural materials are standardized between agencies. The General Order does not consider manure as an agricultural material and instead classifies it as a Tier II feedstock, while CalRecycle includes manure in its definition of agricultural material. This makes compliance both confusing and more costly, as management of Tier II feedstocks is cost prohibitive for many small-scale composters. Furthermore, limitations on feedstock allowed onsite (both at any time and annually) are inconsistent between CalRecycle and the Water Board, resulting in a complicated matrix of composting "categories," shown in Appendix C.

d) Streamlining the permitting process for the approval of new composting facilities. The legislative mandate of AB 1045 requires state agencies to coordinate the permitting and regulation of new and expanding facilities, though substantive steps to streamline permitting have yet to occur. The various working groups of AB 1045 could be leveraged to improve agency collaboration so that composting capacity is expanded to meet the anticipated needs of municipalities in a more timely manner. One path this could take is the use of a program Environmental Impact Report (EIR) for compost facilities at multiple scales and using various technologies. If CalRecycle were to become the lead adoption agency of the program EIR, duplicative efforts of reconsidering basic policy decisions could be eliminated and the task of preparing environmental documents would be simplified for new facilities. This could significantly aid local agencies in siting and permitting compost facilities, as applicants would only need to provide project-specific details as an addendum to the program EIR.

Current regulatory confusion is undeniable and will continue to constrain the development of small-scale and on-farm composting, in addition to slowing the construction of larger, better-funded commercial facilities. The proposed changes require minimal additional financing given that the regulatory and administrative mechanisms needed already exist; however, political momentum must be harnessed to see through implementation.

4. Secure a Continuous Appropriation for Organics Infrastructure

While research, enforcement against illegal land application, and regulatory reform are essential to pushing the state's organics recycling efforts forward, the composting industry will continue to face economic hurdles if substantial and consistent funding is not secured. CalRecycle estimates that as much as $100 million per year for five years is needed to fully support the implementation of AB 1826 and SB 1383, illustrating a serious need for the state to commit substantial financial resources for developing organics recycling infrastructure. Present funding for infrastructure and market development is supported by unstable cap-and-trade funds, which in turn support programs that are severely oversubscribed. Though an appropriation from the General Fund of the size suggested by CalRecycle would be politically challenging, a sustainable funding mechanism is nevertheless critical to accelerating the growth of the organics recycling market so that it satisfies the state's legislative mandates and timeline.

5. Subsidize and Stimulate Compost Production

Subsidies are effective policy instruments in markets that fail to produce enough of a socially desirable good, which is true of compost due to its many environmental benefits. A $10 per-ton subsidy for compost produced by way of policy drivers could inject enough money to encourage compost production, particularly in regions where composting infrastructure is underdeveloped. For

producers receiving a $10 per-ton subsidy on qualifying compost produced from material diverted from landfills, this price is equivalent to 30 to 100 percent of what is typically charged per ton of compost. Therefore, such a subsidy could provide significant supplementary revenue to compost producers. In order to stimulate demand for new production of compost, the state could stipulate compost usage targets or requirements for public agencies, similar to the specifications CalTrans currently follows. By stabilizing and encouraging compost production in underinvested regions, a per-ton subsidy could also correct urban bias in state resource allocation, though such a subsidy is unlikely to bring many new large-scale firms to the market. Implementing a per-ton subsidy could be administratively burdensome (a program would need to be developed to measure new tonnage and disburse subsidy dollars), while requiring action on the part of the Legislature (to appropriate funding for the subsidy and pass targets for compost use among public agencies).

6. Establish a Generator Fee

Another mechanism that could supply a sustainable funding source for the development of the organics recycling sector is the introduction of a "generator fee" of $0.10 to $0.20 per month on the disposal bills of ratepayers. The fee could be graduated such that larger generators of waste pay more than typical home and apartment residents. Similar modest fees are already present on other utility bills including electricity (for which a fee of approximately $0.17 is assessed per month), and can offer significant funding for infrastructure and other organics recycling projects. At the upper limit of a flat rate of only $0.20 per month, California ratepayers could contribute $30.5 million in funding on an annual basis. The money raised from a generator fee on waste disposal bills would be a predictable, sustainable source of funding that could be directly utilized for organics recycling efforts for as long as the state deems appropriate. Passing legislation to introduce such a generator fee may prove to be politically challenging, as Legislators will likely be hesitant to directly "tax" ratepayers.

7. Create a Voluntary Compost Nutrient Certification Program

A voluntary certification program for the nutrient content of commercially produced compost could reduce conventional farmers' hesitancy in using compost by supplying adequate information about its nutrient content and quality to buyers. Conceiving and implementing a new nutrient certification program would presumably involve some costs to the state, while compost producers themselves would also have to invest more of their resources to meet quality standards. Therefore, a voluntary nutrient certification program is one of the final recommendations considered, as it could be administratively complex and face low rates of use. Finally, consumer and producer interest in a certification program is varied, as some in the industry claim that gains in compost quality sought through a nutrient certification scheme could be secured through less formal instruments.

8. Raise the State Municipal Solid Waste Disposal Fee (Landfill Tipping Fee)

The final alternative examined in this report is an effort to make a "substitute" to composting organic materials less financially attractive by raising the state municipal solid waste disposal fee charged by landfills. Requiring a higher waste disposal fee would help remove the present lack of financial incentive to divert organic waste from landfills, thereby helping California reach its statewide recycling goals. The state has failed to increase the waste disposal fee of $1.40 per ton of waste since 2001, or adjust this fee for inflation, making landfilling an inexpensive option available to municipalities for organic waste disposal. Existing political opposition to raising the waste disposal fee will continue to prevent change in the Legislature, where a bill to increase the fee was defeated as recently as 2015. However, increasing the waste disposal fee will likely become more viable as local governments recognize its role in helping to develop the organics recycling capacity and infrastructure that municipalities will rely on.

Limitations and Further Steps

While this report aims to give a comprehensive perspective on the market and regulatory challenges faced by California's compost industry, there are multiple aspects of the sector that were beyond the scope of this analysis. Moving forward, the effectiveness of existing legislative policy drivers must be carefully and continuously studied as they come into effect to determine the most impactful ways for the state to intervene. Secondly, research is needed to project in greater detail whether municipalities will be able to meet the state's goals, particularly without substantial financial support from the state. An additional area in need of deeper investigation is the impact that more stringent physical contaminant requirements will have on the demand for and costs associated with commercially produced compost. Finally, the stakeholders involved in this complex system are wide-ranging and diverse, making the impacts of legislative and regulatory changes on these groups exceptionally hard to predict. As legislative mandates take effect and more data is gathered under various policy instruments, the state will be better equipped to form a clear strategy to foster the growth of the organics recycling sector.