



State of California

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Organization and Economy

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AGENDA:

Business Meeting

10:00 a.m.

Tuesday, May 23, 2023

Join Online or By Phone Via Zoom

Online: <https://bit.ly/3Biy1n2>

Toll Free Phone: (888) 788-0099

Webinar ID: 924-0585-0852

Passcode: 989081

1. Draft report on SB 1383 implementation
 1. Public comment (limited to 3 minutes per speaker, 30 minutes total)
 2. Commission consideration of draft report

Pedro Nava, Chairman

Sean Varner, Vice Chairman

Dion Aroner

David Beier

Anthony Cannella

Phillip Chen, Assemblymember

Bill Emmerson

Gil Garcetti

José Atilio Hernández

Dave Min, Senator

Liz Ortega, Assemblymember

Janna Sidley

Scott Wilk, Senator

Ethan Rarick, Executive Director

Introduction

In 2016, California's leaders enacted a once-in-two-generations reform to combat climate change. In passing SB 1383, the state set an ambitious and laudable goal to divert large amounts of organic material out of landfills, reduce dangerous greenhouse gas emissions and improve the state's air, water, and soil quality, as well as Californians' health. The change impacted every city and county, and required Californians to change habits so ingrained they had become muscle memory. It was deemed so vital to the wellbeing of the state that it came with a \$10,000 per day fine for local governments that did not comply and even authorized fines for individuals.

California set specific goals with short deadlines. Using 2014 as a baseline, SB 1383 required the state to reduce the amount of organic material deposited into landfills by 50 percent by 2020, and by 75 percent by 2025. The purpose was to reduce methane emissions to make near-term improvements to climate change. Methane is a short-lived super pollutant that is extraordinarily efficient at trapping heat, and thus at contributing to climate change. Landfills are the largest point source of methane emissions in California,¹ and meeting the state's 2025 goal would achieve the environmental equivalent of removing 3 million cars from our roads.²

California's ambitions were far ahead of any other state in the United States, a fact of which the state should be proud. Sadly, California is falling short of its goals. Despite the importance of diverting organic waste, the state not only missed its 2020 target, but sent a million tons of organic waste *above* the 2014 baseline to landfills.³ The Little Hoover Commission's review of the bill's implementation found that the state is poised to miss its 2025 target.

This report on organic waste disposal and its central role in responding to climate change is consistent with the state's ambitions, but seeks to focus attention on how changes in implementation can advance the ultimate goal. To this point, there has been insufficient progress to make the 2025 goal realistic. Keeping an unrealistic target could undermine public confidence, increase noncompliance and delay adoption of mid-course policy corrections that are routine in projects of this size.

The outcomes are too important and the costs of failure too high to let this effort fade into irrelevance, gnawed at by court decisions until it becomes unrecognizable. The state must reduce its landfill methane emissions, and it must do so in a way that is transparent, compatible with its larger climate strategy, and has the buy-in of the Californians it protects.

Part I: A Pause in Implementation

In 2016, the Legislature and Governor enacted SB 1383, which sought to divert most organic waste away from landfills and into greenhouse gas reducing activities. Using 2014 as a baseline, the legislation required Californians to divert 50 percent of organic waste away from landfills by 2020 and 75 percent by 2025. It also required the state to recover and redistribute at least 20 percent of edible food that otherwise would have been thrown away. This is the largest change to how Californians throw away their waste since the state's recycling program was enacted in 1989.

The object of the bill was to provide tools to combat climate change through a focus on pollutants that exist in the environment for a shorter period of time than carbon dioxide but still greatly contribute to a warming planet. Such pollutants also cause health impacts. Particulate pollution and increased ozone

levels have been linked to cancer, heart disease and asthma. The impact is especially pronounced in disadvantaged communities.

The Legislature charged the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with the California Air Resources Control Board (CARB), to create the implementing regulations, specifying they could not go into effect before 2022. It also tasked CalRecycle with assessing the progress the waste sector and state and local governments had made toward meeting the waste reduction requirements by 2020. If the department found insufficient progress, the legislation authorized it to include additional incentives and requirements in the regulations, as well as the ability to recommend revisions to the goals to the Legislature. Finally, it authorized local jurisdiction to charge fees to cover the costs of compliance.⁴

Where are we now?

The state missed its 2020 target and is likely to miss its 2025 target. Only about half of local governments have failed to implement collection systems as required, causing the Legislature to defer noncompliance penalties.

2020 Target Missed. The state missed its 2020 target to reduce the amount of organic material deposited into landfills by 50 percent below 2014 levels. Instead, the amount of organic waste going into landfills increased by a million tons from 2014 to 2020.⁵ California state environmental leaders explained that this was not unexpected: “Until this year, CalRecycle’s regulations to meet organic waste targets were not enforceable,” testified CalEPA Deputy Secretary Sheeren D’Souza in September 2022, “so it makes sense that the 2020 diversion rate required in 1383 was not met.”⁶

2025 Target in Doubt. California is unlikely to meet its 2025 goals. To do so, the state would need to divert 27 million tons of organic matter per year away from landfills. The state believes 9 million of that is edible food that can be recovered for human or animal use, contains fibers that can be converted into paper products, or is suitable as feedstock for biomass energy plants. The other 18 million tons will need to be processed, per CalRecycle’s regulations, at composting, anaerobic digestion, co-digestion, biomass electricity, and mulching facilities. As of 2020, the state anticipates that by 2025 it will only have the capacity to process 10 million tons of that waste.⁷

Building the additional infrastructure that would be needed to meet the goal is expensive. “The single largest factor impacting the cost of the proposed regulation is the projected amount of disposal that must be redirected to recovery activities,” wrote CalRecycle during the rulemaking process.⁸

Setting aside the cost, there is little hope the infrastructure could be planned, permitted, and constructed by 2025. A \$100 million anaerobic digester in Perris, California, for example, took six years to permit and construct.⁹ Even if this funding and speed were replicated elsewhere, the facilities would not be online until well after the 2025 deadline. Additionally, the time and money necessary to construct roads and other infrastructure needed to comply with the legislation in rural areas were not factored into the regulatory timeline and cost estimate.¹⁰

Local Governments Still Catching Up. Regulations required most local governments to adopt ordinances implementing the legislation and have an organic waste curbside collection program in place by January 2022. Noncompliance can be punished by fines ranging from \$500 to \$10,000 per day, depending on the

violation. There are steps CalRecycle must take to help the local government attain compliance before it levies fines.

Only about half of the state's 540 local jurisdictions were known to be in compliance with this requirement by January 2022. Recognizing the difficulty facing local governments, the Legislature pushed back state enforcement of regulations by up to three years for local jurisdictions willing to file and adhere to an action plan known as an Intent to Comply.¹¹ When CalRecycle and CalEPA testified in September 2022, they said more than 120 out of California's 540 jurisdictions had filed for this opportunity to extend the deadline to adopt ordinances, adjust contracts with their waste management service providers, and make programmatic changes necessary to implement the legislation.¹² CalRecycle was unable to update this figure closer to this report's publication date, citing ongoing compliance evaluations.¹³

A Temporary Pause

The methane reduction goals of SB 1383 are of utmost importance to ensuring a livable state.

The Commission encountered a passionate community of devoted public servants; environmental champions; industry leaders who believe their role includes stewardship of the environment; and entrepreneurs willing to bet their livelihood on the idea that reducing methane emissions can be profitable and spur economic development. Despite differing perspectives, goals, and visions for the future, the Commission found the community largely to be engaging in good faith conversations about and efforts in implementing the legislation and reducing landfill methane emissions.

However, given the problems outlined above, we believe the Legislature should enact a temporary pause to the implementation of SB 1383.

Successfully implementing the bill will require changes in law and regulation, additional funding, and creating a more holistic approach to reducing landfill methane emissions. Local jurisdictions must be given a fair and realistic amount of time to make necessary changes. Just as importantly, Californians must buy in to the legislation and its goals. Public works agencies have been diligent about updating Californians about changes to what waste they can put into which bin, but Californians must understand why they are making these changes and see how their actions impact the state's outcomes. None of this can happen overnight, and it is worth taking the time to get it right instead of spending years mired in court cases.

The Commission believes it is particularly important that the state complete the following recommendations during the temporary pause:

- Educate Californians about the importance of the goals behind SB 1383 and how SB 1383 will create a path toward accomplishing those goals.
- Coordinate among its own agencies to prevent conflicting directives and create clear guidelines on meeting statutory and regulatory requirements, as well as to streamline permitting requirements to develop waste-processing infrastructure.
- Create a multidisciplinary team to expand market opportunities for recycled organic waste.
- Reconfigure the relationship between state agencies and local governments to better reflect statutorily-required shared responsibility for solid waste management.

- Exempt low-population, low-waste counties from procurement requirements.
- Separate edible food recovery from SB 1383 implementation to create an evidence-based initiative to prevent food waste and address hunger, while allowing infrastructure funding to be used for edible food recovery requirements until the law is revised.
- Invest in repairing and upgrading the super-emitter facilities that produce the majority of landfill methane emissions.
- Develop a realistic financing plan based on holistic cost-benefit analysis that is understood by and has the buy-in of Californians.

Recommendation 1: The state should enact a temporary pause on SB 1383 implementation while the recommendations discussed above are implemented.

Recommendation 2: The state should fund an educational campaign that explains to Californians why the SB 1383 requirements are important.

Part II: Conflicting Priorities, Missing Perspectives Resulted in Confusing Regulations

The regulations implementing SB 1383 reflect a regulator caught in between administrative and legislative priorities, the exclusion of the input of the regulated, and the increasing need for a multidisciplinary, multi-departmental approach to rulemaking. At best, the regulations are confusing. At worst, they all but ensure noncompliance, deter investment, and contribute to mistrust in government. The Commission’s recommendations aim to navigate priorities among different branches of government, build multidisciplinary expertise into the rulemaking process, incorporate industry expertise without regulatory capture and recognize the different needs of different communities.

Conflicting Policy Priorities

In order to achieve methane emission reductions, California must do something with the organic waste that is diverted from landfills. The biggest policy clash in SB 1383 implementation is what to do with that waste: The bill’s authors saw renewable natural gas as the logical end-use for organic waste, while the current administration does not.

Procurement Requirements

A market analysis found that there wasn’t enough existing demand for the anticipated organic deluge when SB 1383 is fully implemented;¹⁴ the state’s solution was to create demand by requiring local governments to acquire specific amounts of end products from California-permitted facilities.¹⁵ The amount each local government must obtain is determined by a population- and product-based formula, and local governments can choose any combination – so long as they meet their required amount – of compost, mulch, renewable gas, and electricity from biomass conversion.¹⁶

SB 1383 Promoted Renewable Natural Gas

The language in SB 1383 was clear about the role of renewable natural gas as an end-use for methane. Renewable natural gas is pipeline-quality gas that is interchangeable with conventional natural gas.¹⁷ The legislation directed the California Energy Commission to develop recommendations for the

development and use of renewable gas as part of its 2017 Integrated Energy Policy Report.¹⁸ The bill instructed state agencies to “significantly increase the sustainable production and use of renewable gas, including biomethane and biogas.”¹⁹

The State Prioritizes Zero-Emission Energy

The implementing regulations duly created pathways for renewable natural gas to meet procurement targets. However, other state actions make plain that the state prioritizes zero-emission energy. Notably, Governor Newsom issued an executive order in September 2020 declaring a state goal that 100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035, with a 100 percent goal for medium- and heavy-duty vehicles by 2045.²⁰ “At present, zero-emission vehicle technologies are battery electric vehicles and hydrogen fuel cell electric vehicles,” advises CARB on its webpage.²¹

To implement the executive order, California Air Resources Board developed a rule to speed up the process for government vehicles: In most California counties, half of all new government trucks purchased by 2024 must be zero emission, and all new government truck purchases must be zero emission by 2027,²² or follow a ZEV Milestones schedule that would require garbage trucks to be zero emission by 2039.²³ This matters because many local governments were planning on fueling their waste collection fleet with renewable natural gas to meet their procurement targets. This is especially relevant as zero-emission technology has yet to reach the point where it can cost-effectively power heavy trucks with routes that in some areas can encompass 180 miles per day, witnesses testified.

“It’s a Lot of Mulch”

In addition to wondering how they are going to fuel their heavy fleets, local governments are wondering how they are supposed to meet their procurement requirements. In its February 2018 report on forest management, the Little Hoover Commission outlined the challenges in expanding bioenergy facilities: The energy industry is decentralizing with the expansion of Community Choice Aggregation and communities largely do not choose bioenergy; it’s expensive; it’s not zero emission; and energy companies neither need it nor want it.²⁴

Testifying on behalf of the Rural Counties Environmental Services Joint Powers Authority, Staci Heaton reiterated the political and financial challenges facing biomass-to-energy facilities, then discussed the practicalities of trying to meet the procurement requirements with mulch:

For example, Nevada County has a population of 101,242 and is required annually to procure 5,000 tons of recovered organic waste products, or around 20,000 cubic yards. If you’re a football fan, you can think of that in terms of covering an entire football field with mulch up to the crossbars of the goalposts, which are 10 feet from the ground. In other words, it’s a lot of mulch! It’s especially a lot of mulch if you need to find people to take it off your hands and put it to use in a county where 30% of the acreage is national forest land.²⁵

Hydrogen: An Impractical Solution for 2025

The administration’s answer to how local governments can meet their procurement requirements in lieu of renewable natural gas is hydrogen.

Methane can be converted to hydrogen with zero carbon dioxide emissions if the right process is used and carbon dioxide is captured and stored underground. This is called “blue hydrogen.” The hydrogen then can be used in fuel cells or to store energy.

This is not an established technology, however. In 2022, the Legislature passed a bill requiring the California Air Resources Board to evaluate “the development, deployment, and use of hydrogen” by June 2024.²⁶ In February 2023, the California Energy Commission published a list of barriers to the widespread adoption of low-carbon hydrogen, including:

- Higher production costs than for fossil fuel-derived hydrogen.
- The need to scale up infrastructure and storage capacity.
- No state framework for blending low-carbon hydrogen into existing gas pipelines.
- The potential for fugitive hydrogen emissions.²⁷

The last point is particularly salient considering the purpose of SB 1383 was to combat climate change. Hydrogen is the smallest known molecule, making it easy to escape faulty containment methods. Once in the atmosphere, it extends the life of other greenhouse gases, including methane, by reacting with radicals that otherwise would neutralize greenhouse gases. Over a 10-year period, hydrogen has a global warming effect about 100 times stronger than carbon dioxide.²⁸

Given these factors, it would be unrealistic and unreasonable to expect even the state government to meet the procurement requirements with hydrogen by 2025. Presenting it as a feasible alternative for local governments is setting them up to fail.

Moving the Goalposts

The conflicting directives are seen as moving the goalposts by local governments, testified Ms. Heaton. It makes it difficult, if not impossible, for local governments to determine how to meet their procurement requirements. The state’s changing its priorities also prevents investment from both government and private sector investors. Writing about co-digestion at wastewater treatment plants (WWTP), one market analyst concluded:

...WWTPs cannot typically justify high-risk ventures that come at significant cost to their ratepayers. They are often unable to take on risk associated with a new technology or burdensome requirements for contract lengths, energy production guarantees, or similar contract terms. Furthermore, many communities cannot or will not agree to rate increases for upgrades perceived as unrelated to a WWTP’s core business.²⁹

The goalposts may not be done moving. There is a type of hydrogen called green hydrogen, in which electricity derived from clean renewable energy is used to split water molecules into hydrogen and oxygen: no methane required, no carbon dioxide to capture and store. The oxygen is able to be vented into the atmosphere. The bill discussed earlier that requires the state to evaluate the use of hydrogen, SB 1075, is about green hydrogen. Given Californians’ preference for clean energy, it is not difficult to imagine the future of the state’s hydrogen development centering on green hydrogen, raising the question of what will happen to investments in blue hydrogen.

The Commission does not mean to discourage the development of hydrogen fuel cells and other clean technologies. The Commission does not see it as a viable option, however, for local governments to meet their procurement requirements by 2025.

Recommendation 3: CalEPA, CalRecycle, and CARB should coordinate to prevent conflicting directives on waste processing, and produce consistent and clear guidelines on how to meet statutory and regulatory requirements. Additionally, they should work together and with other state agencies to streamline permitting requirements to construct necessary infrastructure.

Recommendation 4: The Legislature and Governor should require a multidisciplinary team to develop recommendations on how to expand market opportunities for recycled organic waste, and then work to implement those recommendations.

Recommendation 5: The state should reconfigure the relationship between state agencies and local governments to better reflect statutorily-required shared responsibility for solid waste management.

- **The state should expand the list of compliance pathways and products eligible to count toward a jurisdiction's procurement requirements.**
- **The state should allow procurement of California-derived materials processed out of state.**
- **The state should allow woody waste chipped onsite to count toward procurement targets.**
- **Agencies inside and outside of CalEPA should work together to ensure that conflicting needs are addressed.**

In short: The state should build in as much flexibility as possible for local governments to recycle their organic waste, and let communities choose the best options for them.

Recommendation 6: The state should support near-zero emission vehicles until commercially viable zero emission vehicles are available in the waste sector.

Part III: SB 1383 Was Not Designed for Rural California

The legislation and regulations were not designed with rural California in mind. The 26 counties represented by the Rural Counties Environmental Services Joint Powers Authority contribute only 5 percent of the state's organic waste stream,³⁰ raising the question of whether the environmental and financial costs of complying with SB 1383 outweigh the benefits.

The regulations require most jurisdictions to create curbside organics recycling programs, but many rural communities lack curbside trash pickup (or curbs) and paved roads that can accommodate heavy garbage trucks. Instead, residents self-haul their refuse to local transfer stations. There are few organics recycling facilities near rural communities, and the closest ones may lie outside of state borders, and therefore are unlikely to be licensed under a California permit as regulations require. Many rural jurisdictions are located in rugged terrain that lowers fuel efficiency and for which electric batteries cannot yet accommodate, and experience extreme temperatures and weather events that can close roads seasonally. Many rural communities also have to contend with permanent wildlife populations for which leaving food waste curbside can lead to catastrophic consequences for both humans and wildlife.

The state has created limited temporary waivers for counties with less than 70,000 people; unincorporated census tracts with a population density of less than 50 people per square mile; jurisdictions with fewer than 7,500 people and that disposed of less than 5,000 tons of solid waste in

2014; and census tracts above 4,500. Most of these waivers only exempt eligible communities from parts of the requirements, and only for a few years.³¹

The timeline required by SB 1383 and the estimated costs of implementation did not account for planning, permitting, and constructing new roads or paving existing roads to accommodate collection vehicles across the Sierra Nevada or Mojave Desert. Compliance means so much more for rural Californians than simply adding organic waste pickup to already-existing trash and recycling pickup.

Recommendation 7: The state should permanently exempt counties that produce less than 200,000 tons per year of waste from SB 1383 requirements, including edible food recovery, except to provide options at self-haul facilities for residents to separate their organic waste from their trash.

Part IV: Missing Community-Centered Response

California communities have other needs that that can be better accommodated by a community-centered response to organic waste. One such solution is community composting. Community composting keeps the value-added product, compost, in the community where the waste originated, benefiting residents who garden. It employs members of the community. It provides teaching opportunities to local schoolchildren to instill environmentally-friendly habits in them at a young age.

There are myriad benefits to keeping organic waste hyperlocal. There are the obvious environmental benefits: It reduces the amount of waste that must be transported long distances by heavy, low-mileage vehicles. The Commission learned about community composting efforts accessible by foot or bicycle, the cleanest method of waste collection.

It is a step toward equalizing the burden of solid waste; landfills and waste processing facilities – even the ones transforming organic waste into useful products – historically have been located such that waste typically flows from wealthier communities to lower-income communities. The state should be doing all it can to create a waste management system where, for example, Malibu’s waste stays in Malibu.

There are few reasons for state and local governments *not* to encourage these community efforts. However, entrepreneurs who try to create a business model from it report legal obstacles because waste technically belongs to the hauler who has the contract for the region – and one-person operations cannot, nor desire to, compete with multinational companies in bidding for contracts. Residents who choose to pay for the hyperlocal approach still have to pay for their jurisdiction’s mandatory organic waste pickup. Even volunteers working to establish drop-off locations in community locations report reticence to use public land for this purpose.³²

Currently, the state’s incentives are backward for the environmental result it wants to achieve. The Commission recommends carving out space for community organic waste recycling. This means reclassifying those who pick up organic waste on a small scale as something other than a hauler and designing regulations appropriate to the niche they fill. The state should consider a tax credit or some other financial incentive to ease the burden for those who pay a community provider to collect their organic waste. The state should create opportunities for community composting in state parks where practical, as well as incentives for local governments to allow public land to be used for the same purpose. Nonprofit organizations running community composting operations exist on a shoestring

budget, so the state should take steps to ensure grant funding they receive is distributed in as short a timeframe as possible.

Recommendation 8: The state should embrace a concept of keeping waste local, and allow communities to be innovative with organic waste solutions.

- **The state should reclassify community composters and develop regulations targeted to their end product.**
- **The state should legally protect community compost operations by encouraging jurisdictions to develop contracts or carve-outs in franchise agreements for community composting.**
- **The state should provide a tax credit or other incentive to households that use community composters while also being subscribed to their jurisdiction’s collection service.**
- **The state should expand regulatory permissions to allow community composting in parks.**
- **The state should expand funding opportunities to community-based composters and shorten the post-award processing time.**

Part V: Missing Industry Expertise

Many industry experts discussed regulations and decisions that did not make sense from an operational perspective or did not meet best practices. Sampling regulations, for example, are expensive and, as written, will not obtain a representative sample of the waste, study participants told the Commission.³³ The definitions for compost feedstock, the Commission heard, create poor quality and unsaleable compost. One example: Carpet technically is defined as compostable, but it has been decades since organic carpet was in widespread use, and composting facilities do not want the synthetic product that most people have.³⁴

Industry insiders said the in-state processing requirements and lack of geographic consideration hurts them, as rural waivers mostly apply to collection and not the processing requirements. Hauling organic waste to the nearest composting site, one Sierra Nevada facility operator told the Commission, is a 200-mile roundtrip journey that includes a 10,000 foot vertical hill climb in a truck that gets 4.2 mpg. Not only does this increase his company’s operating expenses, he said, but these heavy vehicles emit more at altitude.³⁵

In order to be compliant with regulations, organic waste must be sent to facilities that can achieve a 75 percent organics recovery rate from a mixed waste stream. Industry officials say this is unrealistic in most facilities; the average recovery rate in 2020 was 42 percent, according to CalRecycle.³⁶ Further, study participants said, this requirement deters investment because if, for example, a facility only achieves a 70 percent recovery rate, jurisdictions won’t be allowed to send organic waste to them, and that’s a risk many investors do not want to take.³⁷

In short, study participants argued, a lack of familiarity with the operations of the facilities processing California’s waste resulted in some regulations that aren’t workable and can even be at cross-purposes with the state’s goals.

California previously has proven that it can lead the world on environmental concerns, and the Commission sees the potential for CalRecycle to become an international leader in solid waste management. It needs to build into its organizational culture at all levels familiarity with the industry,

within California and the United States as well as abroad. The Commission is sensitive to the need to prevent agency capture, so it is recommending short-term interactions such as externships. Companies have indicated to the Commission that they would be happy to participate in such endeavors.

Naturally, the new ideas encountered and shared during these information exchanges would result in new regulations. To ensure feasibility, the proposed regulations should be field-tested in advance to the extent possible.

Recommendation 9: The state should position CalRecycle as an international expert and leader in solid waste management by facilitating exchange visits with other countries, externships inside and outside of government, and field-testing the regulations it proposes from these knowledge exchanges.

Part VI: Edible Food Recovery

On their face, the edible food recovery requirements sound like a great idea: Reduce landfill methane emissions and feed the hungry. However, while much is made of the fact that organic waste comprises more than a third – 35 percent – of the state’s waste stream, food comprises about 15 percent of municipal waste streams. And, according to the state’s own studies, slightly less than 3 percent of that food waste is potentially donatable: The rest is unfit for human consumption.³⁸

The food bank model is not to collect leftover food from local businesses. Food banks work with growers and manufacturers to obtain large amounts of food either as a donation or at wholesale prices. The food banks then deal with the logistics of transportation, warehousing, and distribution to individual food pantries, which distribute food to community members. A significant percentage of these community members are children; children comprise nearly half of food insecure people in California.³⁹ So in addition to ensuring the right food is available where and when it is needed, food banks are concerned with food safety and a nutritious diet for the most vulnerable Californians. Day old-croissants from a chain restaurant don’t fit that bill, yet food banks are expected to expand their operations and the way they do business to help local governments follow the law. Again, the Commission wonders if this is the most effective use of taxpayer dollars, and there is no cost-benefit analysis to provide answers.

The Commission recommends the state create an interagency or independent environmental analysis unit that can provide policymakers with vital information across multiple sectors of the state’s environment and economy to inform decision-making. If woody waste burned in bioenergy facilities is prohibited from counting toward procurement requirements, for example, what are the consequences to the state’s forest health initiatives if local governments quite reasonably switch to activities that do count toward their organics procurement requirements?

The annual greenhouse gas emissions anticipated to be saved when SB 1383 is fully implemented may be equivalent to removing 3 million cars from the road, but California’s wildfire emissions in 2020 alone were equivalent to adding more than 24 million cars on the road for a year.⁴⁰ Should that information impact how California incentivizes what type of organic waste is burned in bioenergy facilities? The Commission believes good policymaking depends on it.

The Commission urges to the state to conduct a comprehensive analysis of the edible food recovery requirements. If so, is the state’s model the most effective way to redistribute food?

Finally, the Commission urges the state to go after the low-hanging fruit: Fix the 32 super-emitters and monitor them to ensure they stay compliant.

Recommendation 10: The state should separate edible food recovery from SB 1383 implementation. It should conduct studies to better understand from where the edible waste is being initiated. Once that factor is understood, it should create incentives for bottom-up solutions to prevent food waste and distribute unused food to the hungry in ways that meet communities' needs instead of imposing top-down solutions. Until that happens, the state should consider infrastructure to meet current edible food recovery requirements as eligible for SB 1383 infrastructure funding.

Part VII: Landfill Methane Emissions

Aside from setting a goal of reducing methane emissions by 40 percent below 2013 levels as part of a suite of other goals to reduce short-lived climate pollutants, and the 20 percent edible food recovery requirement, SB 1383 did not identify measurable outcomes or the role it expected landfill diversion and livestock operations to play in achieve those goals.

The assumptions underlying SB 1383 appear to be that decomposing organics create methane; landfills are a leading contributor to the state's methane inventory; therefore, diverting organics out of landfills will reduce the state's methane emissions.

It's not that simple, however, and digging into landfill data reveals nuance that needs to be addressed.

First, it is true that landfills are by far the largest point source of methane emissions in California.⁴¹ A point source refers to a non-moving origin of emissions, whereas a mobile source refers to a moving origin, such as a vehicle or gas-powered leaf blower. Clusters of point sources with emissions too small to measure individually, such as gas stations, but that combined create a measurable effect are referred to as nonpoint or area sources.

In fact, a three-year survey of the state's point source methane emissions conduct by NASA's Jet Propulsion Laboratory (JPL), CARB, and the California Energy Commission revealed that the U.S. Environmental Protection Agency's methodology that previously had been in use to estimate methane emissions had underestimated those from the solid waste industry. Some facilities were leaking at levels six times the estimates afforded by the federal government's measure.⁴²

However, the survey also revealed that a small number of facilities were responsible for nearly half of landfill methane emissions. The researchers surveyed 436 landfills and composting facilities, and found persistent methane plumes from 32 of them: 30 landfills and two composting facilities.⁴³ These super-emitters, as they're colloquially called, were responsible for 41 percent of landfill emissions.⁴⁴ Alone, they were responsible for 20 percent of CARB's total 2016 methane inventory.⁴⁵

The Commission would like to see the data indicating that the best environmental benefits the state can achieve with \$40 billion come from rural Nevada County having an organic waste collection program instead of, for example, fixing the super-emitters. Addressing those 32 facilities creating 20 percent of the state's methane inventory would help the state make significant progress toward its goal of a 40 percent methane reduction.

The Commission also notes that two of the super-emitters were composting facilities. Without understanding and addressing the causes of the methane leaks at the composting facilities, how can the state be sure that diverting even more organic waste to composting facilities will decrease methane emissions?

Recommendation 11: The state should help lower landfill methane emissions by fixing the small proportion of super-emitters that produce the majority of emissions.

- **The state should permanently fund satellites to monitor greenhouse gas emissions and integrate the findings from that data into its strategic planning for climate change adaptation.**

Part VIII: The Legislation Did Not Include Sufficient Resources for Implementation

The Legislature’s analysis of SB 1383 estimated the fiscal effect to be “potentially in the tens of millions of dollars or more” due to unknown cost pressures for programs to implement the strategies.⁴⁶

The estimated price tag over an 11-year period is \$40 billion. The state has dedicated \$60 million in competitive grants to the soft costs of implementation, such as creating edible food recovery programs and buying bins. Four hundred and seventy jurisdictions applied for that funding. It also made \$100 million in competitive grants available for hard infrastructure costs, such as building facilities.

Beyond the \$160 million, however, the burden falls to ratepayers. Yes, the state hopes to attract private investment to cover some of the \$40 billion, but investors will recoup their investment by charging for the services they provide, putting ratepayers on the hook again.

Regulations Exclude Some Existing Infrastructure

Given the hefty price tag attached to implementing the legislation, government officials expressed surprise that the regulations *de facto* excluded some existing infrastructure from counting toward procurement targets: wastewater co-digestion plants that already are converting methane into renewable natural gas.

The Los Angeles County Sanitation Districts testified that they have the infrastructure, expertise, and desire to process organic waste through their wastewater facilities, though they would need to scale up to meet the anticipated supply of organic waste. However, they cannot source their feedstock from facilities that meet the 75 percent organic waste requirement discussed earlier in the report, which means the renewable natural gas they produce doesn’t “count.” This effectively removes their infrastructure from the available pool to process organic waste – a problem when the state already lacks the capacity to process 45 percent of the organic waste it has mandated to be diverted.⁴⁷

Procurement Requirements Represent Unfunded Mandate

Many stakeholders questioned whether the procurement requirements were an unfunded mandate. The state claims it is not, because local governments theoretically can obtain these products without buying them from an outside organization. CalRecycle’s website advises:

Procurement does not necessarily mean that products must be purchased. Jurisdictions that own an organics recovery facility can procure end products for city and county use without a financial transaction. A jurisdiction may also acquire products in another way, such as free delivery or distribution of products from a hauler, and subsequently use or donate those products to meet its procurement target.⁴⁸

This is a somewhat disingenuous read of the procurement requirements. Local governments with the ability to produce these products themselves will have to scale up to process an increased supply of organic waste. This will require investment in land, facilities, machinery, and labor, and it is difficult to see how local governments could secure these additional resources, presumably adhering to wage and hour laws and health and safety codes, without financial transactions. As for local governments without the capacity to produce these products: The Commission heard from many industry officials during its study process, but did not encounter any with a business model based on helping local governments meet their procurement targets for free.

Other Financial Concerns

There are other financial oversights accompanying SB 1383. Currently, food banks are ineligible for infrastructure funding despite their need to expand operations.

The legislation made CalRecycle responsible for oversight of an additional \$40 billion' worth of facilities and operations, plus significant enforcement and outreach activities, and increased their grant portfolio by \$160 million, all without supplying the agency with additional staff members. Already the department has had to move half of its local assistance team to enforcement in order to meet its statutory obligations.⁴⁹ Good governance requires sufficient staffing.

Finally, providing financial assistance via competitive grants hurts those who need the assistance the most: the smaller and less-resourced local governments who cannot afford grant writers.

There is too much at stake for the state to not have a solid financial plan to implement SB 1383. It should use the pause the Commission recommends in Recommendation 1 to develop a financial plan to implement the legislation and clearly communicate what that plan will cost, who will pay it, and what Californians will receive in return.

Recommendation 12: The state should conduct the holistic cost-benefit analyses discussed in this report, determine measurable outcomes, the costs to achieve those outcomes, and an outline of who will pay, and how, to meet those costs, and be transparent with Californians about what it is asking from them and what they will receive in return.

- **The Office of the Governor should ensure that the state's financial experts across state government weigh in on the realistic costs of the strategy's implementation.**
- **The state must give its agencies the necessary resources, including administrative resources, to successfully implement the changes the law requires.**
- **The state should not rely on competitive grants to meet basic requirements. Competitive grants redirect resources away from implementation and into competing. Additionally, they disadvantages less-resourced jurisdictions, which are the very ones that most need financial assistance.**

- **If private sector investment is part of the financial plan, then:**
 - **Be clear with Californians about what kind of returns these investors will expect, and who will pay for them, e.g. ratepayers, and what burden that will put on them.**
 - **Investors need stability and to know the rules won't change mid-stream, so the state must commit to using the facilities in which they invest.**
 - **The state must create regulations that attract private investment and allow for reasonable profit. If there are benefits the state wants to achieve that cannot be achieved with market incentives, then don't plan on private investment in those areas.**

Text Box 1: What Can Be Done with Organic Waste?

Organic waste can be used to create many useful products, including transportation fuel, electricity, compost, and mulch. California regulations currently allow the following four uses for diverted organic waste:

Anaerobic Digestion: In anaerobic digestion, microorganisms break down organic waste in an oxygen-free environment. This creates digestate, a solid material that can be composted, and biogas, which can be used to produce electricity, heat, and low-carbon transportation fuel, notably compressed renewable natural gas. Anaerobic digesters are expensive and require maintenance and monitoring to prevent leaks, and the facilities must compost or otherwise dispose of the digestate.

Biomass Electricity Production: California's biomass energy plants primarily process woody and agricultural waste, and could service similar materials diverted from landfills. In this method of electricity generation, the organic material is converted into steam, which is then transferred into electricity.⁵⁰ Some biomass electricity facilities also use the steam to create heat.

Two large hurdles currently hinder widespread adoption of this electricity production model. One is that California's biomass processing capacity is shrinking. The state could produce more than 800 megawatts (MW) of electricity from 66 facilities during biomass electricity's heyday in the early 1990s.⁵¹ Largely due to the end of government price supports in 1996, the state's production output has fallen to approximately 600 to 650 MW annually from 25 facilities, or 2.9 percent of the state's electrical generation capacity.⁵² The other hurdle is the state's turn toward zero-emission energy sources, discussed in further detail in the report.

Composting: California employs two methods for large-scale composting. About three-quarters of facilities use aerated windrow composting, in which organic waste is arranged into long rows and then aerated by mechanically turning the organic matter. Oxygen controls the temperature, kills pathogens, and speeds up the decomposition process. This type of composting requires large tracts of land, making it particularly expensive in California.

The other common method is aerated static pile composting, in which pipes pump oxygen into piles of organic matter. Organic matter can be piled into high vertical mounds instead of long horizontal rows, thus requiring less land than the other method. However, it requires more technology and careful monitoring than windrow composting, which raises costs. In both methods, naturally occurring microbes

break down the organic waste into carbon dioxide, leachate, minerals, and stabilized organic matter, which we call compost.

Mulching: Mulch is material spread on the ground to protect or enrich soil. It can be made from many materials, including some that are inorganic. Commonly-used mulches are made from compost, forest waste, and landscape trimmings. Mulch is made by chipping and/or grinding this material into the desired size and density; some mulches are sterilized to prevent the spread of insects and disease.

Text Box 2: Methane Reduction Matters

Carbon dioxide has long starred as the greenhouse gas receiving the most attention from California policymakers, and for good reason. Alone, it contributes approximately half of the greenhouse gases contributing to climate change and remains in the atmosphere for hundreds of years. We have to reduce carbon emissions in order for our children and grandchildren to have a livable planet. Unfortunately, reductions in carbon emissions will not effect immediate results in slowing and reversing climate change. For that, we must reduce short-lived climate pollutants, meaning gasses and particulate matter that live in the atmosphere for fewer than 20 years. Combined, these pollutants constitute the other half of greenhouse gas emissions contributing to climate change.

Even though methane remains in the atmosphere for only about 12 years, scientists consider it to be the worst contributor to climate change among short-lived pollutants. This is because methane is especially efficient at absorbing radiation (sunlight) and converting it to heat. In a 20-year timespan, one ton of methane will absorb and convert the same amount of energy as 75 tons of carbon dioxide. This highlights the importance of reducing methane to see short-term effects in climate change reversal. Finally, methane reacts with other pollutants in the atmosphere to create another climate pollutant, tropospheric ozone, which impairs the ability of plants to sequester carbon dioxide.

Text Box 3: The Potential of Satellite Monitoring

California is partnering with scientific, academic, and charitable institutions to deploy satellites to find and measure methane and carbon dioxide emissions and leaks, as well as 25 other environmental indicators.⁵³

Carbon Mapper, a nonprofit devoted to accelerating reductions in methane and carbon dioxide emissions, will launch two satellites in 2023, with a full constellation of satellites expected to be in place by the end of 2025.⁵⁴ The goal is to be able to pinpoint methane and carbon dioxide emissions at the facility level in order to rapidly address leaks and better understand the sources and scale of these emissions.⁵⁵ Additionally, this data should yield useful information to help policymakers make greenhouse gas reduction and climate change decisions, as well as influence new technology and strategies to combat emissions.⁵⁶ The data from this monitoring program will be made publicly available at no cost.

This initiative is California's first foray into using "homegrown satellites," as described by Governor Newsom,⁵⁷ to combat climate change. The state joins a growing international effort to use satellites to monitor and reverse climate change. Methane, carbon dioxide, and the other 25 environmental

indicators represent only a small fraction of information this technology can provide. Other countries are using satellite monitoring to reduce fuel emissions from vehicles, ships, and trains by optimizing when and how trips are made.⁵⁸ They're tracking changes in forest and wildland ecosystems, ice and permafrost, and soil health.⁵⁹ They are incorporating satellites into early-warning systems for extreme events and improved forecasting models.⁶⁰ The possibilities for California to improve its natural resource and environmental health via satellite monitoring are promising.

Even with the latest technology and the brightest minds to analyze the data, there still is one catch to satellite monitoring, scientists say: It's useless without leaders willing to act on the information collected. The full promise of satellite monitoring depends on Californians' willingness to adapt to the lessons we learn from the data.

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