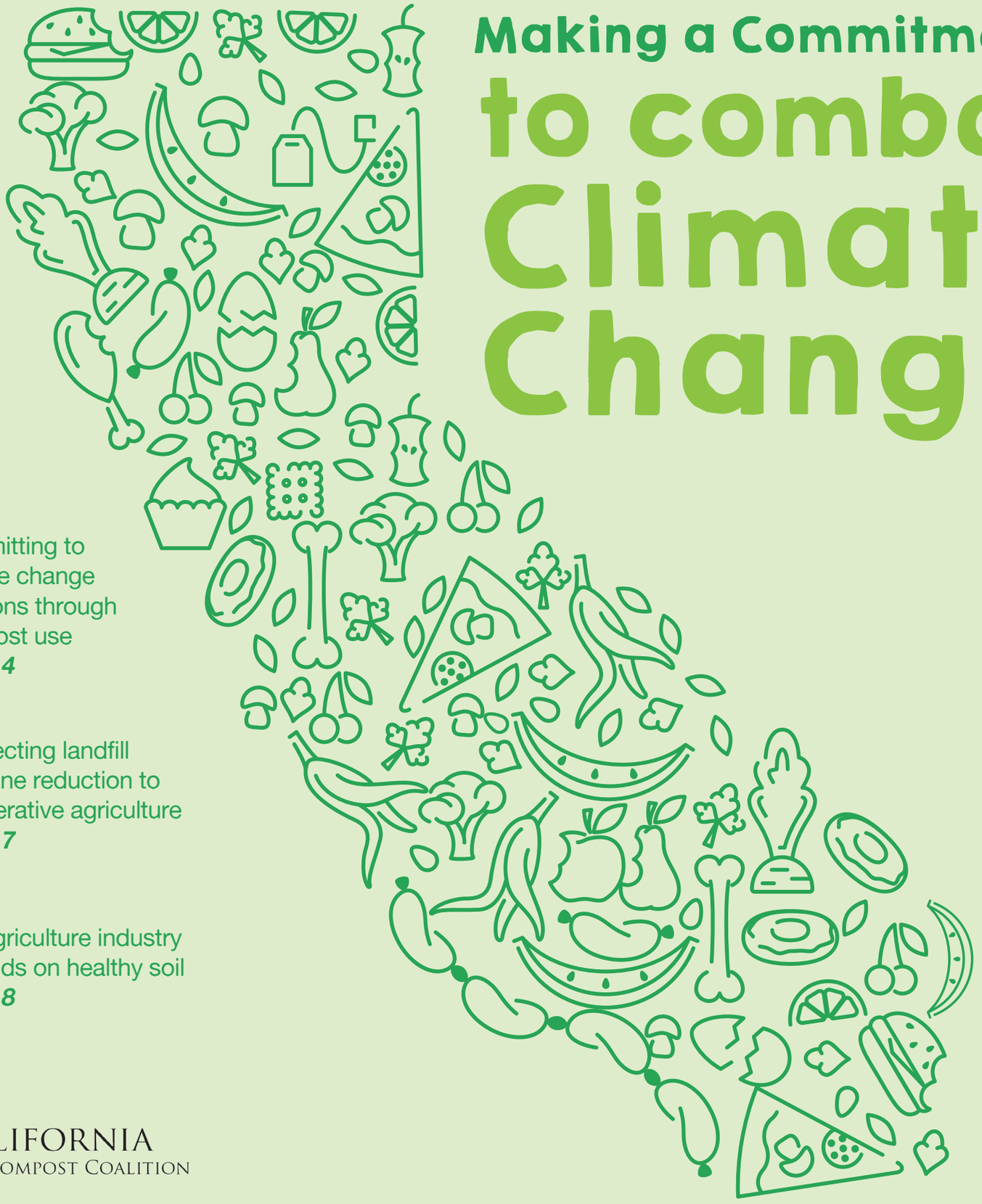
Making a Commitment to combat Climate Change



CALIFORNIA
COMPOST COALITION

The Compost and Climate Connection

BY ALLEN PIERLEONI

As more organic waste is transformed into soil-enriching compost, California's farmers reap the benefits

As the effects of climate change become more visible, and the sense of urgency to curtail it increases, the idea of a "circular economy" is becoming less of a concept and more of a reality.

This regenerative approach is a sea-change from the traditional "take, make and dispose" model of manufacture and consumerism, more focused on a repair, re-use and recycle mindset. The goal is to eliminate all waste — organic and man-made — and decrease dependence on raw materials. Ultimately, it can stimulate fiscal growth through job creation and innovation.

"The basic premise is that all manufactured and produced goods are reutilized," said Neil Edgar, executive director with California Compost Coalition. "Organic waste diversion from landfills is the driver for necessary climate change."

Key to alleviating the devastating impacts of climate change are legislative mandates. Impactful mandates increase organic-waste recycling and subsequently reduce the greenhouse gases that contribute to global warming.

> **"Organic waste diversion from landfills is the driver for necessary climate change."**
>
> **Neil Edgar**
> ***Executive Director***
> ***California Compost Coalition***

For instance, California's SB 1383, in law since 2016, strives to cut organic waste in half by 2020, and by 75 percent by 2025. About 10 million tons of California's organic waste are recycled yearly; that number is required to double by 2025.

That's of potential benefit to the state's 70,000-plus farmers and ranchers, since much of that waste is decomposed and processed into compost.

Applied to fields and pastures, compost enriches soil with microorganisms, increases crop yields, bolsters water retention (saving money on irrigation), reduces erosion and promotes carbon sequestration.

With more recycled organic waste in our future, there will be more compost available than ever, said Christy Pestoni, northern district president of the California Refuse Recycling Council, Northern Division.

"The price will come down and we'll need new outlets for it," she said. "To encourage that, we offer credits to farmers, and the California Department of Food and Agriculture offers incentives to use it through its Healthy Soils Program. We need more of those."

Pestoni also calls on Caltrans and individual cities and counties (and home gardeners) to use compost in their landscaping programs. "Everyone needs to own a piece of the situation and join us on this journey of sustainability," she said.

DRIVERS FOR CHANGE

New laws are altering the dynamics of how we must approach organic-waste disposal and recycling

1

REDUCING METHANE

California has always led the nation in environmental regulations intended to lighten our carbon footprint and safeguard human health. One definitive piece of legislation is SB 1383, which, among other goals, requires a 40% reduction of methane emissions, a "short-lived climate pollutant" and byproduct of organic-waste decomposition in landfills. Methane and other pollutants are responsible for about 45% of global warming, scientists say. Methane is 84 times more harmful to the atmosphere than carbon dioxide.

2

BUILDING INFRASTRUCTURE

Senate Bill 1383 mandates cutting organic waste in landfills in half by 2020, and by 75% by 2025. That means a dramatic increase in waste removal and recycling, requiring more infrastructure to process it. Additionally, it means overcoming obstacles related to locating infrastructure sites, acquiring permits and adhering to the CEQA statute.

The target is to recycle 20 million tons of organic waste and double the amount now being processed at 170 statewide organic-recycling centers. The state projects the need for 50 to 100 new or enlarged facilities by 2025 at an estimated cost of $2 to $3 billion.

3

INCREASING COMPOSTING

One end result of recycling organic waste is compost, the decomposed bio-matter so beneficial to soil and farming operations. A growing number of conventional farmers are using it in place of chemical fertilizer, yet it's most often reserved for high-value crops such as grapes and nuts.

To broaden the use of compost, soil scientists suggest emphasizing compost's money-saving qualities, offering farmers' incentives supported by cap and trade money, and promoting special projects such as the Healthy Soils Program at the California Department of Food and Agriculture.

Beyond the Harvest

California's $50 billion agricultural industry depends on healthy soil

BY ALLEN PIERLEONI

Californians benefit from the agricultural cornucopia that surrounds us. Today, its 70,000 farms and ranches produce 400 commodities (the most of any state), from dairy and beef to grapes and almonds.

California supplies two-thirds of the nation's fruits and nuts and a third of its vegetables. Its productive soils and rare Mediterranean climate combine to make agriculture a $50 billion industry, the largest in the U.S.

Still, as crop soil is depleted with use, so is its capacity for crop yield. That's why maintaining soil health is such an essential ingredient in sustaining California's agricultural juggernaut.

Fourth-generation farmer Connor Chooljian has become a "true believer" in the benefits of composting, especially since receiving a financial incentive grant from the Healthy Soils Program, administered by the California Department of Food and Agriculture.

"I was more into liquid fertilizer until a few years ago," said Chooljian, farm manager for Del Rey Packing Co. near Fresno. The farm grows multiple varieties of grapes for raisins, and has been in his family since 1929.

Composting and cover-cropping "greatly benefited everything — the vineyards, the soil, the irrigation," he said. "Everything is intermingled, but it all starts in the soil. Healthy soil equals healthy plants equals higher tonnage [of grapes]."

> **"It all starts in the soil. Healthy soil equals healthy plants equals higher tonnage [of grapes]."**
>
> Connor Chooljian
> *Farm manager,*
> *Del Rey Packing Co.*

Connor Chooljian values the role of compost in his farming business.
PHOTO BY CLAIRE TAKAHASHI

Second-generation farmer Leo Speth runs a young 40-acre walnut orchard in Colusa County in the Central Valley. His latest harvest — only the third — produced 2,900 pounds per acre, but he's expecting bigger yields as he moves to more composting and cover-cropping. "Production is increasing each year," he said.

Though he does rely on some inorganic materials for fertilization and insect control, "the use of compost is weaning me away from that," he said.

Speth applies "at least four tons of compost to the acre" in conjunction with cover crops of legumes, grasses and cereals "to put more organic matter and nitrogen into the soil," he said. He's noticed benefits from his composting-cover-cropping program. "Tree and root health develop more rapidly and water penetration is increased because the soil is more porous."

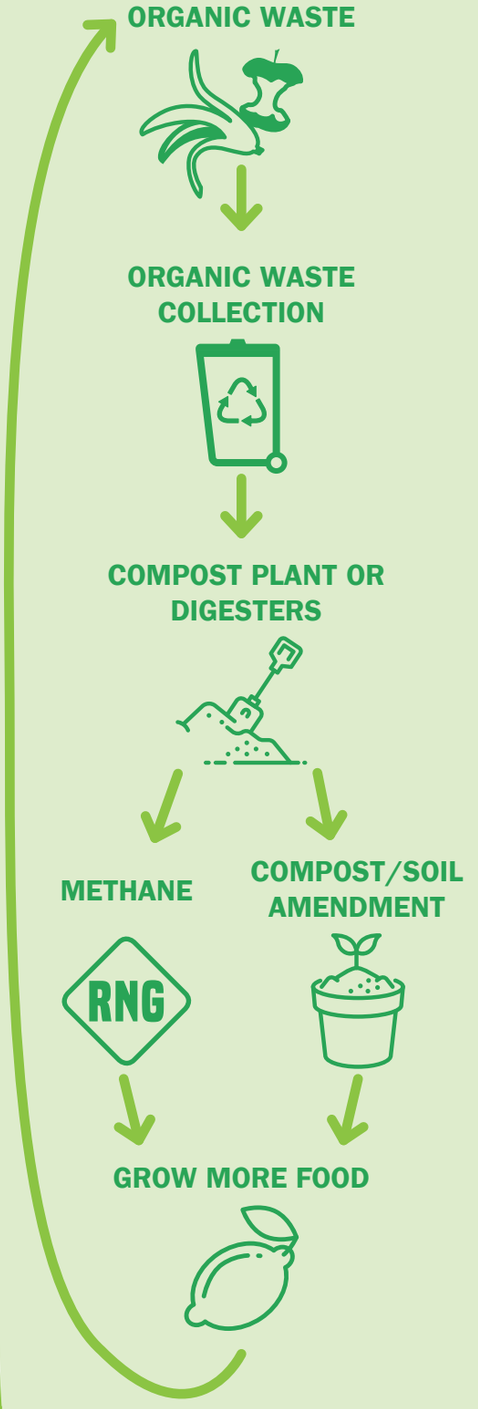
Soil scientist and educator Will Bakx sees composting as "vital to farming," but it is also a proponent of changing the farming model to one that's done "in a more regenerative way," he said. Bakx is the principal of Renewable Sonoma and owner of Sonoma Compost Co.

"Conventional agriculture can be extractive," he said. "It can use up the minerals and organic matter in the soil and have to rely on external inputs."

The ideal regenerative approach envisions a farm as "working in harmony with everything around it — the plants, the soil, the insects, the birds. It helps create wildlife habitat. The focus is to build an ecosystem that will support itself without fertilizer, pesticides or herbicides." Composting is the cornerstone of such an approach.

CLOSING THE LOOP

Organics recycling provides an opportunity to "close the loop" and provide a sustainable way to reuse compostable plastics, food waste and yard trimmings to grow more food.



The Environmental Benefits of Compost

Composting saves irrigation water and protects groundwater from nitrates

BY ALLEN PIERLEONI

When it comes to taking out the trash, the United States leads the world in wastefulness.

We generate more than 262 million tons of municipal solid waste each year, recycling about 68 million tons of it but composting less than 24 million tons, said the Environmental Protection Agency.

Yet compost — a natural fertilizer derived from decomposed organic matter — is playing an increasingly vital role in California's agricultural industry as climate change threatens the food chain, endangers water supplies and imperils public health.

In the fields and pastures, compost retains moisture and slows evaporation — thus saving water — adds nutrients and microorganisms to the soil, fosters plant health and growth, and sequesters carbon. It also helps prevent nitrates from leaching into and accumulating in groundwater.

"Compost is like a multivitamin. Your body will be healthier and more resistant to issues if you use it on an ongoing basis," said Bill Camarillo, CEO of Agromin. The Oxnard-based company transforms more than 6,000,000 tons of organic material into soil amendments each year, including compost.

"By putting soil organic matter like compost in the ground, it helps the soil be more healthy, which in turn creates a healthier environment for plants," Camarillo shared. Further, he shared that compost ultimately saves money in irrigation and fertilizer costs, and earns profits by increasing crop yields.

As Camarillo travels on business throughout California, he commonly finds farm soils with less than a half-percent of organic matter in them.

> **"Compost is like a multivitamin. Your body will be healthier and more resistant to issues if you use it on an ongoing basis."**
>
> **Bill Camarillo**
> ***Agromin, CEO***

"For the soil to operate optimally, the number needs to be 3 to 4%," he said.

"Healthy soil allows farmers to use less herbicide and pesticide, but many of them have become accustomed to the instant response of chemicals instead of treating things holistically and over time. Chemicals end up in the water table, in the air and in the soil," he said.

Because of high operating costs, low profit margins and year-to-year variability, farmers too often leave soil improvement at the bottom of their budgets, Camarillo said. "How well their crops do the previous year will determine how much they'll be willing to invest in their soil. Some harvests are better than others, and the economy fluctuates. In the end, money is driving behavior."

Ultimately, so is climate change, said Jeanne Merrill, policy director for the California Climate & Agriculture Network, based in Sebastopol. It's a coalition of sustainable agriculture and farmer-member groups.

"We work to secure resources for farmers to address climate change and be part of the solution," she said. "Our members are living with it every day, having to adapt and change. We want to make sure there's a resilient farming system in place."

Camarillo added, "We need to help educate the public that this is not an option, and we need their help to get it done. It's a heavy lift."

MORE SOIL ORGANIC MATTER MEANS MORE MOISTURE

In farming, "soil water-holding capacity" is a crucial consideration. Soils act like sponges for water, and the healthier the soil, the more water they can absorb and hold**.** The more water soils can absorb and store, the less farmers have to irrigate, making them more resilient to droughts.

Soil organic content plays a key role in holding moisture, which is why compost — which naturally retains moisture and retards evaporation — is a valued amendment to soil.

The general rule is: Increase the amount of organic matter in the soil, and the soil water-holding capacity will rise. For instance, the University of California Department of Agriculture and Natural Resource said that a 5% increase in soil organic matter "quadruples a soil's water-holding capacity." The USDA Natural Resources Conservation Service estimates that on average a 1% increase in soil organic matter increases soil water holding capacity by 250,000 gallons.

SB 1383 REQUIREMENTS TIMELINE

2020

50% reduction in landfilled organic waste
(11.5 million tons of organic waste disposal allowed)

2022

Regulations take effect and state enforcement begins

2025

75% reduction in landfilled organic waste
(5.7 million tons of organic waste disposal allowed)

2025

20% increase in recovery of currently disposed edible food

Doug Button stands in front of the vast array of machinery that transforms household waste into renewable natural energy.
PHOTO BY GEORGE E. BAKER, JR.

Harnessing Waste as Renewable Fuel

Organic waste can be put to good use outside of landfills

BY ANNE STOKES

One person's trash can be another's treasure — literally! — when it comes to California's organic waste. Diverting food and green waste away from landfills and into recycling facilities prevents millions of metric tons of greenhouse emissions from polluting the environment. It can also produce renewable natural gas (RNG), a clean energy source that can replace the use of some fossil fuels.

The Blue Line Transfer Station transforms South San Francisco's organic waste into approximately 300 to 500 diesel gallon equivalents of RNG a day, enough to power a portion of their waste collection fleet.

"It's a win-win," said Doug Button, president of the South San Francisco Scavenger Company. "That's a word that a lot of people use, but it's good for us, it's good for customers and it's good for the environment."

When organic material decomposes in landfills, it emits methane, a potent greenhouse gas. However, when recycled at an anaerobic digestion facility like Blue Line Transfer Station, those same emissions are captured rather than released into the environment. They are then refined and can be fed back into a community's energy grid or used to fuel the trucks that collected the materials from homes and businesses.

"It's a closed-loop system," Button explained. "I tell people it's like 'Back to the Future,' where you put the banana peel in and you're running your truck on it a couple days later."

> **"It's a win-win . . . it's good for us, it's good for customers and it's good for the environment."**
>
> **Doug Button**
> ***President, South San Francisco Scavenger Company***

Anaerobic digestion (AD) facilities help communities meet California's SB 1383 requirements — which includes a 75% reduction of organic waste in landfills by 2025 in order to curb greenhouse gas emissions. According to the California Compost Coalition, complying with those standards will require 50 to 100 facilities, which will not be exclusive to composting and anaerobic digestion facilities. They estimate these facilities will be able to produce 74 million diesel gallon equivalents of RNG a year, as well as increased jobs and in-state energy.

"All of these gases are out there, they're going to be made," said Button. "Why contribute to a problem when you can be using it to power trucks?"

While Blue Line Transfer Station shows anaerobic digestion is a viable solution in reducing organic waste in landfills, preventing greenhouse gas emissions, and providing clean renewable energy, there are barriers to implementing more programs throughout the state. Cost is a common concern. While Button admits that such facilities can be expensive to build and operate, they're a good long-term investment.

"A lot of communities have a garbage collection company and they're always looking for the cheapest price," he said. "If a community is only looking at the cost, sometimes it's cheaper to use fuel like diesel, but environmentally is that the right thing to do? I don't think so."

POWER IN NUMBERS

One of the world's largest anaerobic digestion facilities is right here in California. Zero Waste Energy Development Company's facility, located in San Jose, is one of the country's first large-scale facilities to harness organic waste to produce clean, renewable energy.

"In order to have healthy communities, it is essential to implement alternative systems that are diverting materials from landfills," said Michael Gross, director of sustainability. "Large-scale composting programs will be a big part of the solution in diverting these materials from landfills and reducing greenhouse gas emissions."

THE FACILITY IN SAN JOSE

- ✔ **Produces 1.6 Megawatts per hour,** enough to power 1,400 homes.
- ✔ Processes **90,00 tons of food waste per year,** diverting 65% of organic waste materials away from landfills.
- ✔ **Prevents 21,600 metric tons of carbon dioxide equivalent** from being released into the environment — equivalent to leaving 50,000 barrels of oil in the ground.

COMPOSTING HELPS FEED PEOPLE AND ANIMALS

California landfills take in **40 million tons of waste annually**, two-thirds of which is organic waste.

18% — 6 million tons — of organic waste is food, which could be composted or recycled rather than take up space in landfills.

Decomposing organic waste in landfills produces **methane**, a potent greenhouse gas. Even efficient landfills only capture 50-80% of methane produced. Fugitive emissions contribute **21% of California's total methane emissions.**

Compostable materials include:

- ✔ Food scraps like vegetables, fruits, coffee grounds and egg shells
- ✔ Landscape trimmings like leaves, grass and branches
- ✔ Food soiled paper like napkins and paper plates

Check in with local service providers on what is acceptable in your compost program.

Feeding people and feeding animals are the first priority in reusing food waste.

Source: CalRecycle

Tim Dewey-Mattia shows off the vast expanse of waste for recycling at the Napa Recycling and Composting Facility.
PHOTO BY ISRAEL VALENCIA

Keeping Organics Local

A strong organic waste recycling infrastructure benefits all of California

BY ANNE STOKES

Keeping organics out of landfills is good for everyone: Decomposing organic matter is a major source of greenhouse gas, it takes up vast amounts of ever shrinking landfill space and can be used instead as a renewable energy source. Signed in 2016, SB 1383 legislates the reduction of organic waste in California's landfills — 75% by 2025. This means an estimated 20 million tons will have to go elsewhere. To handle it all, CalRecycle estimates the state will need at least 90 new composting facilities.

The Napa Recycling and Composting Facility is one such existing site. Run by Napa Recycling and Waste Services, it processes 100,000 tons of organic material annually collected from Napa, Sonoma County communities, South San Francisco and as far away as El Dorado County.

"Surrounding regions give us material because they have food waste and green waste that need to be composted but they don't have facilities in their communities," said Tim Dewey-Mattia, recycling and public education manager. "There's a lot of materials out there that need to be composted and there's not enough facilities."

To better handle the amount of organic waste they receive, the facility recently underwent an $8 million upgrade to implement more efficient, high-technology systems. In-ground aeration systems, and moisture and temperature monitoring systems will increase the amount of materials the site can process.

> **"There's a lot of materials out there that need to be composted and there's not enough facilities."**
>
> **Tim Dewey-Mattia**
> *Recycling and public education manager, Napa Recycling and Waste Services*

While those systems are slated to be implemented by November 2019, more upgrades are on the planning table, including an anaerobic digester and biomass gasification system, both of which create biogas—a natural, renewable source of energy.

"Right now we're only making compost, but … we actually have plans to then make electricity and we'll be able to sell it back into the grid," Dewey-Mattia said. "We'll be able to make our own renewable closed-loop fuel."

Under SB 1383's new regulations, California residents will benefit both financially and environmentally. CalRecycle estimates the state will save $305 million in landfill costs by 2025. In addition, widespread use of compost benefits California agriculture businesses and reduces water and air pollution associated with artificial fertilizers.

"China stopped taking [recyclable materials] and it messed up our markets because there aren't enough places in California that still process paper and plastic," Dewey-Mattia said. "But we have an amazing market for compost in our local communities. We are the world's leading place for agriculture."

As for creating a larger composting infrastructure throughout the state, Dewey-Mattia said he isn't worried about losing business.

"We don't see more composting facilities as competition. There's enough to go around."

Investing in Sustainability Makes Good Sense

BY ANNE STOKES

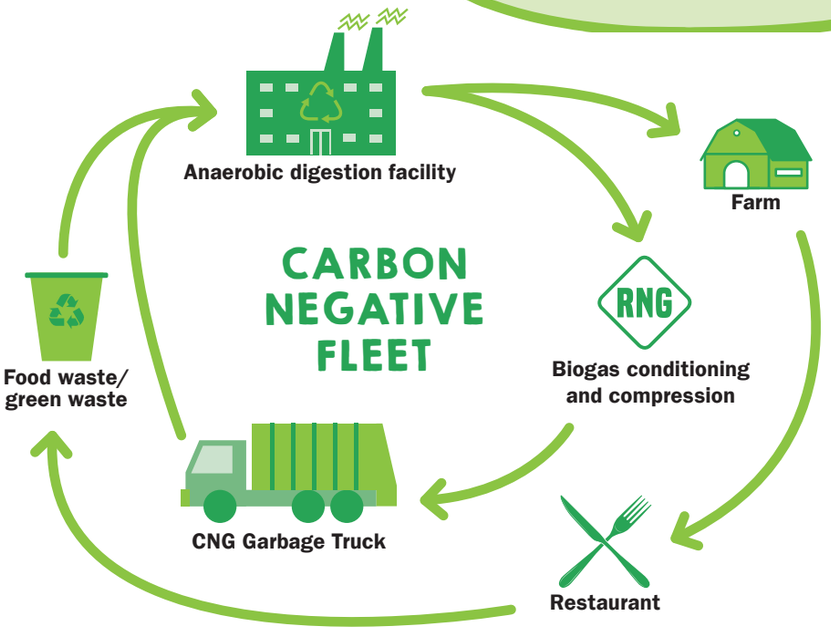
California creates economic opportunity out of trash

As the world's fifth largest economy, California is an economic powerhouse and leader in innovative technologies. With the passage of mandatory recycling requirements — including SB 1383 which aims to reduce the amount of organic waste in landfills and resulting greenhouse gas emissions — the state is establishing itself as a national leader in sustainability as well.

"It is becoming more evident that the status quo is not sustainable. We see the effects of climate change now with deadly wildfires, severe droughts, sea level rise, floods [and] temperature extremes," said Lance Klug, CalRecycle public information officer. "California can leverage its economic and environmental leadership to create a new sustainability model that reduces greenhouse gas emissions while strengthening the economy and improving public health."

Rather than allowing organic waste to languish in landfills, California is creating programs and facilities throughout the state that harness organic waste as a clean renewable energy source. CalRecycle estimates that these programs can reap $17 billion in economic benefits annually.

> **"Every new facility or recycling infrastructure project gets California even closer to better health, cleaner air and water, and more economic opportunity based on sustainability."**
>
> Lance Klug
> *CalRecycle Public Information Officer*



Graphic depicts the ongoing process of recirculating food and other green waste.
PHOTO COURTESY OF CALIFORNIA COMPOST COALITION

"Investments in California's organic waste recycling infrastructure are investments in California's future," Klug said. "Unlike landfilling, recycling organic waste creates new jobs, supports new markets for recovered material, combats climate change, reduces pollution — including pesticide and fertilizer use — and brings California closer to a more sustainable future for our children and their grandchildren."

Those economic benefits include thousands of jobs, revenue from renewable natural gas and compost products as well as decreasing landfill tipping fees and mitigating the costs of expanding or constructing new landfills. Just as important are the health and social benefits associated with a cleaner environment.

"Statewide, California will see billions in savings from decreased health care costs and mortality rates as a result of reduced pollution. Those are real benefits to real families throughout the state," Klug said. "Instead of pollution and environmental health hazards, California's organic waste recycling efforts offer communities sustainable green jobs and a more localized, clean economy that will make our state healthier and more sustainable."

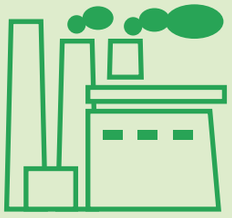
Investing in California's organic waste recycling infrastructure is a win-win situation that benefits entire communities — residents, businesses and local economies.

"Through a shared commitment from the public, the waste and recycling industry, local governments, and the state, we can show the world, once again, how California's core values of environmental protection, public health and safety, and economic vitality can not only coexist, but collectively bolster California's next revolution in sustainable waste management," Klug said. "Every new facility or recycling infrastructure project gets California even closer to better health, cleaner air and water, and more economic opportunity based on stainability."

HEALTH IS WEALTH

Air pollution is directly associated with serious health risks including cancer, and heart and pulmonary disease, particularly for sensitive groups like children and older adults[1].

California Senate Bill 1383 aims to reduce air pollution emissions by keeping organic waste out of landfills. While the cost of implementing and maintaining programs will be passed onto the public through a nominal **$662 per business and $17 per household per year**[2], the public **already** pays the hidden social costs of poor public heath: Unhealthy workers are less productive and profitable for employers and are less able to recirculate their income back into the economy.



Through SB 1383 efforts, by 2025 California hopes to see an estimated:

- ✔ **4,300 new jobs in waste management** and remediation services[2]
- ✔ Average statewide disposal **cost savings of $305 million**[2]
- ✔ Potential net economic benefit of food recovery costs of **$1.2 billion**[2]
- ✔ **$4.8 billion** value reduction in **mortality, hospitalizations and emergency room visits**[2]

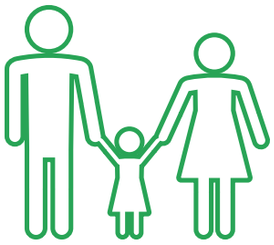
Sources:

[1] World Health Organization

[2] CalRecycle's Standardized Regulatory Impact Assessment (SRIA)

You Can Help!

To successfully limit food waste, everyone has to chip in.
Learn some of the things you can do to pivot California in the right direction:



CONSUMERS

Altering purchasing, storage and disposal patterns are critical to dealing with food waste, including:

- ✔ Composting at home
- ✔ Purchasing unusually-shaped (but equally delicious) produce at farmers' markets; they are most likely to be wasted
- ✔ Keeping organic waste separated from plastic and other contaminants

Additionally, the EPA encourages individuals, restaurants, schools and other organizations to perform food audits. These audits:

- ✔ Track what is thrown out
- ✔ Examine the condition it was in when it was disposed of
- ✔ Examine what is thrown out the most and least often to understand waste patterns and make changes according to such observations.
- ✔ Help share tips and information with friends and family

STATE LEGISLATORS AND LOCAL OFFICIALS

Developing and implementing policy that addresses food waste is essential to making meaningful change. The EPA's food recovery hierarchy reveals that before dumping food into the landfills, it can be:

- ✔ Donated
- ✔ Fed to animals
- ✔ Turned into fuel and composted

Government officials can create programs, standards and polices that support recycling, composting and food recovery on a mass scale, instead of relying on landfills. Within these policies and programs, officials can:

- ✔ Provide incentives
- ✔ Assist businesses with donating leftover food
- ✔ Utilize food storage packing, which the Food and Agriculture Organization of the United Nations correlates with longer shelf life

WHO IS CALIFORNIA COMPOST COALITION?

The California Compost Coalition advocates for the recycling of organic materials as a critical method to preserve natural resources. As a registered lobbying coalition under the Fair Political Practices Commission, the California Compost Coalition works with public, private, state and national organizations to develop and implement its initiatives. The coalition emphasizes that the recycling of organic materials like vegetable and food waste is a long-term and environmentally friendly solution that mirrors processes that already exist in nature, reduces waste in landfills and benefits the health of citizens.

CALIFORNIA COMPOST COALITION

1822 21st Street
Sacramento, CA 95811

(916) 739-1200

californiacompostcoalition.org

Produced for California Compost Coalition
by N&R Publications, www.nrpubs.com