



Carbon Farming

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Sustainable Organics Management

Mitigate and Adapt, Resiliency with Regeneration

Moving beyond denial, we are learning how to mitigate, adapt, and be resilient while needing to regenerate. Regardless of what causes climate change or viruses, mitigation measures are needed, forcing California to change common practices and be more resource efficient. California farmers are adapting to new weather patterns and drought with some instituting regenerative agricultural practices. These practices have negative carbon emissions; they sequester carbon by using compost and biochar while building healthy soils. We are producing more energy products from our waste and displacing fossil fuels. Electricity delivery now has community choice aggregation and could be transformed into independent power plants with micro-grids. We are trying to build resiliency into our systems so that we are not overly reliant on big utilities, huge imports of high carbon diesel and fertilizers, and instead develop low carbon community-scale systems from our wasted biomass and institute a localized circular economy.

The COVID-19 crisis underway is forcing all of us to mitigate, adapt, and be resilient. It has been a global wake-up call for 7.7 billion people, where we are being schooled by this pandemic scare so we can be prepared for the next, as the frequency and the magnitude may increase with each episode. From working at home to planting victory gardens, we are lowering our carbon footprint. We will emerge more resilient with lessons learned. We will regenerate our community with healing healthy souls and a new economy based upon new protocols, resource optimization, and clean energy.

“[Regenerative Agriculture](#)” describes farming and grazing practices that, among other benefits, reverse climate change by rebuilding soil organic matter with compost

and biochar and restoring degraded soil biodiversity – resulting in both carbon drawdown and improving the water cycle. Lawrence Livermore Labs released a January 2020 report, “[Getting to Neutral – Options for Negative Carbon Emissions in California](#)”, which featured natural solutions where compost and biochar are sequestered into the soils leading to carbon neutrality by 2045. These programs are noted as the most cost-effective solutions, at just \$11 per metric ton of carbon dioxide, where the CARB regulatory offset price is about \$17 per metric ton. Natural solutions are estimated to achieve 21.6 million metric tons of CO₂ per year of negative emissions in 2045, to get to carbon neutral.

Compost production and use is now being viewed as contributing to carbon neutrality at the Natural and Working Lands Workshops and in policy documents. The [January 2019 Draft California 2030 Natural and Working Lands Climate Change Implementation Plan](#) looks to double down on compost and mulch use by 2030 by adding 31,000 to 62,000 acres each year to 2030, and mulching on cropland also increasing at 10,400 to 20,800 acres per year. According to new research, soil could act as a huge carbon sink to help balance out greenhouse gases withholding up to three times as much carbon as is found in the atmosphere. If we can tap into its potential to suck even more carbon pollution out of the air, dirt could save the Earth, and makes us more resilient.

“It is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself.” - Charles Darwin

Proposed Budget

The Capitol buzzwords this year are resiliency and sequestration. The Governor is proposing a Climate Budget with a \$4.75 Climate Resilience Bond measure, where a large coalition is asking for \$100 million of this money. The Governor included Healthy Soils and carbon sequestration in his proposed 2020-21 Budget of \$965 million in his Cap-and-Trade Expenditure Plan. The plan would allocate revenues of \$15 million to Cal-Recycle for anaerobic digestion and composting, \$18 million for Healthy Soils for grants under the California Department of Food and Agriculture (CDFA), \$20 million for Dairy Methane Reduction, and \$208 million for Healthy Forests.

SB 1323 (Skinner), SB 1362 (Stern), and AB 2832 (Cristina Garcia) are promoting carbon sequestration goals with protocols, registry and accounting while pushing carbon negative projects in order to achieve carbon neutral goals by 2045. Lawrence Livermore Labs released a January 2020 report, "[Getting to Neutral – Options for Negative Carbon Emissions in California](#)," which featured natural solutions as being the most cost effective measure where compost and biochar are sequestered into the soils of California. SB 1323 ran with this report which also features carbon negative biofuels as the next most cost-effective solution.

There is a series of carbon farming bills that build upon the Cannella Environmental Farming Act of 1995. AB 3113 (Eggman) adds more technical assistance for the healthy soils grant programs. SB 1028 (Dodd) adds an Advisory Panel. AB 2653 (Kalra) provides incentives for smart farming. AB 2482 (Stone) includes better nutrient management and water efficiency.

[SB 1323 \(Skinner\)](#)

TOPIC: Carbon sequestration on natural and working lands: Registry of projects. This bill would require, no later than July 1, 2021, that the Natural Resources Agency, in coordination with the California Environmental Protection Agency, CARB, and CDFA to establish carbon sequestration goals for natural and working lands. The bill would require CARB to include specified carbon dioxide removal targets as part of its AB 32 scoping plan.

This bill would require, beginning on January 1, 2021, that the office maintain a registry called the California Carbon Sequestration and Climate Resiliency Project Registry for the purposes of identifying and listing carbon sequestration projects in the State that are seeking funding from State agencies or private entities. The bill would require, no later than July 1, 2021, that the office, in collaboration with the Strategic Growth Council, create an application process for project applicants to have their carbon sequestration projects listed on the registry, with the office ensuring that these projects meet certain minimum criteria. The bill would require the office to establish a mechanism for removing these projects from the registry once funded and for tracking the outcomes of those projects.

STATUS: Introduced 2/21/20. In Senate EQ set for 4/15/20 hearing

[AB 2832 \(Cristina Garcia\)](#)

TOPIC: Greenhouse gases: Carbon neutrality. This bill would declare the policy of the State to achieve carbon neutrality as soon as possible, but no later than 2045, and to achieve and maintain net negative greenhouse gas emissions thereafter. The bill would require CARB to work with relevant State agencies to develop a framework for implementation and accounting that tracks progress toward achieving carbon neutrality, and to ensure that updates to the AB 32 scoping plan identify and recommend measures to achieve carbon neutrality.

STATUS: Introduced 2/20/20. In Assembly Natural Resources

[AB 3113 \(Eggman\)](#)

TOPIC: Cannella Environmental Farming Act of 1995: Grant program update. The act requires the Secretary of Food and Agriculture to convene the Scientific Advisory Panel on Environmental Farming for the purpose of providing advice to the secretary on the implementation of the Healthy Soils Program (such practices include compost and mulch applications) and the State Water Efficiency and Enhancement Program. The act requires CDFA to provide an update to the panel on or before January 31, 2021, on aspects of the grant program, as specified. This bill would require, after January 31, 2021, that the department provide to the panel subsequent reports on aspects of the grant program every 2 years.

STATUS: Introduced 2/21/20. In Assembly Agriculture Com. set for 4/15/20 hearing

[AB 1567 \(Aguiar-Curry\)](#)

TOPIC: Organic Waste: Requires the Strategic Growth Council to develop a scoping plan for the State to meet its organic waste management mandates, goals, and targets. It would also require the scoping plan to include among other things, recommendations on policy and funding support for closing the loop on carbon-neutral or carbon-negative organic waste management practices.

STATUS: Passed Assembly (78-0). In Senate Rules waiting assignment

[AB 2680 \(Aguiar-Curry\)](#)

TOPIC: Direct land application of green waste. This bill would require the department, on or before January 1, 2022, to adopt regulations establishing a local permitting and enforcement process for the land application of green material derived from the municipal solid waste stream. The bill would require the regulations to require an entity that engages in the land application of 250 or more tons of green material per year on a single parcel of land to notify the local enforcement agency and to prohibit the land application of 1,000 or more tons of green material /year without an SWFP.

STATUS: 3/17/20 - Re-referred to Assembly Natural Resources

Working Lands

Lawrence Livermore Labs (LLL) released a January 2020 report, “[Getting to Neutral – Options for Negative Carbon Emissions in California](#)”, which featured natural solutions where compost and biochar are sequestered in the soils and with the conversion of biomass into transportation fuels. These programs are noted as the most cost-effective solutions using current technologies on converting food waste, green waste, and wood waste into carbon negative products such as renewable natural gas and biochar from biomass gasification. SB 1323 (Skinner) utilized this study as the basis of a bill to establish the California Carbon Sequestration and Climate Resilience Project Registry for the purposes of identifying and listing carbon sequestration projects in the State that are seeking funding from State agencies and private entities.

To reach its ambitious goal of economy-wide carbon-neutrality by 2045, LLL determined that California will likely have to remove on the order of 125 million tons per year of CO₂ from the atmosphere. California can achieve this level of negative emissions at modest cost, using resources and jobs within the State, and with technology that is already demonstrated or mature. LLL concluded this after a comprehensive, first-of-its-kind, quantitative analysis of natural carbon removal strategies, negative emissions technologies, and biomass resources in the State. When LLL staff present this report at Legislative hearings and conferences, they compared the costs to be \$8 billion per year, or as they say – the cost of garbage in the state – or just 0.34% of the current gross domestic product.

Double Down on Compost Use

The [January 2019 Draft California 2030 Natural and Working Lands Climate Change Implementation Plan](#) (Plan) has been under review for one year, after two years of workshops. The State finally included [CCC metrics](#) to double down on compost and mulch use by 2030 and made compost application a priority. Where the preliminary draft Plan did not include compost use on irrigated cropland at all, now compost application is being targeted, adding 31,000 to 62,000 acres each year to 2030, and mulching over cropland also increasing at 10,400 to 20,800 acres per year.

The analysis to support this Plan used a sampling method to combine COMET Planner outputs from twelve agricultural counties into a statewide average. While specific levels of activity for each practice were required to generate the estimated climate benefits, CDFA will target implementation acres for healthy soils practices generally, rather than on practice specific acreages. Additionally, because a statewide average was used, the acreage target is statewide rather than regional. Considering historic funding levels, it is assessed that implementation at the scale would cost approximately \$18 – \$36 million per year, reducing GHG by 5.3 to 10.7 million metric tons.

This Plan aims to integrate management objectives wherever possible, coordinating all natural and working lands programs under a united approach. The implementation will significantly increase and improve conservation, restoration, and management of California’s natural and working lands through State programs and other means, to enhance their resilience to worsening climate change impacts, sequester carbon, reduce GHGs, and create healthy soils.

The last CARB Workshop was on May 17, 2019, where we heard from academic experts, practitioners, and the public to explore how policy, practices, and innovative financing mechanisms can help California’s natural and working lands contribute to carbon neutrality by mid-century while supporting healthy and resilient ecosystems. We are waiting for the Final Plan, where we want to initiate protocol development at CARB.

SB 1383 Regulations

CalRecycle staff presented the next steps for the SB 1383 rulemaking at the March 17, 2020 Public Meeting, as the regulations continue to move forward through the final steps of the rulemaking approval process.

CalRecycle will be updating the SB 1383 rulemaking package to make minor changes to the final regulatory text and make available for review various source documents relied upon for the rulemaking in response to review by the Office of Administrative Law (OAL). The items identified by OAL that will be addressed by CalRecycle in the regulatory text are primarily to improve clarity of the regulatory language to ensure that the meaning of the regulations will be more easily understood by those persons directly affected by them. The public will have a further opportunity to comment on changes to the text, but the clarifying language modifications will not result in any major changes to the scope of the regulatory action. CalRecycle will also provide a specific notice to the public for the 15-day comment period when the clarified language is available. Further modifications to the rulemaking package unrelated to the text to address procedural requirements will also be part of this process.

As CalRecycle prepares to move into the next phase of implementation following completion of the regulations, CalRecycle will host a webcast on April 20, 2020 on the draft analysis required by SB 1383 by July 1, 2020. Since this analysis will show that significant progress has not been made, incentives and funding will need to be identified, as well as any additional requirements.

The regulations may be adopted by July, when the Recycling Commission convenes. Additionally, after final adoption of the regulations CalRecycle will release a series of implementation tools, including a model ordinance, model franchise agreement, model procurement policy, and model food recovery agreement. These tools will be available to help the regulated community prepare for implementation in advance of the January 1, 2022 effective date of the regulations.



Biochar Update

In order to facilitate broad action on climate change, carbon markets have been developed that utilize greenhouse gas accounting and trading mechanisms to enable entities—whether governments, companies or other institutions—to mitigate, or offset, the GHG emissions associated with their activities. Quantification of the persistent carbon component of biochar can facilitate the participation of biochar projects in carbon markets, providing an additional revenue stream to projects delivering greenhouse gas emissions reductions through soil carbon sequestration. It's time to revive past protocol development efforts for use in California.

The Climate Trust, with funding from the California Energy Commission, assessed biochar in the [May 2014 Report – Carbon Market Investment Criteria for Biochar Projects](#) to determine its appropriateness as a carbon sequestration offset project. Biochar is an inert residue created by pyrolysis, the heating of organic material without oxygen, with the potential to rapidly capture large amounts of carbon. The Report describes what types of biochar projects can most readily qualify as high-quality greenhouse gas offsets for carbon market buyers and investors.

The American Carbon Registry (ACR) listed the Methodology for Emissions Reductions from Biochar Projects in March 2015 as inactive, essentially eliminating prospects for its approval as currently drafted. The International Biochar Initiative believe this outcome reflects the relative novelty of biochar science. Whereas biochar researchers around the globe largely agree on methods to estimate biochar carbon persistence utilized in the ACR methodology i.e., BC+100, the larger scientific community remains unfamiliar with recent advances in the field.

The Climate Action Reserve (CAR) published the [Evaluation of the Opportunities for Generating Carbon Offsets from Soil Sequestration of Biochar](#) in April 2010, proposing a promising methodological framework.

CARB and CAR Programs

The Cap-and-Trade Program is a key element of California's climate plan. It sets a statewide limit on sources responsible for 85 percent of California's greenhouse gas emissions, and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide covered entities the flexibility to seek out and implement the lowest cost options to reduce emissions. At last auction in February 2020, 57 million allowances sold with the current auction reserve fund at \$16.86 per ton. The revenues raised are \$12.5 billion so far and fund an array of programs, including compost and anaerobic digestion facility development at CalRecycle.

CARB adopted the six project types of Regulatory Compliance Offset Protocols that may be used to generate GHG offset credits which include forest, livestock, ozone depleting substances, mine methane capture, and rice cultivation. Forest offsets account for 80% of the market with 136 million credits, where soil has a greater potential to sequester carbon.

These Regulatory Compliance Offset Protocols were first developed as voluntary offset markets typically through the [Climate Action Reserve \(CAR\)](#) and were modified by CARB to be clear and enforceable. There is a dearth of compliance offsets that are needed as the GHG reduction targets ratchet down to 40% by 2030. AB 398 (Garcia) was adopted in 2017 to extend the Cap-and-Trade Program to 2030 and requires CARB to establish a Compliance Offsets Protocol Task Force. The Task Force will provide guidance to CARB in establishing new offset protocols for the Cap-and-Trade Program with direct environmental benefits in the State while prioritizing disadvantaged communities, rural and

agricultural regions. The Task Force met on March 2, 2020, and CCC will provide comments to initiate the development of compost and biochar protocols.

A draft Report is due in the fall and will be presented to CARB in early 2021. The general offset criteria is that reductions must be real, additional, permanent, verifiable and enforceable – beyond business as usual. It will be a multi-year process, will involve all stakeholders and could be ready in a few years as SB 1383 kicks into gear.

With the [Lawrence Livermore Lab](#) recognizing compost and biochar use as carbon negative practices and with the [Natural and Working Lands Climate Change Implementation Plan](#) calling for the doubling of compost use to achieve up to 10.7 million metric tons of GHG reduction, now is the time to develop these protocols. CARB adopted conservative GHG emissions reduction factors for compost use that should be expanded to be more encompassing of all of the co-benefits, and can be used as a starting point to develop the protocol. AB 293 (Garcia, 2019) calls for consideration of offsets on agricultural lands where up to 7.5 million more tons of compost use per year is targeted by 2030.

The [Climate Action Reserve](#) develops voluntary GHG offset and is working on a [Soil Enrichment Protocol](#) which will provide a strong basis for the CARB's regulatory protocol. CAR had prepared a [discussion paper](#) in September 2019 for soil organic carbon accrual on non-forest lands as a policy paper that outlines the challenges with and opportunities. Validating these carbon negative emissions and monetizing them is needed to provide incentives to transport the material to agricultural sites.