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March 8, 2013

Mary Nichols, Chairman

California Air Resources Board

1001 “I” Street

Sacramento, CA 95814

**Re: Allocation of Cap and Trade Proceeds for Bioenergy**

Dear Chairman Nichols:

The Bioenergy Association of California submits these comments on the Draft Concept Paper for the Cap-and-Trade Auction Proceeds Investment Plan. We are very grateful for the Administration’s leadership on climate change issues and look forward to working together to help achieve the goals of AB 32. We urge the Air Resources Board to invest cap and trade proceeds in bioenergy development, which is critical to provide many of the greenhouse gas reductions called for in the AB 32 Scoping Plan and to alleviate environmental justice impacts.

Bioenergy provides renewable electricity, very low carbon fuels, combined heat and power, and renewable natural gas. It significantly reduces methane emissions from dairies, landfills and wastewater treatment facilities and converts those emissions into clean energy and low carbon fuels. Agricultural waste and organic urban waste are underutilized resources that can be used to produce renewable electricity and transportation fuels. Bioenergy from forest biomass diverts excess biomass away from business as usual pile/burn practices while helping to mitigate wildfire behavior thus protecting and enhancing carbon sequestration in California’s forests.

Bioenergy is important to reduce environmental justice impacts by replacing heavily polluting diesel and other fossil fuels with significantly cleaner, lower carbon fuels. Bioenergy also reduces environmental impacts by reducing landfill waste and the air, water and odor pollution from dairies, landfills and wastewater treatment facilities in or affecting environmental justice communities.

Given the manifold benefits of bioenergy, we urge the Air Board to invest cap and trade proceeds in bioenergy development. Specifically, we recommend investments in:

* Dairy digesters to convert methane to low carbon fuels and renewable electricity;
* Forest biomass to divert excess forest biomass that is currently piled and burned into bioenergy and reduce wildfire risks that will enhance and maintain forest carbon sequestration;
* Clean energy production from wastewater treatment facilities, food processing, agricultural and urban organic waste; and
* Production and use of low carbon fuels from organic waste in environmental justice communities.

1. **Importance of Bioenergy to Meet AB 32 Requirements**

Bioenergy is critical to provide many of the reductions called for in the AB 32 Scoping Plan. Bioenergy can make significant inroads in reducing the total of 20 million tons of C02 generated by the dairy, forest and urban waste sectors and make a sizeable contribution to the 15 million tons in C02 reduction attributable to the Low Carbon Fuel Standard. In total, more than 20 percent of the reductions in the AB 32 Scoping Plan depend on bioenergy development.

In addition to providing the lowest carbon intensity fuels according to CARB, bioenergy is the most effective means to reduce greenhouse gas emissions from urban organic waste, wastewater treatment facilities, dairies and other agricultural waste. It is also one of the most important means to maintain carbon sequestration in California’s forests. Finally, bioenergy can provide low carbon fuels and renewable electricity to power the construction and operation of High Speed Rail, reducing its emissions significantly.

1. Methane Capture at Large Dairies (1-6 MMT of CO2 equivalent reductions)

The AB 32 Scoping Plan attributes 1 million metric tons of CO2 equivalent emission reductions to methane capture by large dairies. Recent studies[[1]](#footnote-1) indicate that dairy digesters could actually reduce as much as 6 million metric tons of CO2 equivalent emissions by capturing methane and converting it to renewable electricity and transportation fuels. In doing so, dairy digesters provide emissions reduction at the source (capturing the methane emissions) and by displacing fossil fuel use to produce electricity and vehicle fuels.

In addition, dairy digesters provide one of only four opportunities for approved carbon offsets in California, making them an important tool to provide flexibility and cost-containment for regulated entities. As the AB 32 Scoping Plan notes, offsets “can provide regulated entities a source of low-cost emissions reductions,”[[2]](#footnote-2) yet there are currently very few opportunities for offsets. Using cap and trade proceeds to help commercialize dairy digesters would reduce emissions directly and by increasing the availability of carbon offset credits.

Diary digesters, like other forms of anaerobic digestion, also produce organic fertilizers and soil amendments that are not petroleum based.

1. Forest Biomass to Maintain Carbon Sequestration (5 MMT of CO2 equivalent reductions)

The AB 32 Scoping Plan attributes 5 million metric tons of carbon sequestration to California’s forests, yet California’s forests are increasingly vulnerable to catastrophic wildfire, drought, pests and other climate change impacts that threaten the forests’ ability to maintain carbon and other important values. Wildfires impacted an average of just over 900,000 acres per year of California’s forests (between 2006 and 2010). These wildfire events release greenhouse gases and other toxic emissions while effectively curtailing carbon sequestration. Using forest biomass from forest fuel treatments is a proven means to reduce vulnerability to catastrophic wildfire and maintain carbon sequestration in California’s forests. It also prevents uncapped emissions from the current practice of “pile and burn” of forest biomass.

1. Methane Capture and Bioenergy Production from Urban Organic Waste (10 MMT of CO2 equivalent reductions)

The AB 32 Scoping Plan attributes 9 million metric tons of emission reductions to the diversion of urban organic waste and 1 million metric tons of emission reductions to landfill methane capture. Together, landfills, wastewater treatment facilities and other urban organic waste sources could contribute far greater emissions reductions by converting organic waste and methane emissions to renewable electricity, low-carbon fuels, and organic soil amendments. Investing Cap and Trade Revenues in the development organic waste to energy/fuel results reduces greenhouse gas emissions in at least three ways:

* Production of the lowest carbon intensity energy/fuels resulting in significant greenhouse gas reductions through displacement of fossil energy/fuels;
* Reduction of greenhouse gas emissions from the waste itself and the transport and handling of that waste; and
* Production of beneficial co-products that displace petroleum products.

Diverting urban organic waste - required by Assembly Bill 341 (Chesbro, Statutes of 2011, Chapter 476) - for production of bioenergy, compost and organic fertilizers also provides enormous emissions reductions. Wastewater treatment facilities are increasingly providing an outlet for organic waste such as Fats, Oils, and Grease (FOG) and food waste by converting it to bioenergy and organic byproducts. This eliminates FOG disposal at landfills, increases biogas production, and produces beneficial soil amendments like biochar and other products that sequester carbon reduces the need for petroleum-based fertilizers. Biosolids from wastewater facilities that are land applied not only sequester carbon in the soil, but also eliminate roughly 44 gallons of fossil fuel needed to produce every 200 pounds of inorganic nitrogen fertilizer. When factoring the number of acres to which biosolids can be applied, this is a tremendous GHG impact mitigation practice that should be maximized.

Currently 61 percent of wastewater plants, representing 94 percent of the wastewater flow in the state, employ anaerobic digestion. Most plants satisfy between 40 and 70 percent of their energy needs from methane produced through anaerobic digestion, which eliminates the need to purchase that power from fossil fuel based sources. With the investment of cap and trade proceeds, these percentages could be much higher.

1. Production of Low Carbon Fuels from Organic Waste (15 MMT of CO2 equivalent reductions)

The AB 32 Scoping Plan attributes 15 million metric tons of CO2 equivalent emissions reductions to the Low Carbon Fuel Standard (LCFS), although it also states that just a 10 percent reduction in the carbon intensity of California’s transportation fuels would result in 16.5 million metric tons of reductions in 2020.[[3]](#footnote-3) Despite the importance of the LCFS in meeting the goals of AB 32, the Draft Concept Paper does not include the LCFS under the specific transportation measures listed on pages 10 and 12 of the Paper.

1. Low Carbon Fuels from Anaerobic Digestion

Waste-derived bioenergy produces the lowest carbon fuels in existence, in some cases fuels that are actually *carbon negative* because of the combined methane capture and fossil fuel displacement. High solids anaerobic digestion of food and yard waste has the lowest carbon intensity of any fuel. The California Air Resources Board has determined that the carbon intensity of renewable natural gas from anaerobic digestion (using dry fermentation of food waste with green waste) is -15 grams of CO2e/MJ. CalRecycle, in its Program EIR for AD facilities, has projected the need to develop 70 anaerobic digestion facilities that each process 50,000 tons per year or 210 facilities that each process 20,000 tons per year to meet the AB 32 Scoping Plan requirements. Doing so could yield 23.5 million diesel equivalent gallons per year of ultra low carbon fuels.

2. Low Carbon Fuels from Landfill Biomethane

In 2010, CalRecycle determined that 95 percent of the landfill “waste-in-place” had an active gas collection system that resulted in the collection of approximately 22 billion standard cubic feet (scf) of useable biomethane, equivalent to approximately 3.8 million barrels of petroleum transportation fuels. California’s landfill gas, which is extremely low carbon when converted to transportation fuels intensity (only 3 percent of the carbon intensity of diesel), could meet *half of the total carbon reduction* required by the Low Carbon Fuel Standard (5 of the required 10 percent reduction in fuel carbon intensity required by the LCFS). Yet, only 53 percent of this low carbon collected biogas is used beneficially to produce energy or fuel -- mostly electricity. Very little is used to produce transportation fuels. The remaining 47 percent is flared and wasted.

Further, onsite electricity generating engine sets are under increasingly stringent air district standards for criteria pollutant controls, principally NOx and CO. California is faced with the prospect that many of these engines may be shut town with a return to flaring and wasting the gas. With the recent passage of AB 1900 (Gatto, 2012), other options for the use of this gas as low carbon renewable natural gas distributed in California pipelines will become a reality if California is willing to make the investment – with a reduction in criteria pollutant emissions. Even if California reaches its goal of 75 percent organic waste diversion from landfills by 2020, California will continue to produce over 22 billion scf of landfill biomethane for the foreseeable future. California should invest Cap and Trade proceeds in the conversion of this gas to low carbon fuels.

1. **Role of Bioenergy in Addressing Environmental Justice**

Bioenergy has a vital role to play in helping California achieve greater environmental justice. Biofuels can replace highly polluting and toxic diesel emissions from heavy-duty vehicles, which tend to be concentrated in and near environmental justice communities. Bioenergy can also reduce air and water pollution caused by fossil fuel-burning power plants. Diverting organic waste from landfills, dairies and wastewater treatment facilities also reduces pollution and odors that impact environmental justice communities. Finally, developing anaerobic digestion and methane capture onsite reduces pollution and odors and makes waste handling much cleaner with fewer impacts on neighboring communities.

There are hundreds of landfills, wastewater treatment facilities and dairies within or affecting the top 10 percent of impacted communities identified by the CalEnviroScreens. Many solid waste and wastewater treatment facilities were built in industrial areas that border low-income neighborhoods. In many cases, solid waste plants and recycling facilities have been built within close proximity to one another. Traditional solid waste and recycling activities are transportation intensive – they involve heavy-duty trucks to deliver and transport solid waste and recyclable materials. These facilities are sources of diesel emissions, dust, noise and odor – all of which impact neighboring communities. In the southern San Joaquin Valley, several large dairies adjoin the most heavily impacted communities and contribute air, water, noise and odor pollution to those communities.

New anaerobic digestion technology and systems that produce renewable natural gas from organic waste improve air and water quality and reduce odor. Facilities that convert this organic waste and utilize it as renewable gas to power their transportation fleets further reduce air pollution, odor and noise pollution (natural gas trucks run more quietly than diesel trucks). Several waste companies in California are planning to do just this – utilize renewable natural gas from their own anaerobic digestion facilities beginning in 2014. Plants that do convert this waste to renewable natural gas will need 15-20% fewer trucks for transportation, as 15-20% of the incoming material is converted to fuel that doesn’t need to be transported to a landfill or composting facility.

Additionally, many anaerobic digestion facilities operate in negative air pressure for the loading and shipping of organic wastes. The buildings vent their interior air to sophisticated biofilters – natural biological systems that remove odor compounds before releasing the air to the environment. The majority of the components of an anaerobic digester system – including digesters and gas cleaners – are fully enclosed to prevent odors from venting into the environment. In addition, anaerobic digestion facilities are largely dust-free, and help to keep particulates out of the air.

1. **Environmental and Economic Benefits of Bioenergy**
2. Jobs and Economic Development, Including in Rural Communities

Bioenergy development creates jobs and economic development that cannot be outsourced. Biopower alone (electricity produced from organic waste) provides about 5,000 direct jobs and generates $575 million in economic activity in California.[[4]](#footnote-4) Biofuels and other bioenergy facilities employ many additional people, and all forms of bioenergy could provide significantly more jobs.

Bioenergy employs more people per megawatt than any other technology because of the ongoing need for feedstock collection/processing/transport and operation/maintenance of the bioenergy production facility. Many of these jobs are and will continue to be, in economically disadvantaged communities.

Bioenergy also provides jobs, income and local energy supplies in rural communities. Bioenergy from dairy and agricultural waste can provide revenue and free or low-cost energy for dairies and farms. Bioenergy from forest biomass provides income, energy and/or heating in rural forest communities.

1. Clean Energy Supplies

In addition to its benefits for greenhouse gas reduction, increasing bioenergy development will help California to meet the Governor’s goal of 12,000 megawatts of clean, distributed generation and the state’s 33 percent Renewable Portfolio Standard (SBX1 2). Four types of bioenergy are eligible for the RPS: Biomass, digester gas (biogas and biomethane produced through anaerobic digestion), landfill gas, and municipal solid waste that is gasified to produce electricity.

Investing in additional bioenergy development will increase California’s energy independence while helping to meet the bioenergy procurement requirements of SB 1122 and the energy storage requirements of AB 2514. Bioenergy provides baseload (available 24/7) renewable electricity that can firm and shape intermittent renewables like wind and solar power without having to use fossil fuels to provide backup generation. Biogas can also provide onsite energy storage, helping to smooth out demand and providing other benefits to the electricity grid. Finally, bioenergy is the only source of renewable natural gas to power fuel cells and make them a truly renewable form of electricity generation.

1. Air and Water Quality

Bioenergy production reduces air and water pollution in several different ways. Bioenergy reduces the need for more polluting fossil fuels to produce electricity and vehicle fuels. Community-scale forest biomass protects air and water quality by reducing catastrophic wildfires that emit enormous amounts of particulate matter (including black carbon) and other air pollutants that are known to impact human health. Reducing wildfires in the upland watersheds also protects California’s primary water source - it’s forested landscapes. The Sierra Nevada region receives 60 percent of the state’s precipitation, provides water for 23 million people and the state’s agricultural industry, and contributes nearly 50 percent of the hydropower generated in California.[[5]](#footnote-5) Diversion of organic waste from landfills reduces the air and water quality impacts of those facilities and the use of anaerobic digestion further reduces air and water quality impacts by landfills and dairies.

Converting methane emissions, from wastewater treatment facilities and landfills, into bioenergy replaces energy used from fossil fuel sources and prevents the flaring of those emissions. Continued investment in gas cleaning and clean combustion technologies is needed to ensure that the conversion of methane gas to bioenergy does not conflict with future ozone and PM 2.5 reduction goals. Because of more stringent air quality requirements, using methane gas to produce bioenergy is becoming less cost effective than purchasing power from utilities, which leads to more biogas flaring and increased greenhouse gas emissions. For example, recently adopted air quality rules in the South Coast and San Joaquin Air Quality Management Districts will lead to increased flaring again unless promising new technologies are commercialized that will meet anticipated air quality standards and ensure that methane gas is fully utilized.

Bioenergy reduces the air pollution caused by open field burning of agricultural waste and pile and burning of forest waste. Bioenergy also produces soil amendments like nutrient-rich compost that retain water, prevent erosion, minimize chemical fertilizer and help grow the next generation of fruits and vegetables.

1. Waste and Odor Reduction

Despite California’s recycling laws, the state still landfills 18 million tons of organic waste each year, nearly 60 percent of all the material that is landfilled annually.[[6]](#footnote-6) Bioenergy can divert most of that organic waste and convert it to renewable energy and fuels, reducing the impacts of landfills on air and water quality and odor. Increasing bioenergy will help the state meet the goals of SB 341, CalRecycle’s Anaerobic Digestion Initiative and Strategic Directives to increase clean energy from organic waste and reduce the amount of organics in the waste stream by 50 percent by 2020.[[7]](#footnote-7)

1. Forest Protection

California’s forests benefit the entire state by providing half of the state’s water supply, carbon sequestration, wildlife habitat, recreation, wood and other forest products, and much more. Yet California’s forests are increasingly vulnerable to catastrophic wildfire and other threats that are compounded by climate change impacts. Decades of fire suppression have resulted in higher than natural fuel loads in California’s forests that make them more vulnerable to catastrophic wildfires. Between 2006 and 2010, wildfires burned an average of more than 900,000 acres in California annually – almost 1 percent of the total area of the state each year. Together, state and federal agencies spend approximately $1.2 billion per year on wildfire management, yet wildfires continue to increase in size and impacts on property, public health and safety. [[8]](#footnote-8)

Numerous studies and demonstration projects have shown that bioenergy from forest biomass helps to reduce the risks and impacts of wildfire and provides other benefits to forest health, including habitat and water quality benefits.[[9]](#footnote-9) By using the biomass from forest fuel treatments, bioenergy helps to reduce dangerous fuel loads and also prevents the use of business as usual “pile and burn” forest biomass disposal methods which emit soot and other air pollutants and can sometimes trigger larger fires.[[10]](#footnote-10)

1. **Specific Recommendations for the 2013-2016 Investment Plan**

Because of the unique benefits of bioenergy, including its significant benefits for disadvantaged communities, the Bioenergy Association of California recommends that ARB allocate a portion of cap and trade revenues to bioenergy development.

Community-scale bioenergy development – like what is called for by SB 1122 and needed to meet the LCFS– will not require long-term subsidies. It requires funding to commercialize new, cleaner and more efficient technologies on the distributed generation scale but, like solar and wind power, the cost of these technologies is certain to go down with increased deployment and experience.

Although some funding exists for bioenergy deployment in the Electricity Program Investment Charge (EPIC) and AB 118, neither of those funds is specifically focused on maximizing greenhouse gas reductions, meeting increasingly stringent air quality standards, maintaining carbon sequestration or reducing environmental justice impacts.

We recommend, therefore, that the Air Resources Board allocate a portion of cap and trade proceeds to bioenergy development to maximize greenhouse gas reductions and carbon sequestration, accelerate the commercialization of community-scale bioenergy technologies, and reduce air, water and odor pollution in environmental justice communities. These recommendations would also help the state to meet the requirements of SB 1122, SBX1 2, LCFS and future environmental regulations.

Specifically, we recommend funding for bioenergy development in four areas to:

1. Commercialize dairy digesters to capture uncapped methane emissions and convert them to renewable electricity and low carbon fuels, producing organic fertilizers and creating carbon offsets under one of only four approved carbon offset protocols in California.

2. Commercialize community-scale forest biomass facilities that are located to maximize benefits for wildfire reduction, watershed protection and carbon sequestration.

3. Expand the development of bioenergy from urban organic waste, agricultural waste and wastewater treatment facilities, including investments in energy generation and gas cleaning technologies that meet anticipated air quality regulations such as the South Coast AQMD’s Rule 1110.2 so that facilities do not resume flaring methane instead of converting it to renewable energy and fuels.

4. Produce low carbon fuels from wastewater treatment facilities, landfills and other urban organic waste sources that directly benefit environmental justice communities by reducing fossil fuel use, especially diesel, in those communities.

Bioenergy is unique in its ability to capture and re-purpose greenhouse gases while producing renewable electricity, low carbon fuels, more sustainable forests and healthier communities. For all these reasons, we encourage the Air Resources Board to allocate a portion of cap and trade proceeds to bioenergy commercialization and deployment.

Sincerely,

Julia A. Levin

Executive Director

cc: Cliff Rechtschaffen, Senior Advisor to Governor Brown

Ana Matosantos, Director, Department of Finance

Matt Rodriquez, Secretary, California Environmental Protection Agency

Karen Ross, Secretary, California Department of Food and Agriculture

1. http://www.e2.org/ext/doc/E2C2DairyStrategyOct2007.pdf;jsessionid=828A410F6371BE1729C0F5DC3EC97379 [↑](#footnote-ref-1)
2. “Climate Change Proposed Scoping Plan,” prepared by the California Air Resources Board, 2008, at page 37. [↑](#footnote-ref-2)
3. “Climate Change Proposed Scoping Plan,” at page 46. [↑](#footnote-ref-3)
4. 2012 Bioenergy Action Plan, page 2. [↑](#footnote-ref-4)
5. Water Education Foundation 2011. [↑](#footnote-ref-5)
6. 2012 Bioenergy Action Plan, page 13, citing “2008 Waste Characterization Study,” CalEPA and CalRecycle. Available at: www.calrecycle.ca.gov/LGCentral/Reports/ReportViewer.aspx?ReportName+ReportEDRSAnnualWaste. [↑](#footnote-ref-6)
7. 2012 Bioenergy Action Plan, page 14. [↑](#footnote-ref-7)
8. 2012 Bioenergy Action Plan, page 8. [↑](#footnote-ref-8)
9. See, e.g., USDA Forest Service, Pacific Southwest Research Station. 2009. *Biomass to Energy: Forest Management for Wildfire Reduction, Energy Production, and Other Benefits.* California Energy Commission, Public Interest Energy Research (PIER) Program. CEC-500-2009-080. [↑](#footnote-ref-9)
10. Bruce Springsteen, Ton Christofk, Steve Eubanks, Tad Mason, Chris Clavin, and Brett Storey, “Emission Reductions from Woody Biomass Waste for Energy as an Alternative to Open Burning,” Journal of the Air and Waste Management Association, Volume 61, January 2011, pp. 63-68. [↑](#footnote-ref-10)