



Submitted Via Email To:  
[climatechange@calrecycle.ca.gov](mailto:climatechange@calrecycle.ca.gov)

July 12, 2013

Teri Wion  
California Department of Resources Recycling and Recovery  
P.O. Box 4025, MS-13A  
Sacramento, CA 95812-4025  
FAX: (916) 341-7701

**Re: Comments from the California Biomass Energy Alliance Relative to CalRecycle Biomass Conversion White Paper**

Dear Teri Wion:

The California Biomass Energy Alliance (“CBEA”) is the trade association of the state’s solid fuel biomass power producers. There are 34 facilities located throughout 19 counties generating 650 MWs a clean renewable power. Four of these facilities are idle, although probably only temporarily; one is down for long-term maintenance and one will be newly on-line by the end of this year. The facilities that are idle are so purely for economic reasons. The power purchase agreements are not economically adequate to sustain operations. Two of them are in key regions in the forest that were once relied on by the US forest Service for their Healthy Forest Initiative projects. For a list of these facilities, their owners and location, please refer to the CBEA web site:

[www.calbiomass.org](http://www.calbiomass.org)

CBEA appreciates the attention received by CalRecycle and the Air Resources Board (“ARB”) during the Waste Management Sector Workshop and the effort put into the Biomass Conversion white paper which attempts to shed light on the important role this industry plays in helping California meet many of its environmental goals, including greenhouse gas (“GHG”) emissions reduction. CBEA would like to make a few key points to direct your attention further and will make specific editing comments below.

**What We Learned From the Energy Efficiency and Co-Benefits Audit**

CBEA does not disagree the state should be looking at every opportunity to reduce GHG emissions. In the biomass industry, focusing on the operations of the facilities themselves should not be a high priority. The largest biomass facilities participated in the ARB’s Energy Efficiency and Co-Benefits Audit. After an extensive, quite thorough and costly process, what we learned is that it *might* be feasible to get less than 1% improvement by reducing primarily parasitic load at a very large cost. This was not a surprising result, but

one that allows us to fairly suggest more GHG emissions savings opportunities that would be associated with more biomass power generation.

### **Converting Biomass Material Gets More GHG Emissions Reductions**

Biomass conversion GHG emission savings opportunities are significantly greater on the fuel side of the equation. Getting wood byproducts and residues out of the waste stream, diverted from landfills and out of the fields and forests provides for so much more real and immediate savings. Technologies are available to take advantage and advance bioenergy generation, yet the State falls far short of its potential to produce clean, reliable bioenergy because its seemingly abundant fuel source – most notably agricultural and forest waste – remains inaccessible due to the significant cost of deployment.

Agricultural residues and in-forest residues are the most difficult types of biomass to collect, process, and transport. For those reasons, these bioenergy fuel sources are the most expensive to utilize. Yet, agricultural and forest wastes can provide the most benefit, including avoided emissions of criteria pollutants, and avoided methane and carbon monoxide that would be generated from open burning of agricultural or forest wastes. Additionally, many of these opportunities for collection of waste wood fuel exist in the most impacted communities (top 10 % of zip codes identified by “CalEnviroScreen”), in the Central Valley from Stockton to Bakersfield. These locations offer opportunities to collect additional agricultural wood waste which contributes to criteria pollutant emission reductions, greenhouse gas emission reductions and opportunities to create jobs in many of the most disadvantaged communities in California. Biomass energy plants that could utilize additional biomass wood fuel exist currently in these areas and several large plants are in the process of being switched from fossil fuel to biomass fuel and will have significant new wood fuel requirements.

Much of the State’s agricultural and in-forest wastes are disposed by open burning which is the least environmentally-preferable alternative for the disposal. Biomass-to-energy offers a much better alternative. In 2009, the California biomass industry converted 2.4 million tons of agricultural residues, and 1.1 million tons of in-forest residues into energy. In doing so, criteria air pollutants from the combustion-for-disposal of these materials, including particulates, NO<sub>x</sub>, CO, and hydrocarbons, are typically reduced by 98 percent (*Figure 1; see page 8*), and in the case of in-forest residues whose use as fuel facilitates the performance of needed thinnings, the overall health and fire-resiliency of the treated forest has been markedly improved. Many opportunities for collection of additional forest wood residues which would produce the benefits of reduced criteria pollutants, reduced emissions of greenhouse gases and better forest health, exist in or near communities that are severely economically disadvantaged. Although these areas have very good air quality which causes them to score lower on the scale established by the “CalEnviroScreen”, they have enormous potential to contribute to GHG reduction efforts and to create jobs in economically disadvantaged areas of California.

Additionally, extensive research has demonstrated that today's biomass energy industry not only displaces the use of fossil fuels, it also decreases the amount of biogenic greenhouse-gas emissions associated with the materials that are used as fuels. Bioenergy production reduces atmospheric greenhouse-gas levels by promoting forestry practices that enhance long-term forest-carbon sequestration, and by reducing the greenhouse-gas potency (including the very important reduction in emissions of methane from open burning of forest waste) of the gases associated with the recycling of biomass carbon to the atmosphere that is an intrinsic part of the global carbon cycle. These biogenic greenhouse-gas benefits are provided in addition to the benefit common to all renewable energy production of avoiding the use of fossil fuels.

The State of California does not just benefit from biomass with cleaner air and reduced greenhouse-gas emissions associated with the disposal of the State's biomass wastes, but decreased consumption of landfill space, reduced wildfire risk in the State's forests and generally healthier forests. The fuel-production alternative also provides many more jobs than conventional disposal of the biomass materials, primarily in rural economically disadvantaged areas of California.

*Figure 2* (see Page 9) below depicts the fuel-supply areas of existing facilities within PG&E's service area, and acreages of public lands that are within the fuel-sheds of these facilities. Some forest landowners rely upon these facilities to process byproducts of fuel reduction and forest health management activities. Public land managers have stated that they prefer to require removal of biomass to a powerplant but often the project does not generate sufficient revenue to cover the transportation cost. Hence, the biomass is piled and burned. The proximity of biomass facilities to forest management projects directly affects the nature and affordability of forest management biomass disposal needs. Powerplant closures and curtailments result in difficult choices for land managers, particularly where open burning is not a viable option for public health, public safety or operational considerations.

CBEA completely disagrees with the statement in the paper that more significant reductions would come from opening more facilities (p 5). There is ample capacity in the current fleet of plants to justify a state sanctioned effort to convert more biomass material. CBEA strongly recommends as part of the short-term solution is the use of AB 32 Cap-and-Trade Auction proceeds for a program designed to maximize the deployment of a clean energy fuel source that addresses the need to access woody biomass. If California wants to advance bioenergy generation in California in pursuit of AB 32 goals, it must address the fuel issue. The solution is consistent with the Governor's Budget proposal for the auction proceeds which noted examining the diversion of organic waste to bioenergy. It is also consistent with the legislative direction which emphasized GHG reduction through clean energy and solid waste diversion. This solution for bioenergy generation would provide immediate and calculable emissions reductions results and jobs created.

### **The Dream of New Biomass Conversion Facilities: All Roads Lead to the CPUC**

It is important to note that new solid fuel biomass plants play another important role in maximizing the amount of conversion of biomass materials, but new facilities is an unrealistic goal in California today under current energy market conditions and Renewable Portfolio Standard (“RPS”) procurement practices of the State’s utilities and the Investor-Owned Utilities in particular. The issue is not a permitting problem. The biggest issue is getting an economically adequate contract capable of sustaining long term operation. We are increasingly concerned that current RPS procurement process does not put baseload power supplies on a level playing field with wind and solar. If the current trajectory remains, California will see not only no new facility proposals but we will lose existing baseload resources while at the same time bulking up on intermittent resources without consideration of and accounting for the significant integration costs associated with maintaining capacity and transmission adequacy. The reason that no biomass plants have been selected in renewable Request for Offers (“RFOs”) is that despite the grid benefits of biomass power, being both baseload and having some ability to cycle to accommodate increasing numbers of peaking renewables, the lowest price has tended to be the most successful. The lowest price is not the complete story; utilities incur significant integration costs with intermittent resources which they are not allowed to price in to the purchase agreement (“PPA”). We urge the Public Utilities Commission (“CPUC”) to study these costs and apply them as appropriate.

CBEA supports the 2012 Bioenergy Action Plan Update Item 2.1: Quantify the Costs and Benefits of Bioenergy. This analysis by the CPUC is essential so biomass power can be properly valued and allowed to compete on a level renewable procurement playing field. Without this analysis, biomass proposals will be subject to prices that are unsustainable for long term operations, regardless of size or location. I encourage you to review the NREL report “The Value of the Benefits of US Biomass Power” (<http://www.nrel.gov/docs/fy00osti/27541.pdf>). The report puts the value of the environmental services associated with biomass energy production in the United States at 11.4 ¢/kWh. This value includes none of the desirable benefits of rural employment, rural economic development, and energy diversity and security provided by biomass energy production. I can assure you this is north of what utilities have been paying for new renewables. We strongly urge CalRecycle and ARB to be partners with the biomass industry and engage the CPUC on getting this action item completed in 2013 so that biomass conversion facilities are fairly compensated for the significant benefits they provide.

### **Biomass Protocols**

Although the AB 32 Cap and Trade Regulation appropriately identifies bioenergy that uses qualifying fuels is carbon neutral, the carbon neutral designation isn’t enough to promote biomass development. Consistent with the Bioenergy Action Plan Update Item 4.6: Consider Adoption of Offset Protocols for Bioenergy, CARB should develop biomass-fuels GHG offset protocols. Currently, the ARB has a GHG offset protocol for

reducing the emissions from livestock waste, but not for other greenhouse gas reductions associated with bioenergy. Adoption of additional offset protocols under AB 32 could help to monetize the GHG emissions benefits associated with bioenergy, helping improve the economics of a facility beyond its PPA. As a number of biomass plants are going off of their original PPAs in the next two to five years, there will be opportunities in new PPAs to fairly compensate these biomass plants for these GHG emissions benefits if a protocol is in place.

### **Long-Term: California Needs Both Utility- and Community-scale Facilities**

The White Paper has provided no rationale for why small community-scale biomass facilities alone should be part of the long-term strategy for GHG emissions reduction associated with biomass conversion. When building a new biomass plant, scale is almost always determined by fuel availability. For example, some of Southern California's mountainous areas recently have been the location of spectacular and massive wildfires, and these forests would certainly be capable of supporting more than 17 MW of generating capacity if real efforts were made over the coming decades to make them healthier and more fire, insect and disease resilient. However, huge quantities of salvage material from the Big Bear Lake Fire could have been beneficially mobilized for fuel use over the past several years, which would have provided significant benefits to the forest-in-recovery, but the cost of processing and transporting these residues all the way to the existing large biomass facilities apparently was too great to allow their use. Small biomass generators in the area would have been very helpful to recovery efforts.

This concept that for biomass conversion smaller is better also ignores the economic facts of developing new or restarting a facility. There are significant economies of scale that benefit 20 MW generator, for example, in comparison to a 3 MW generator. The cost of operations and maintenance on a per MW basis is where the scale comes into play. For example operating staff for an overnight crew at a 3 MW facility is the same as and 18 MW facility (2 employees). For safety and operational reasons staff cannot be reduced. Similarly the cost of mobilizing a boiler or code welding crew to a repair 3 MW boiler is the same as an 18 MW boiler. This concept is similar on every operating and management requirement of the smaller vs. the larger plant, resulting in much higher operation and maintenance costs per MW for the smaller plant. While the smaller facilities should save on fuel costs due to reduced transportation requirements compared to the larger facilities, their fuel prices will be higher than that for larger generators because of just those locational restrictions on the fuel. Additionally, large scale purchases made by larger plants result in lower per ton pricing. Although capital costs are comparable per MW on smaller plants, the much lower non-fuel operating costs on larger plants and better heat rates typically lead to lower overall cost both in fuel costs and O&M costs. Utility scale biomass facilities also use proven technologies that lead to greater reliability and capacity factor.

There is absolutely a role for small community-scale biomass conversion facilities, but they should not necessarily be singled out as part of the short- or long-term solution to

additional GHG emissions reduction. Smartly located and scaled biomass plants, regardless of size, will ideally increase the amount of biomass fuel used at the lowest cost possible.

### **Is it Time to Focus on Biomass Fuel Transportation?**

Another opportunity to get GHG emissions reductions association with biomass conversion facilities is to focus on the transportation of fuel to the facilities. There are roughly 1,000 number of trucks/chip vans serving the 34 facilities around the state. There would be significant emissions reductions if fleets were transitioned to natural gas or if we converted some of these trucks from diesel to natural gas. It is important to note that many of these existing vehicles are now subject to ARB's on-road diesel emission retrofit regulations. Funding should be identified to target these vehicles so there are no interruptions in fuel supply and additional GHG emissions reductions can be realized.

### **Additional Comments/Edits:**

In addition to the previous general comments, CBEA has additional thoughts on the details of the white paper:

- The word "waste" is used incorrectly throughout the white paper. This point cannot be over emphasized. Facilities pay good money and go through a considerable amount of effort to collect; process and transport clean wood byproducts and residues to have it called a waste product. Better terms to use are wood residues, byproducts or wood fuel.
- (Page 1, last paragraph). "Supplemental" fossil fuel use is more accurately defined as a de minimum amount by the CEC RPS Guidebook. The term supplemental does not have any limit. De Minimus does.
- (Page 3, last paragraph) It is incorrect to say the emissions estimates are uncertain because facilities shut down and restart frequently. It is true the industry has lost of great number of plants in the last 10 years, which you correctly identified is for economic reasons, but those MWs are being replaced through reopening previously closed facilities and the conversion of coal plants. The number of MWs generated has remained steady and should therefore be easily calculated with good certainty.
- (Page 7: Permitting New Facilities): Since there has only been one new utility scale facility proposed in the State in the last 10 plus years, there is simply no evidence to suggest that constructing new facilities is very difficult due to local opposition. A more in depth understand of the failure of that one facility will reveal the opposition was to the power purchase agreement, not the permitting of the facility. Placer County, which is in the process of development a new small

scale facility, has in fact the support of the local community and recently approved its permit.

- (Page 8, Emerging Technology and Beneficial Uses for Ash Products) It is incorrect to say ash has limited market value or that ash often contains toxic components.” There exist numerous valuable uses of the byproducts of biomass power plants. The byproducts, which include fly-ash, bottom ash and bed sand, all have beneficial use applications. Well established markets for these byproducts exist that provide economic value-added benefits to the biomass industry and the end users of the byproduct material. The type of fly-ash produced by a biomass boiler depends on the plant technology. Stoker grate boilers produce a high-carbon fly-ash material that has numerous beneficial properties as a soil amendment due to the potassium, phosphorous and pH levels. Fluidized bed boilers produce low carbon fly-ash that contains calcium carbonate as a result of the lime injected into the boilers for emissions reduction benefits. The low-carbon ash from fluidized bed boilers is used to create a very firm and durable surface. This allows for many soil stabilization applications such as road and parking lot subgrade, the surfacing of equipment yards and unpaved access roads and a base for animal bedding. Further research and development efforts are ongoing in California which will likely lead to more and more beneficial applications in the future.

Further, generators of biomass byproducts routinely test and characterize the material in accordance with federal Resource Conservation and Recovery Act and California Title 22 Regulations. Significant data have been generated by the generators that consistently demonstrate that the ash byproduct is not hazardous. We would be pleased to meet with staff if further clarification is needed. Any future drafts should not include these statements.

- The white paper has undervalued the importance of avoided co-pollutants with biomass conversion. It is significant to note that without biomass plants total emissions of carbon monoxide, particulate matter, and volatile organic compounds would be significantly higher. This is recognized in numerous reports from various Air Districts and even established emission factors for biomass plants compared to open burning emissions.

Sincerely,



Julee Malinowski Ball, Executive Director  
California Biomass Energy Alliance

**Figure 1:**

Comparison of Emissions Between Biomass Boilers and Field Burning

| Pollutant       | Field Burning (lb./ton) | Biomass Boiler (lb./ton) | Percent Reduction for Biomass Boiler (Percent Reduction) |
|-----------------|-------------------------|--------------------------|--|
| Sulfur Oxides   | 1.7                     | 0.04                     | 97.6   |
| Nitrogen Oxides | 4.6                     | 0.70                     | 84.8   |
| Carbon Monoxide | 70.3                    | 0.40                     | 99.4   |
| Particulates    | 4.4                     | 0.26                     | 94.1   |
| Hydrocarbons    | 6.3                     | 0.00                     | 100.0  |
| Total           | 87.3                    | 1.4                      | 98.4   |

Emission factors from "Hydrocarbon Characterization of Agricultural Waste Burning", CAL/ARB Project A7-068-30, University of California, Riverside, E.F. Darley, April 1979.

Figure 2

