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Subject: Further incorporation of biomass combustion emissions into the AB 32 cap-and-trade program and greenhouse gas mandatory reporting regulation

Please accept this letter as a recommendation for changes to the proposed greenhouse gas control program (cap-and-trade) and mandatory emissions reporting program.

We respectfully submit this letter with the hopes that it will be considered prior to the final development and publishing of 15-day changes for each program in the near future. We understand that this letter is submitted after the close of the 45-day public comment period associated with noticed regulations, yet we also understand that staff may be open to recommendations for modifications to the program(s) once work to refine them is underway. Additionally, to the extent that CARB staff develop responses to public comments to the programs' CEQA documents, we hope that any and all changes we recommend are considered.

While the specific purpose of this letter is to discuss modifications of these two programs and their supporting documentation, much of the discussion included herein is also applicable to other ongoing efforts in California such as the refinements to the statewide inventory, improved management of forests and ecosystems, and implementation of the low carbon fuel standard. Further, it is important to note that although much of this discussion and our recommendations are directly related to carbon accounting and detecting problems as they arise, a science-based biomass emissions accounting and management program that encourages the best use of biomass and steer away from the worst also results in improved ecosystem services and

improved forest sustainability. We therefore take the opportunity in this letter, where appropriate, to highlight cross-cutting issues and look forward to working with CARB and its sister agencies to improve ecosystem health and carbon accounting across the state.

Many of the groups signing onto this letter have sent, or are planning to send, comments to CARB on this or other topics. Nothing in this letter should be taken as a reversal of prior positions taken by any of the aforementioned groups. Additionally, although the express intent of this letter is to identify the simplest near term measures to improve the AB 32 program and prevent unwanted impacts from the use of biomass for bioenergy, additional steps are needed, not simply to assure accurate carbon accounting but also to protect the State's biological resources and ecosystem health. While the principal focus of CARB's AB32 implementation is, and should be, the climate-related outcome, we understand it to be, and support, CARB's position that collateral impacts from various climate-oriented mechanisms are properly factored into its decision-making.

The 4 issue areas of the letter encompassed below include¹:

- 1) Regulation of greenhouse gas emissions within AB 32 cap-and-trade program
- 2) Adaptive management of the AB 32 cap-and-trade program as it pertains to potential impacts on biologic ecosystems.
- 3) Consideration of potential significant environmental impacts within the AB 32 cap-and-trade program CEQA document (FED)
- 4) The AB 32 greenhouse gas mandatory reporting regulation

1. Restatement of recommendation for biomass inclusion within the AB 32 greenhouse gas cap-and-trade program regulation

Biomass has long been considered a potentially beneficial substitute for some portion of the fossil fuels used both in California and outside our borders. This consideration lies strongest in stationary source energy generation and heavy industrial facility applications as well as liquid transportation biofuels.

To date, the general practice has been to exclude emissions from biomass combustion in greenhouse gas emissions control programs (i.e. treat it as carbon neutral) based on two general premises. First, biomass combustion can avoid activating new fossil carbon to the

¹ Although we are aware that the emissions control program and mandatory reporting program are two separate regulations, we have included recommendations for modifications to both within this single letter. We combine both issues in a single letter because the context and reasoning for the changes to both are identical (i.e. improved knowledge of human behavior and ecosystem changes associated with biomass utilization for compliance with AB 32). Accordingly, we submit this letter to both the Office of Climate Change and the Planning & Technical Support Division, each at CARB.

atmosphere. Second, biomass exists on a balanced short-term carbon cycle where emissions from combustion represent emissions of atmospheric CO₂ that was taken up shortly before.

Recent scientific developments however, building off of long standing scientific principles and understanding, have shown that combustion of biomass does not necessarily result in a net zero emissions. That is, not all biomass feedstock is created equal, and not all biomass utilization and management practices are created equal. Some forms of bioenergy reduce pollutant emissions when compared with fossil fuels and be part of the solution to the climate crisis, other forms will not.

The net climate impacts of bioenergy vary greatly depending on the feedstock source, type, and production practices, as well as other factors. The reason for this is that biomass combustion emits an immediate pulse of carbon to the atmosphere, while the production of biomass affects carbon uptake and emissions from land to varying degrees over past or future periods, without necessarily exactly balancing the climate impact.² For example, using waste biomass materials (e.g. logging debris and mill and crop residues) that would be burned for site preparation in the absence of utilization for energy may create energy with little or no net climate impact. On the other hand, harvesting carbon from biomass that would otherwise have remained stored for a significant time period, and then combusting this material to create energy will reduce average carbon stocking on the landscape and can produce a net increase in atmospheric GHG levels compared to not burning this carbon. Further, recent studies have also shown that over-removing slash that would otherwise be scattered on the forest floor, can, in some cases cause increased soil carbon emissions.³

Given this scientific understanding and GHG accounting uncertainty, and as stated before in a letter sent to CARB on December 14, 2010, **we strongly recommend that CARB develop a system that incorporates the actual emission balance of biomass combustion and feedstock production within the regulatory greenhouse gas control program.** As written in that letter, we stated this concept as follows: “emissions from bioenergy produced through use biomass derived fuels—including especially forest biomass, and “wood and wood wastes” identified in section 95852.2(a)(4)—should, as a default matter, be included under the cap and generate compliance obligations.”⁴

Such a system would substantially reduce the risks of adverse environmental impacts and should be implemented before the program starts in January 1, 2012. If CARB does not incorporate this into the system by 2012, we renew our recommendation that CARB develop and incorporate the actual emissions balance of biomass **as soon as possible.**

² Correspondence from Harmon, Searchinger and Moomaw to The Members of the Washington State Legislature (Feb 2011)

³ Gershenson, A., et al., Accounting for Carbon in Soils, Prepared for the Climate Action Reserve (2011)

⁴ Letter to Mary Nichols and Members of CARB regarding a request to include bioenergy emissions under the cap and account for the greenhouse gas emissions associated with biomass production and combustion. Dated December 14, 2010.

2. Adaptive management of the AB 32 cap-and-trade program as it pertains to potential impacts on biologic ecosystems and consistent application sustainability criteria.

The following recommendation is important regardless of whether CARB changes the provision for biomass carbon neutrality and should be considered for immediate integration into the program as part of a programmatic adaptive management approach.

In general, the CEQA FED prepared by CARB argues there is a low probability of environmental impacts on California forest ecosystems or landscapes stemming from the treatment of biomass emissions as a carbon neutral resource. One reason offered for this assertion is that under a 33% RPS all economically viable biomass use will be developed, leaving the cap-and-trade regulation with little extra ability to facilitate more. (Page 83 FED) However, unlike the RPS facilities, the FED states that major stationary sources (Page 84 FED) and first deliverers of energy into California (Page 85 FED) may use biomass as an AB 32 compliance option. Another compounding reason is the Low Carbon Fuel Standard also sanctions the use of forest biomass for low carbon fuels. Finally, it is important to bear in mind that in recent years much of the environmental controversy over management of federal forests in California (and elsewhere) has revolved around thinning that involved biomass production and has sometimes been promoted on that basis. We urge CARB to examine carefully the issues these practices raise, and not proceed on a blanket assumption that they can generally be counted on to be environmentally benign.

While it is possible that any one program alone may not increase adverse impacts to forest ecosystems, the combined demand and policy incentives to use this resource are more likely to. We therefore **recommend CARB incentivize woody biomass extraction with great caution. Among other precautions, CARB should integrate a 2-part plan into the current proposal, to 1) create a system to alert the agency if negative impacts are likely occurring and 2) revise standards as needed to avoid creating or perpetuating incentives that are likely contributing to adverse impacts. Furthermore, we recommend that the sustainability criteria currently being developed for forest biomass pursuant to the Low Carbon Fuel Standard be considered (once final) for their applicability to forest biomass in the cap and trade program.**

A. Creating a system to alert the agency if negative impacts are likely occurring

There are several ways CARB can integrate indicators of potential environmental impact into the AB 32 cap-and-trade adaptive management program to understand and track the impact of the program's biomass provisions on California biological ecosystems. This evaluation should consist of a program that focuses attention where impacts are likeliest to occur (knowing where to look) and develops a mechanism to measure key indicators of ecosystem health or that can identify unsustainable biomass consumption facilitated by the program (knowing what to look for).

1) Knowing where to look

As a starter, the exercise of looking for deleterious impacts from the biomass provisions of the cap-and-trade regulation does not need to be performed for every acre or parcel in the state, but

rather, only to those areas where impacts are likeliest to occur. For example, **we recommend CARB examine the applicability of the framework developed for the annual FRAP (Fire and Resource Assessment Program) report developed by the California Resources Agency for this purpose.** That report and map, (displayed below) identifies the plants that use biomass in California, and of those plants, identifies areas of sensitive ecological habitat areas within a specified radius around the plant (an area from which each plant is likely to draw biomass from).⁵

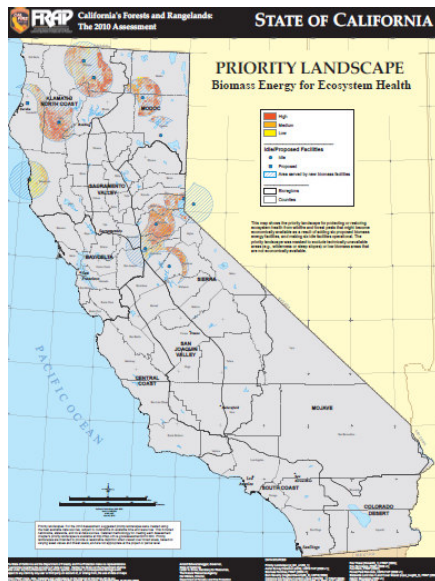


Figure 1: 2011 FRAP report

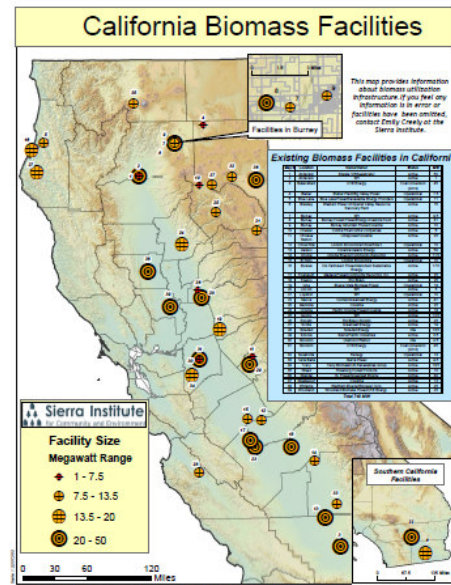


Figure 2: California Biomass Facilities from CA Biomass Energy Alliance

In the FRAP report, the area of review is limited to a 25 mile radius around each plant. However, with the need for dedicated long-term feedstock supply, biomass plants typically analyze haul distances of 60-75 road miles, which is greatly variable due to topography. Therefore, **we recommend CARB look at an initial assessment area of 50 miles around each plant, and either enlarge or shrink the examination area (as needed to capture impacts) as data is gathered pursuant to this recommendation and the others that follow in sections 2.A.2.a – 2.A.2.e below.**

In addition to the California Resources Agency, other bodies have developed similar maps or tools to look at the location of biomass facilities in California. For example, the California Biomass Energy Alliance; Biomass Power Association and California Biomass Collaborative recently released a map of 36 planned and/or operational facilities across California and their relative MW size.⁶ Whether CARB uses the FRAP report or some other tool, maps of this sort are critical indicators of where the potential for impact lies, and are also helpful to limit the resources necessary to track potential risk from the program.

⁵ Available at http://frap.cdf.ca.gov/assessment2010/3.4_emerging_markets.html

⁶ Available at <http://www.sierrainstitute.us/BIOMASS/StatewideFacilities.pdf>

2) Knowing what to look for within areas of concern

In general, **we recommend CARB's program for assessing the occurrence of environmental impacts within areas of focus be multifaceted, using a number of available pieces of data, to provide a high level (coarse) assessment of forest and ecosystem health.** These data sets, some of which currently exist and others which need more development include:

- FIA Data and trends
- FRAP data and annual reports
- New mandatory reporting data collected in the AB 32 program
- Sustainable harvest rate calculations for California forest types
- Remote sensing data and mapping with trends

While finer indicia of biological and ecological condition will likely also be needed, by using multiple coarse indicators, coupled with an expanded mandatory reporting program as recommended below, CARB can minimize overall programmatic costs while maximizing the potential to identify an issue if one does arise. Each of these indicators working together can signal if a harmful impact is occurring and can be used to inform future, deeper examinations of on the ground changes.

a. FIA data

One important, and long-standing dataset CARB and the California Resources Agency should use to look at long term trends of forest stocking and health is the FIA dataset, updated every 5 years. Although FIA may not be able to well document whether forest regrowth is occurring as planned, such data is useful to look at whether harvesting of standing trees is occurring within a specified geographic area.

b. FRAP data and reports

In addition to providing maps of ecological significance, the California FRAP report also examines the change of ecosystem characteristics within the forests themselves. Although CARB itself may not have the staff or resources to interpret FRAP data on a year over year basis or perform assessments of ecosystem health within the FRAP circles, perhaps CARB could partner with the California Resources agency to commit to making sure the FRAP gathers information from these areas on a year over year basis.

c. Mandatory reporting data

As discussed below, **we strongly recommend CARB expand the mandatory reporting regulation as identified in Section 4 of this letter (below) to include the reporting of biomass type, biomass characteristics, and location where the biomass was sourced (or cultivated).** This disaggregated information will allow CARB to understand whether biomass used for energy generation or as a compliance strategy under the program came from waste material in agricultural operations or from forest thinning or logging projects, where the biomass materials would otherwise have been burned as a means of disposal, without displacing fossil

fuel use. Such data is invaluable for looking at potential impacts on California forests because it signals potential problems if overuse of forest material is documented.

d. *Comparing harvest rates to sustainable extraction rates*

Recent scientific advancements have narrowed in on the question of how much biomass can be sustainably extracted from a particular forest. Although the academic literature has not identified sustainable use rates for every forest type or location, a significant body of literature has been developed to enable such rates to be calculated. For example, the Cary Institute of Ecosystem Studies, with contributions from Steven Hamburg, Environmental Defense Fund's Chief Scientist, recently released a paper examining sustainable use rates for forests in the Northeastern United States.⁷

By calculating sustainable extraction rates for California, in particular in the area around biomass and bioenergy facilities, CARB could determine whether observed harvest rates are at or above sustainable conditions. Although such comparisons will not be the final arbiter of whether a harmful impact is actual occurring, or whether any detected impact is due to biomass use for energy, CARB and CalFire would have a better indication of a likely issue and would be signaled that a deeper assessment on the ground level impacts is necessary.

e. *Remote sensing data*

Recent advancements in the use of satellite and aircraft imagery, (i.e. remote sensing with radar / LIDAR, optical scanners, etc.) have opened up new opportunities for high accuracy assessments of forest cover and carbon stocking. At a workshop held at CARB on February 25, 2011, Dr. Greg Asner, Carnegie Institution and Stanford University, and Dr. Wayne Walker, Woods Hole Research Center, presented firm scientific evidence that cutting edge scientific and technological advancements in remote sensing monitoring, measurement and verification could be used assess deforestation, forest degradation and forest carbon stocks faster, more accurately, and at less cost than previously possible. Although the presentation generally focused on this technology for use in tropical nations, it can also be used in California, and in particular, in discrete areas where forest degradation may or may not be occurring due to AB32.

This general inventory approach and information should be incorporated into and inform the update to the statewide greenhouse gas inventory for the forest sector that is currently under consideration. Such efforts would allow the inventory to be completed faster, with improved accuracy, and at less overall cost. We look forward to seeing that process develop and are committed to working with the State to make it a reality.

f. *Compliance with sustainability standards currently being developed in the Low Carbon Fuel Standard proceeding*

Throughout the past year several experts from regulatory agencies, academic institutions, NGOs, and the landowner and bioenergy communities have been meeting to develop standards and safeguards associated with sustainable use of biomass for the production of liquid biofuels pursuant to ARB Board resolution 09-31. These standards should be completed for ARB Board consideration by December, 2011, and could help set the stage for the type of overlay necessary in California and elsewhere to ensure biomass for bioenergy (electricity) are cultivated and managed in a uniform, thoughtful, and sustainable manner. Additionally, some of

⁷ Available at http://www.ecostudies.org/report_biomass_2011.pdf

these standards are directly applicable to cellulosic biofuel plants that utilize biomass to co-generate biofuels and bioenergy, and should be therefore be consistently applied in that context as well.

B. Creating a system that responds to potential significant environmental impacts – adaptive management of the AB 32 program

CARB should also prepare for the situation where impacts are actually observed. This pertains to all areas of the AB 32 program and has generally been termed adaptive management. In circumstances where a potentially harmful impact is observed, a well-established response framework will be critical to protecting California environmental quality and ecosystem health.

The first step the agency should follow to respond to observed impacts is to conduct further study on the exact nature of the impact and key drivers of landowner decision making and biomass utilization at the impact site. If, for example, the comparative economic value of forest products and bioenergy were suddenly changed at a certain location, or the relative cost of building bioenergy / biofuels facilities were reduced, biomass rates could be shifted toward less sustainable extraction volumes. Accordingly, CARB needs to assess the viability of processes and understand how to counteract them if needed.

As discussed both above and within published AB 32 documents, one potential programmatic response the agency could engage in would be inclusion of the direct GHG emissions from biomass combustion - adjusted based on the amount of net carbon uptake associated with future biomass growth compared to baseline growth. A response of this type would immediately remove any climate policy incentive to combust biomass not associated with either waste material or a material associated with an increasing carbon stock on a particular landscape over some period of time. This type of program, as discussed above is our first preference design, and at a minimum should be evaluated if programmatic modifications are required.

3. Consideration of potential significant environmental impacts within the AB 32 cap-and-trade program CEQA document (FED)

As a general rule, CEQA requires an administrative agency to assess the potential for significant environmental impact from its actions, and to choose a program design that mitigates those impacts. Although CARB has stated a belief that such impacts are not likely to occur due to treatment of biomass emissions as carbon neutral, more could be done to ensure that is the case, and also to track whether unforeseen impacts actually do arise. **Accordingly, we recommend CARB consider inserting into the CEQA documentation a discussion of some or all of the environmental indicators mechanisms enumerated in sections 2.A.2.a – 2.A.2.e above.**

4. The AB 32 greenhouse gas mandatory reporting regulation as it pertains to biomass

As discussed above in the section on developing indicators of potential ecosystem changes, **we recommend the current mandatory reporting regulation for the AB32 program be amended to require expanded reporting related to biomass.** Expanded reporting will lay the groundwork necessary to understand how the current program impacts California's biomass resources and will also be necessary if the state determines that a program based on scientific accounting of actual net carbon emissions from biomass production and energy use is appropriate.

As written, the current biomass reporting requirements within the California greenhouse gas mandatory emissions reporting program pertains solely to the amount of direct emissions released during combustion. Within the section on verification of emissions, however, 3rd party emissions verifiers must also check to make sure a biomass supply contract is in place to ensure that reports of biomass combustion emissions were indeed resulting from biomass.

Unlike the current AB 32 reporting program however, the renewable portfolio standard emissions reporting program requires entities claiming the combustion of biomass for the purpose of receiving RPS credit to report the "types and quantities of biomass fuels" pursuant to the California Public Resources Code Section 25742 (d)(1):

Existing facilities generating electricity from biomass energy shall be eligible for funding and otherwise considered an in-state renewable electricity generation facility only if they report to the commission the types and quantities of biomass fuels used.

In alignment with the RPS and to create a rigorous carbon accounting system for biomass emissions, we recommend that CARB require both energy generators (both in state and out of state) and non-energy generating stationary industrial sources combusting biomass should be required to report:

- a. **Emissions of carbon dioxide equivalent associated with combustion of biomass**
- b. **Volume of biomass combusted in bone dry tons, or some other accepted metric, listed by material type**
- c. **Geographic Origin of biomass feedstock, The preferred geographic origin indicator for incorporation into statewide GIS and remote sensing databases is GPS coordinates.**
- d. **Biomass material type (with classifications)**

With regard to the listing of biomass material type, we further recommend that CARB require reporters to classify the feedstock / material type of the biomass they combust. By creating a set of classifications to choose from, the reporting program can minimize reporting burden and to maximize consistency. **Specifically, we recommend CARB require reporters to group biomass into one of six different biomass material categories:**

1) **Construction waste**

- 2) Yard or tree waste
- 3) Mill waste
- 4) Agricultural residue or waste
- 5) Other agricultural products such as purpose grown energy crops
- 6) Forest management biomass (with sub-classifications)

In general, biomass combustion facilities and / or biomass wholesale suppliers already aggregate much of the data types listed above. Therefore, we do not see this classification as requiring the collection of new data. Rather, this will require the routing of data to CARB that is already collected and stored within the system today.

Since different forest biomass extraction and / management techniques can have a material impact on the amount of remaining carbon (both as wood and as retained in the soil) over time, **we also recommend CARB require reporting of forest management biomass into pertinent sub-classifications**. These sub-classifications should be based on the silvicultural technique used to accumulate and extract the biomass from the forest since this is the best indicator of both the effect on forest and the sustainability of the cultivation technique. In general, it is our understanding that this information is generally in the possession of the biomass wholesale supplier, so, again, this programmatic modification should not require a significant effort on the part of the biomass burner to execute.

To facilitate the best method of forest biomass sub-classification for the purposes of carbon accounting and to create a system that allows CARB to determine whether the program at large is having deleterious impacts on California forests, **we further recommend CARB examine the appropriateness of two different approaches to sub-classifications and then choose the approach that is easiest to effectuate, with the least administrative burden, and with the most accuracy**. In particular we recommend CARB investigate requiring reporting either by (1) Simple biomass harvest characteristics, (2) biomass size ranges or by (3) the extraction permitting system used the landowner(s).

Potential Sub-Classifications for Forest Management Biomass Reporting within the Mandatory Reporting Regulation

- **Sub-classification based on harvest characteristics:** Perhaps the most simple and instructive class system for biomass is based simple harvest characteristics. We therefore recommend CARB investigate using the following three categories in determining whether to pursue this sub-classification:
 - Whether the material is harvest debris (tops and limbs)
 - Whether the material is slash that had already been in piled and was expected to be burned in place
 - Whether the material is composed of whole logs

- **Sub-classification based on size range:** Based on the development of data associated with the CAR forest project protocol and prior CARB processes, we recommend CARB investigate using the following three categories in determining whether to pursue this sub-classification:
 - Whether the average size of the biomass material is between 0 and 4 inches diameter⁸
 - Whether the average size of the biomass material is between 4 and 8 inches diameter⁹
 - Whether the average size of the biomass material is greater than 8 inch diameter

- **Sub-classification based on permit type:** Based on our extensive experience interpreting methods to extract biomass from forests, we also recommend CARB investigate using a forest biomass sub-classification based on the permit structure used by the forest biomass generator. In particular, we recommend CARB investigate using the following categories:
 - Whether the biomass was collected / harvested through an approved Timber Harvest Plan (with THP plan details reported)
 - Whether the biomass was collected pursuant to an authorization under Section 1038 of the Forest Practices Act as a fuel reduction or forest management project,
 - Whether the biomass was collected pursuant to an emergency exception authorization under Section 1052 of the Forest Practices Act;
 - Whether the biomass was collected from federal forest land
 - Whether the biomass was collected from some other provision or not pursuant to a permit

⁸ CFPA defines slash as tops and limbs and debris up to 4 inches

⁹ Most burn piles are typically slash (4 inches) plus small logs up to 8 inches.

5. Conclusion

We sincerely appreciate the opportunity to deliver these thoughts and recommendations for improvement of the AB32 program as it related to biomass. The purpose of this letter is to enumerate ideas that will assist CARB perform carbon accounting and emissions regulation, as well as progress the state toward a more sustainable forest management and reporting structure. As detailed above, many of the ideas can work together to aid in identification of adverse conditions in California forests as well as develop the information necessary to move the program toward scientific accounting and regulation.

As always, please feel free to contact us as necessary to discuss any or all of the points made herein.

Thank you,

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