March 24, 2017

AB 32 Environmental Justice Advisory Committee
California Air Resources Board
1001 I Street
Sacramento, California 95812

Re: Sierra Stakeholder Comment on EJAC Recommendations for ARB’s 2030 Target Scoping Plan Update

Dear Honorable Members of the Environmental Justice Advisory Committee:

Sierra Business Council (SBC) is a non-profit network of more than 4,000 business, local government and community partners working to foster vibrant, livable communities in the Sierra Nevada. The Sierra Institute for Community and Environment (Sierra Institute) is a nonprofit promoting healthy and sustainable forests and watersheds by investing in the well-being of rural communities and strengthening their participation in natural resource decisions and programs. SBC and the Sierra Institute welcome the opportunity to provide comments in response to the EJAC Recommendations for ARB’s 2030 Target Scoping Plan Update.

While we strongly support the EJAC recommended emphasis on integrating the social cost of carbon into policy decisions, leveraging new investments for job creation and workforce development, building community self-reliance and energy supply, and investing in smart growth (to name a few), we as Sierra stakeholders see an opportunity to broaden the recommendations around forest management and woody biomass utilization to better recognize the region’s climate vulnerability and disadvantaged communities. This letter provides context on the key issues affecting our region, the opportunities woody biomass utilization offer, and addresses biomass concerns posed in the EJAC recommendations.

Sierra Nevada Environmental & Economic Context
The impacts of climate change are being felt across California, including the Sierra Nevada and southern Cascade. Since 2009, several of the most extreme natural events in the state’s recent history have occurred in the Sierra Nevada region, including severe wildfires, diminishing snowpack, and the highest winter average temperatures in over a century.1 Due to the array of ecosystem services the Sierra Nevada region provides to the state, including water supply and carbon storage, a healthy Sierra Nevada directly contributes to the health and resilience of communities across the state.

The Sierra region faces economic challenges through the decline of timber, agriculture, and tourism-based industries. The central and northern Sierra Nevada region has unemployment rates regularly exceed and sometimes double the state unemployment rates. One in five Sierra Nevada residents lives below the poverty line, a number that is consistently higher than the rest of California. Rural economies continue to suffer as families – and often the younger and more highly educated – move in search of employment opportunities elsewhere. In 2010, the region lost 145,000 jobs as a result of companies closing. The twelve counties entirely within the Sierra Nevada Conservancy region have been losing people each year since 2007.

Forest Management Context
Approximately 70% of the productive forestland in the region is publicly owned, with the majority of that managed by the U.S. Forest Service (USFS). A combination of fire suppression and a reduction in active forest management on USFS land in the Sierra Nevada has exacerbated the effects of climate change – yielding a forest that is increasingly susceptible to severe wildfire and widespread forest mortality due to drought, insect infestation, and disease. USFS estimates the total number of dead trees since 2010 to be over 102 million on 7.7 million acres. If mortality rates continue on this trend northward, the region’s forests will shift -- or already has shifted -- from the state’s largest carbon sinks to net emitters of greenhouse gases (GHG). These trends also pose significant threats to public health and safety, biodiversity and wildlife habitat, along with recreation, tourism, and natural resource-based economies.

Current restoration efforts in the Sierra are still grossly out of pace with what is needed. In 2011, the USFS Regional Forester estimated that six to nine million acres of the National Forest System Lands need treatment in response to the impacts of disturbances such as wildfire, climate change, invasive species and human population growth and increase resilience. Specifically, 500,000 acres need to be restored annually to improve forest health and watershed reliability, two to three times greater than current efforts. This means that without a change in policy it will take 30 to 45 years to treat the number of acres needed to make the difference in restoration of national forests. To increase restoration activities to 500,000 acres per year, USFS will need a budget increase of at least $300 million a year -- unlikely considering President Trump’s 21% reduction of USDA’s budget for fiscal year 2018.

The Vision
SBC and Sierra Institute seek restoration of forests and other Sierra ecosystems towards a pre-European settlement condition, and involving forest management that contributes to a high canopy forest with frequent and low intensity fires to promote regeneration and manage overgrowth. In a natural ecosystem, fire returns on a regular basis. When fire is excluded from that natural process, as is the case for 70% of the Sierra Nevada, the resulting fuel buildup can

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dramatically increase the risk of catastrophic wildfires. The only way to get back to that state in the long run is the reintroduction of fire as a management tool, which cannot be done due to current forests densities until thinning is accomplished because of the risk of high intensity high severity fire which destroys soils. In addition, creating a closed canopy forest would have substantial impact on California's water supply because of increased evapotranspiration.

Due to the scale of needed forest restoration activities coupled with the high cost of restoration conducted solely by USFS, a number of Sierra Nevada-based environmental and community groups strongly support policies that would incentivize private investment in regulated woody biomass utilization, thereby kickstarting restoration until the six to nine million acres of forests have been restored and a pre-European fire regime can be reinstated.

Definitions

- **Bioenergy:** Energy produced from organic materials from plants or animals.
- **Biomass:** Organic matter agricultural and forestry residues, municipal solid wastes, industrial wastes, and terrestrial and aquatic crops grown solely for energy purposes.
- **Woody biomass:** The by-product of forest management and restoration, and hazardous fuel reduction treatments, as well as the product of natural disasters, including trees and woody plants (limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment).
- **Woody biomass utilization:** The harvest, sale, offer, trade, or utilization of woody biomass to produce bioenergy and the full range of biobased products including lumber, composites, paper and pulp, furniture, housing components, round wood, ethanol and other liquids, chemicals, and energy feedstocks.

Addressing Common Concerns and Misconceptions of Woody Biomass Utilization

There is a fundamental difference between urban solid waste incineration of the use of forest biomass and recycled construction and demolition debris for bio-energy and associated waste heat and steam.

Clearly there are risks associated with urban waste incineration, including but not limited to:

- Creating a disincentive for waste reduction and recycling programs that divert landfill waste for other more economically efficient and lower emitting uses
- Increasing air and water impacts particularly in communities adjacent to incineration facilities
- The high cost of urban incineration facilities leading to scaling that increases impacts,

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6 In addition to SBC and Sierra Institute, Sierra Nevada-based environmental and community groups including Sierra Forest Legacy, Sierra Foothill Conservancy, Placer Land Trust, Eastern Sierra Land Trust, Bear Yuba Land Trust, Truckee Donner Land Trust, The Sierra Fund, Camptonville Community Partnership and Calaveras Health Impact Product Solutions.
The use of renewable energy credits (RECs) for incineration over more environmentally preferred alternatives
- Difficulty of separating toxic materials from the urban waste stream leading to toxic emissions proven to be harmful
- Difficulty measuring co-benefits in an urban environment where multiple other sources of energy are available

In addition there are specific critiques of woody biomass utilization that must be addressed, including but not limited to:

- Transportation related emissions for delivering biomass to facilities is often uncounted
- Woody materials are less energy dense than other fossil fuels requiring more emissions per Mwh of production
- Biomass utilization acts as a driver for unnecessary forest thinning or timber harvest

Rural woody biomass production is unlike urban incineration in that:

- Most rural facilities are located in low population and low density areas of the state reducing criteria air pollutant exposure
- Most rural facilities are co-located with other operations allowing waste products (heat and steam) to be captured and used, offsetting other fossil fuel sources
- Rural regions often lack access to other forms of renewable energy during peak load times and lack renewables that can provide base load power
- Rural regions have a higher dependence upon fossil fuels for peak load times, and are likely to lag behind the rest of state in energy storage solutions due to scaling issues, meaning there is greater likelihood that bio-energy is offsetting fossil fuels
- Most rural facilities rely primarily on woody renewables meaning risk of exposure due to toxins in the waste stream is lower
- Most rural facilities are using feedstock that if not burned for bio-energy would be burned in the forest leading to more pollutants than if burned in a controlled environment, or would decompose resulting in increased methane emissions. Data are

**Air Quality Benefits**

*Figure 1: Sierra Nevada Conservancy*
available that show GHG emissions and criteria air pollution emissions are considerably lower if biomass is burned in a controlled fashion.\textsuperscript{11}

Some of the other potential problems with biomass can be addressed with a combination of good science and new technologies:

- Biomass to electrical energy generation can reduce both GHG emissions and criteria air pollutants, even with transportation costs factored in.\textsuperscript{12}
- SBC’s GIS analysis of the 11 biomass facilities in the northern Sierra shows a huge surplus of woody biomass available for all facilities within a 30 mile radius of each plant. (SBC will make the GIS database available upon request.)
- Transportation related emissions for construction and demolition debris can be reduced by using existing logistical networks for municipal solid waste to centralize collection, processing and distribution (C&D is already being delivered to landfills but is routinely processed off site at biomass facilities. Installation of wood chippers at MSW facilities could cut transport emissions by as much as 50%).
- Transportation related emissions from woody biomass can be reduced by electrifying fleets for supply using waste heat and off peak production from biomass facilities.
- Existing coal and natural gas facilities are only between 33% and 45% efficient, meaning between 55% and 66% of the heat is wasted. Biomass facilities located in a woody renewables campus facility could capture and use waste heat and steam to deliver district heat, district cooling, and steam. We can achieve quick reductions in pollution and GHG emissions by building more efficient small scale power plants at a scale where waste heat can be utilized through combined heat and power technologies to achieve 80% efficiency and more. This has the added co-benefit of providing lower cost heat and steam to begin to decarbonize other industrial and manufacturing applications.
- Much of the existing literature comparing biomass energy to coal energy compares older-style combustion power plant generation facilities (meaning biomass is burned directly in a boiler to produce steam to run a turbine).\textsuperscript{13} New and small scale direct combustion facilities are being developed along with biomass facilities based on gasification or pyrolysis (meaning biomass is first heated in an oxygen free environment and turned into a gas which is them combusted to fire either a steam or a gas turbine). Gasification is particularly appropriate for smaller scale applications. Burning biomass produces biochar, and this is one of the main byproducts of the gasification. Biochar is a stable solid rich in carbon which can endure for thousands of years in soil and contribute to improved water holding capacity and soil fertility.
- Rural bio-energy facilities can be co-located with production of other woody renewable products such as wood chips for landscaping, cross laminated timber, low carbon bio-based chemicals, polymers and cellulosic materials to replace carbon intensive products.


\textsuperscript{13} Note: 3 MW direct combustion systems are economical and with heat use they can be financially viable. Direct combustion facilities have lower technology risk, and these rural areas may favor lower risk endeavors.
Solutions Recommended:

- Consideration of new individual facilities or groups of facilities should include an analysis of feedstock availability, location, road networks and transportation emissions associated with delivery.
- Consideration of new facilities should include an assessment of the ecological co-benefits of biomass projects, including avoided emissions, forest health, water supply, species habitat and contributions of the project feedstock supply to the adaptation of forested landscapes to climate change.
- Consideration of new individual facilities or groups of facilities should include a full analysis of associated GHG and criteria air pollution impacts, including measuring the costs and benefits associated with offset fossil fuel emissions, avoided emissions from forest burning and black carbon release (second only to CO₂ as a climate change driver), avoided emissions from severity, intensity and return interval of wildfire.
- Preference should be given to smaller facilities located near or adjacent to feedstock and projects that directly offset fossil fuels or return carbon to soils.
- Preference should be given to projects that use the combined heat and power approach to capture waste heat and steam to reduce emissions from other sources.

Specific Suggestions for EJAC Recommendations on Biomass

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<tr>
<th>Section</th>
<th>EJAC Recommendation</th>
<th>SBC/Sierra Institute Suggested Revision</th>
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<tbody>
<tr>
<td>Energy, Green Buildings, Water pg. 8-12</td>
<td>#7 Do not provide energy credits for biomass burning or count it as renewable energy.</td>
<td>Recognize forest biomass as a renewable energy source and allow use of energy credits for biomass burning if the life cycle analysis shows a net reduction in GHG and criteria air pollutants.</td>
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<td></td>
<td>#25 Stop investing in dirty energy. Eliminate subsidies and financing for fossil fuels and in technologies such as corn-based biofuels, agricultural methane, biomass burning, waste-to-energy, or other unsustainable technologies that result in negative impacts on EJ communities. Use funds instead for clean energy projects in EJ communities</td>
<td>Delete &quot;biomass burning&quot; from this list.</td>
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<tr>
<td>Natural and Working Lands, Agriculture, Waste pg. 19-23</td>
<td>#1 ARB and other state agencies (including the California Public Utilities Commission, California Energy Commission, Office of Environmental Health Hazard Assessment, Department of Toxic Substances Control, and CalRecycle) must undertake a process to examine the growing evidence that biomass and biogenic carbon have real and significant climate impacts, examine the long-</td>
<td>Add &quot;Require full life cycle analysis of biomass energy&quot; to this list as a condition of approval.</td>
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distance transport contribution to overall greenhouse gas impacts of burning biomass material, and examine assumptions of health and environmental impacts from burning various materials considered to be biomass, including the impacts of biomass ash. Ash from burning biomass, urban wood waste, and other materials has been found to be dumped on California agricultural land in recent years, and this ash has been found to be contaminated with dioxin and other health-threatening chemicals. Before pursuing increased burning of biomass in California, ARB, the Natural Resources Agency, and related agencies must investigate where ash from the existing burning of biomass is ultimately being dumped, the environmental justice impacts and impact on agriculture, and the cost of biomass ash handling in California. This is of growing importance as new EPA regulations allow for the increased burning of waste and biomass at industrial facilities (i.e. industrial boilers, cement kilns), and as material deemed to be biomass are exempt from compliance obligations under California’s Cap and Trade program.

| #3 Data Collection – timely and comprehensive data collection is essential to avoiding negative impacts and ensuring co-benefits. Such data must include: | Edit point a. to read "emissions from forestry and wood products and avoided emissions from forest management to avoid forest management becoming a net source of greenhouse gas emissions."

| a. emissions from forestry and wood products, since forest management is a net source of greenhouse gases. |

| #5 Healthy Soils – a critical element to land and waste management is soil regeneration. Strategies include: | Strike "do not strip" and replace with "conduct a life cycle analysis before allowing..."

| h. Do not strip forest waste from the mountains to feed biomass plants or transport dead trees to other locations for processing; instead, sequester the carbon on site through chipping and burying, and ensure that it is not at the cost of disadvantaged communities. Include the idea of sequestration in trees. i. Manage forests to maintain a solid canopy and replant open areas immediately. |

| Respectfully, the USFS estimates a need for 500,000 acres per year of forest thinning in the Sierra Nevada alone to eventually return the forest to a pre-European, healthy state. At a 20% thin on a 20 year rotation that would equal 800 million tons per year of burying, much of which would need to be done by hand due to slope. In addition, Sierra forests were never a closed canopy forest; |
much of the landscape had substantial open canopy with mixed species, age and density. The only way to get back to that state in the long run is the reintroduction of fire as a management tool, which can’t be done due to current forests densities until thinning is accomplished because of the risk of soil destroying wildfire. A closed canopy forest will impact California’s water supply through increased evapotranspiration.

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<th>#7 Do not use or provide financial support or investment to gasification and biofuels as qualifying renewable options</th>
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<td>#12 Build biomass, do not burn biomass. Instead of incinerating biomass from trees and municipal solid waste, which puts more carbon dioxide into air immediately, we recommend ARB expand its work to identify and support methods for returning that carbon to the soil, such as composting biomass together with manure, and not using manure for fuel production.</td>
<td>We strongly recommend striking this clause not only because of methane produced from composting, which nonetheless can be appropriate for low value, small particle sized-wood, but consider encouraging biomass’ appropriate, clean and energy-efficient and fossil-fuel reducing use that can produce valuable soil amendments that effectively store carbon.</td>
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<td>#27 Include cultural (tribal) and prescribed burning in the natural and working lands discussion. For balance, coordinate forest discussions and actions with all stakeholders, including the Karuk, Yurok, Maidu, Tule River, and other tribes, as well as federal and state officials (including California’s Tree Mortality Task Force) and environmental groups such as Friends of the Earth and the Center for Biological Diversity. Tribes must be at the forefront of those conversations.</td>
<td>Respectfully there seems to be a conflict between this goal, which we strongly support, and several of the other forest management recommendations. We also respectfully request that local environmental organizations working in the region, including Sierra Forest Legacy, Sierra Institute, the local Sierra Club chapters, and Sierra Business Council, be given at least equal standing with national environmental organizations.</td>
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Ultimately, through woody biomass utilization we believe we can create a “restoration economy” in the Sierra Nevada that leverages and deploys private sector strategies and business models to address the restoration of natural resources, adaptation to and mitigation of the impacts of climate change, and the promotion of a restorative built environment to improve the state of natural, social and financial capital in communities and ecosystems. This “restoration economy” can begin to address some of the impacts associated with declining economies in our rural regions and growing economic dislocation while improving the environment.

We appreciate your consideration of our suggestions and we welcome any questions.

Sincerely,

Steve Frisch
President
Sierra Business Council

Jonathan Kusel
Executive Director
Sierra Institute for Community and Environment