



September 2, 2021

Richard Corey, Executive Officer
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

RE: 2022 Scoping Plan- Scenario Concepts Technical Workshop: Supporting Biomass Combustion as Part of the Plan

Dear Mr. Corey:

CBEA is the trade organization of California's biomass energy industry. CBEA was created more than 20 years ago with a charter to promote biomass energy as a means to reach the environmental and economic goals of California. On behalf of its members, we have worked diligently as the leading advocate of the solid fuel biomass power industry through California's energy crisis, the introduction and implementation of renewable portfolio standards and waste reduction mandates, through to today's carbon-constrained world governed by AB 32's and SB 100's greenhouse-gas emissions-reduction requirements.

California is currently in the midst of a climate-change-fueled disaster, with wildfires burning across the state and the heart of the fire season still ahead of us. The CBEA joins Governor Newsom in his call to do everything possible to achieve a greenhouse-gas-free energy system for the state as quickly as possible. Biomass generators provide schedulable and highly reliable renewable baseload power that can be used to back fossil-fired generators out of the system without the need for additional storage and/or reliability resources. Biomass also serves to backup intermittent wind and solar resources and can be used to charge storage systems when there is surplus renewable power on the grid.

In addition to representing a source of reliable baseload renewable power, biomass has an additional enormous benefit that is unique among clean energy resources in that it contributes to the reduction of wildfire risk in the state, and thus reduces the massive amounts of greenhouse-gas emissions that wildfires produce in addition to their other highly negative impacts. Thinning and prescribed burns limit both the amount of fire ignitions, and the extent of fire damage when ignitions do occur. Diverting thinning residues from burning in the forest to use as fuel in biomass power plants greatly reduces the air pollution associated with burn piles and prescribed fires, and in addition reduces the risk of pile burns and prescribed burns inadvertently sparking offsite uncontrolled wildfires.

The following are CBEA's responses to questions outlined in the 2022 Scoping Plan Update – Scenario Concepts Technical Workshop AUGUST 17, 2021, presentation.

Carbon Free Electricity Grid

California can't meet its carbon goals, including SB 100, without biomass combustion technologies and suggesting so is illogical and dangerous. First, the SB 100 Report does not propose to meet the statutory goals without biomass and biogas. The SB 100 Core Scenario includes both because they are Renewable Portfolio Standard-eligible resources. The SB 100 Report suggests studying how the state could meet its goals without biomass combustion, but that study has not been conducted and the No Combustion Scenario is estimated to increase the annual total resource cost by \$8 billion, or about 12 percent, compared to the SB 100 Core Scenario.

Second, since a substantial fraction of the biomass fuel used in California would otherwise be open burned in the absence of beneficial use of the material as fuel, excluding biomass from the list of carbon-free fuels would not only **not** reduce the amount of combustion of biomass materials taking place in California, but it would also substitute dirty open burning of these materials for clean combustion in a controlled boiler. There is absolutely no scientific basis for excluding energy resources that utilize combustion. The question should be whether a given energy source is net carbon-free, not whether combustion has been used in the course of its generation. Combustion is a tool, like any other energy conversion process. There is no reason to vilify it.

Third, although bioenergy facilities release emissions that impact air quality, the facilities are dramatic improvements over the emissions produced by open burning and wildfires, **which are most harmful to public health**. Further, wildfires tend to occur in late Summer when air quality is already degraded. Bioenergy produces much lower rates of emissions over the course of an entire year. Some examples of studies that evaluate the air quality improvements associated with bioenergy production include:

- The Stockholm Environmental Institute compared the GHG and air pollutant emissions for 15 different fates for forest biomass across six categories: solid waste disposal, soil amendment, residential energy (e.g., stoves), industrial energy, industrial feedstock, and liquid fuel (Lee et al. 2010) and their findings included:
 - Emissions from pre-processing of residues, including the gathering, chipping, and transporting residues make up less than 4% of overall emissions from all operations.
 - Air pollutant emissions from burning biomass at industrial facilities (with emissions controls) result in CO and PM2.5 emissions that are much lower than emissions from uncontrolled burning on-site.
- Carbon dioxide, methane, and particulate emissions from biomass-combustion boilers were 60%, 3%, and 41% less, respectively, than the rate from pile burning in a recent study in Montana (Jones et al. 2010).

In addition to the adverse impacts of pile burning on air quality, the smoke from wildfires often mixes with atmospheric conditions downwind to create surface ozone (Pfister et al. 2008). During and after fires throughout California in 2007, the ozone produced exceeded public health standards over the course of 100 days (Pfister et al. 2008). Particulate matter also exceeded the background level by four times downwind of fires in California (Wu et al. 2006). Removing forest biomass to promote forest health can help reduce the emissions from wildfires.

Consider the following table, which compares the air pollution from a large biomass power plant with the pollution that would be produced if the agricultural waste biomass were instead disposed of by open-burning.

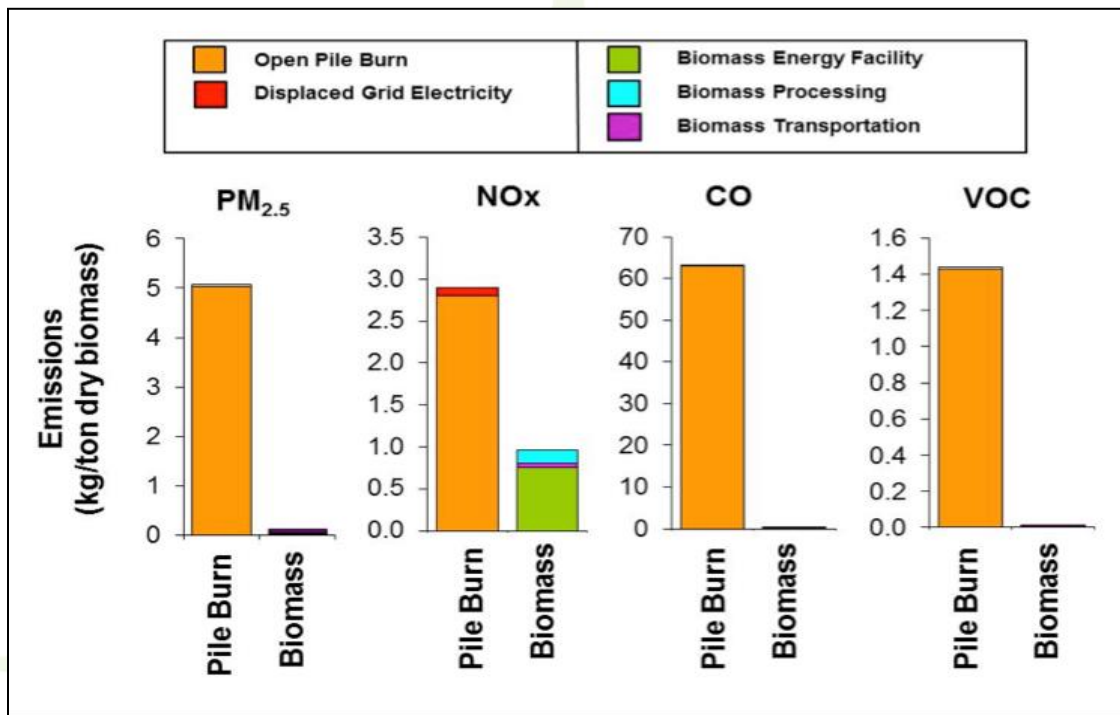
Pollutant	Open-Burn Emissions, Tons/Year	Total Power Generation Emissions, Tons/Year
NO _x	583	177
CO	5,139	45
SO ₂	28	5
PM ₁₀	825	28
THC	876	6

Ref (1). Power generation emissions include all emissions associated with collection and transportation of the biomass materials, and all handling machinery emissions at the power plant, plus the boiler emissions. Also see references (3) and (4).

From the table, it is evident that open burning of biomass, such as is done to dispose of crop residues and forest thinnings, produces 3 to 100 times more emissions of conventional air pollutants than controlled combustion in a biomass power plant.

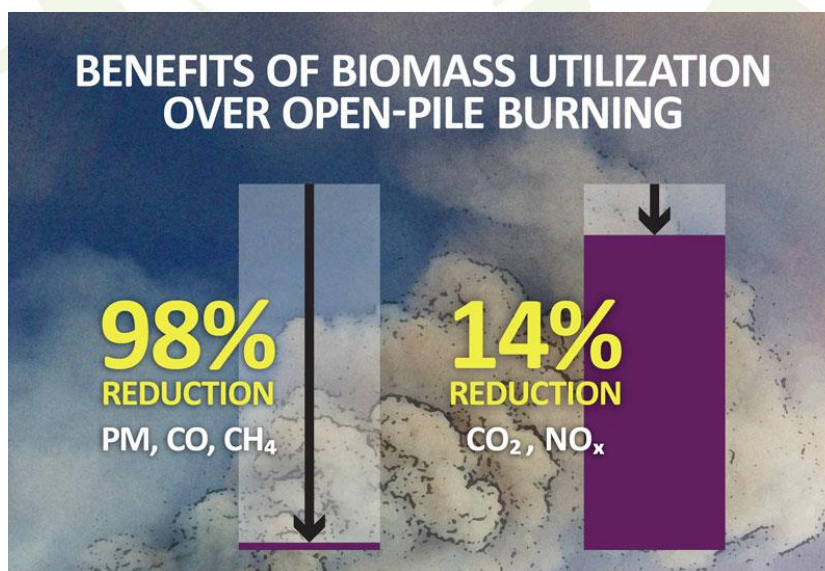
These benefits have been conclusively demonstrated in numerous other comprehensive lifecycle assessments (Springsteen et al. 2015, Springsteen et al. 2011, Lee et al. 2010, Jones et al. 2010, Moyer and Pont 1997). Reductions result from a combination of: (1) utilization of wastes in power plants with efficient emissions control technology; (2) negligible emissions and energy requirements from well controlled and efficient processing and transport equipment and engines;

and (3) production of renewable energy from wastes that are the product of harvesting that is unrelated to any potential biomass value and that replace nonrenewable fossil fuel-generated energy.



Source: CAPCOA Biomass Policy Statement and Placer County Air District

And, again, the California's Forest Carbon Plan



Source: California Forest Carbon Plan, Figure 19, page 135

In addition to these overall emissions reductions, California's biomass fleet of facilities use the same general operation methodologies and employ various technologies to reduce individual plant emissions from the processing of biomass fuel. For example, NO_x emissions are controlled by combustion modifications and add-on controls such as selective catalytic and non-catalytic reduction. Typically, these control systems are successful in simultaneously attaining low NO_x and CO emission levels. Particulate matter control technologies include electrostatic precipitators, fabric filter/baghouses, wet scrubbers, and mechanical separators. No matter the specific emissions control technology, each biomass facility is operating using Best Available Control Technology (BACT).

Oversight of biomass plant emissions is covered by the local air pollution control districts who are also the issuing authority for plant operating permits (Title V). The Title V Permit requires the installation of Continuous Emissions Monitor (CEMs) for O₂, CO, NO_x and Opacity. Continuously monitoring these critical parameters ensures consistent and efficient combustion in the boilers. Also included are fuel quality requirements, notifications requirements, regular quality assurance and emissions monitoring reports to the local air district, annual certification of compliance and regular inspections by the local air district. In addition to local air district permits, most biomass facilities are covered by all of the following programs:

• New Source Performance Standards (NSPS (40 CFR 60))
• Prevention of Significant Deterioration (PSD) / New Source Review (NSR)
• Boiler Maximum Achievable Control Technology (MACT) (40 CFR 63, Subpart DDDDD)
• Risk Management Plan (RMP) (triggered for anhydrous ammonia)
• California Accidental Release Prevention (CalARP) (anhydrous ammonia)
• AB 32 (GHG Reporting)
• AB 2588 (Toxic Hot Spots (Hazardous Air Pollutants))

Both the local air district and the US EPA have permitting authority over significant changes in equipment or methods of operation.

The environmental regulatory oversight for biomass power plants is extensive and impacts all aspects of facility operations. Air emissions are no exception.

The "no biomass combustion" question is further weakened when the co-benefits of bioenergy is already well known by California in other California State Agencies.

Short Lived-Climate Pollutant Methane

For the above reasons we should not exclude biomass derived fuels.



Woody Biomass and Solid Biomass Waste

For the above reason we should not exclude biomass derived fuels. In fact, instead of asking or studying how to live without bioenergy, CARB should be focused on problem solving with this important technology. We should be asking what should be done to ensure the bioenergy facilities operating today are maintained and what will it take to grow the industry. CBEA would make two recommendations. First, the State should increase the size of the BioRAM program and expand the scope of it to include not just high hazard forest material but excess agriculture and landfill wood waste, too. Second, the State should have a special fund to help offset the cost of transporting the harder to get, more expensive, excess wood waste so we can ensure it moves out of the forest, the fields and the landfills and ensure it is beneficially reused.

Role of Engineered Carbon Removal

An essential part of carbon neutrality in any scenario is atmospheric GHG removal (also called negative emissions), to account for GHG emissions which cannot be mitigated. For GHG removal options in California, Lawrence Livermore National Lab (LLNL) produced a report in 2020 called *Getting to Neutral*, where they determined that California will need to remove on the order of 125 million tons of CO₂-equivalents per year from the atmosphere by 2045 to achieve carbon neutrality and remain in line with the current goal of 80% GHG emissions reduction by 2050. The report also concludes that “California can achieve this level of negative emissions at modest cost, using resources and jobs within the State, and with technology that is already demonstrated or mature.” The methods that are outlined in the report are capture and storage of carbon through nature-based solutions on NWL, convert waste biomass to fuels and store CO₂, and direct air capture (DAC) and CO₂ storage.

Carbon Capture and Storage is an important tool that shouldn’t be narrowly defined in this Scoping Plan. Companies are scrambling to address the climate crisis in any way possible. Sending the market signal that carbon technology will be accepted and encouraged in California is one of many ways to reduce and negate global carbon emissions.

Thank you for your consideration of our input. We would welcome the opportunity to provide any further information that would be of value to the ARB on this subject.

Respectfully,

A handwritten signature in black ink, reading 'Julee Malinowski Ball'.

Julee Malinowski Ball, Executive Director
California Biomass Energy Alliance