# THE CONVENTIONAL BIOMASS INDUSTRY IN CALIFORNIA

## FORESTS PROTECTION AND REFORESTATION ARE CRITICAL TO CLIMATE CRISIS

Humans emit an estimated 8.9 billion metric tons of carbon (BMtC) per year. Anthropogenic climate change is a result of humanity's massive carbon emissions. Luckily, planet earth has mechanisms to remove and sequester more than half of this carbon in its forests and oceans. Forests are responsible for annually removing 2.6 BMtC and oceans remove another 2.3 BMtC.[1]

Humans still have a responsibility to emit less carbon pollution to avoid climate catastrophe. However, in the process of emitting less, we cannot afford to lose any of the vital carbon sinks that planet earth has provided for us.

Reducing annual carbon emissions by the remaining 4 BMtC is already going to be a monumental undertaking. If we lose our forests, reducing humanity's net emissions to zero may be impossible.

## WHAT IS CONVENTIONAL BIOMASS INCINERATION?

Currently, there are 34 operational conventional biomass incineration facilities in California. Different than biomass gasification, where biomass is heated and converted to gas, conventional biomass incineration creates energy in a similar manner to coal-fired powerplants. Most of these facilities were constructed in the late 1980s. Now, there are plans to build more.

As a result of legislation, these conventional biomass incineration plants are classified as renewable energy sources. As such, biomass facilities are eligible for subsidies and grants. California's SB 859, passed in 2016, even requires Investor Owned Utilities (IOUs) to purchase a minimum amount of energy from these plants.

Now more than ever, owners and developers of these conventional biomass incineration facilities are being branded as a clean energy source that can solve California's tree mortality crisis. However, conventional biomass incineration emits carbon and criteria pollutants making them far from clean. Furthermore, many of California's dead trees do not need to be removed.

## A RENEWABLE ENERGY THAT POLLUTES

All biomass energy, including conventional incineration of biomass for electricity generation, is classified by the United States and the State of California as renewable energy. Dissimilar to wind, solar or hydro generation, conventional biomass incineration relies on combustion to generate heat and electricity. Solid fuel biomass facilities combust agricultural, yard and forest biomass.

Similar to coal-fired power plants, conventional biomass facilities burn the waste and heat water to produce steam that turns a turbine that produces electricity. Biomass is not nearly as dense as coal and burns even less efficiently than coal.

When any material is combusted, the reaction produces more than heat and carbon dioxide ($CO_2$). At the stack, burning biomass generates more $CO_2$ emissions than even coal combustion. Wood combustion generates 206.8 lbs $CO_2$/MMBtu, compared to 205.6 lbs $CO_2$/MMBtu for bituminous coal.[2]

In addition, like coal generation, solid fuel biomass generation releases criteria pollutants (including oxides of nitrogen (NOx), sulfur oxides (SOx), and fine particulate matter)[3] that cause negative human health impacts, including asthma, heart disease, and premature death. In fact, biomass combustion is dirtier than coal generation with regards to particulate matter and NOx.

Biomass generation proponents state that solid fuel facilities reduce pollution as these plants filter out 99 percent of PM 2.5 pollution and 95 percent of black carbon emissions.[4] However, this claim refers to the most technologically advanced plants. The majority of the existing solid fuel, conventional biomass incineration facilities in California were built in the late 1980s and are not based on the most advanced technology.

Furthermore, as many as 75 percent of conventional biomass facilities across the United States have been found not to be compliant with public health laws.[5]

## THE TREE MORTALITY CRISIS

With drought and pine bark beetles, the trees of California have taken a beating. CalFire estimates an additional 102 million dead trees became part of California's forests between 2010 and 2016.[6] Conventional wisdom tells us that with dead trees comes increased fire danger and habitat loss. Conventional wisdom also once told us that cigarettes were healthy.

Recent studies have shown that dead trees, standing or fallen, are no more likely to ignite than fully alive trees. Additionally, areas with large numbers of dead trees serve an ecological purpose, providing homes for some species and hunting grounds for others.[7]

Conventional wisdom also tells us that areas that have been burned by wildfires are uninhabitable and incapable of regeneration, and that they must be replanted by humans to return to their natural state. Wrong again.

As early as three years after even the most intense fires, burned areas in places like the Sierra Nevada Rim Fire are regenerating, with vibrant vegetation and an abundance of wildlife making their way into these areas. Some species, like the black-backed woodpecker, even rely on post-fire areas for survival.

Yes, 102 million dead trees have become part of California's landscape. However, conventional wisdom has failed us and all these trees are not as hazardous as the logging industry and the conventional biomass incinerator owners have lead us to believe. Of course, 102 million dead trees are significant, startling, and some can be dangerous. However, there are solutions that both protect communities and people while preserving wildlife habitat and natural areas without creating new pollution sources.

## ALTERNATIVES TO BIOMASS INCINERATION

The simplest alternative to biomass incineration is leaving trees where are. The philosophy when removing trees for fire resistance should be "from the structure out" rather than "from nature in." These dead trees will provide habitat while they are around and soil nutrients as they decompose.

This strategy will not work for every tree. If a dead tree presents a danger to a building, road, transmission wires or people, it needs to be removed. But there are still a number of options for disposing of the tree that must be considered before incineration. Trees can be left on the forest floor,away from structures, to naturally decompose. Trees can also be chipped and used for mulch on site or in urban and suburban landscapes. Additionally, if a tree is harvested within a few years after dying, lumber mills can use its wood. In fact, some consumers find beetle-kill wood desirable for furniture, decorative wood products, and siding because it has a unique, blue tint.

As technology progresses, other processes to dispose of excess wood waste could become viable. But more advanced, cleaner waste disposal processes that are sized for sustainability are not likely to be competitive as along as cheaper, conventional, polluting biomass facilities continue to draw government support and subsidies.

## ENDNOTES


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2 *Emission Factors for Greenhouse Gas Inventories.* Rep. Washington D.C.: United States Environmental Protection Agency, 2015. Web. 24 May 2017

3 Washington. State Department of Natural Resources. *Forest Biomass and Air Emissions*. 2016. Web. 24 May 2017

4 Springsteen B, Christofk T, York R, Mason T, Baker D, et al. 2015. Forest biomass diversion in the Sierra Nevada: Energy, economics and emissions. California Agriculture Journal July-September 142-149.

5 Scheck, Justin, and Ianthe Jeanne Dugan. "Wood-Fired Plants Generate Violations." The Wall Street Journal. July 23, 2012. Accessed May 30, 2017.

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