



Sierra Energy  
1222 Research Park Drive  
Davis, CA 95618

Dear California Air Resources Board:

Sierra Energy, a waste gasification company based in Davis, California, is submitting its comments below to the California Air Resources Board 2022 Scoping Plan Update.

Sierra Energy has developed FastOx<sup>®</sup> gasification, a technology that converts waste such as treated waste wood, agricultural and forestry waste into clean, renewable fuels like hydrogen and renewable natural gas, without burning. We are a technology supported by the US Army and California Energy Commission that can both reduce GHG emissions while helping the state meet its climate targets. In addition, we can help address the state's increasingly destructive forest fire problem, which is decimating natural carbon sinks while unlocking enormous amounts of CO<sub>2</sub>e and threatening whole communities

As a company, we are deeply committed to the goals of SB 32 and CARB's vision for how to productively capture and reuse waste in a way that reduces methane from landfills (the largest source of uncontrolled emissions in the state) while displacing carbon-emitting fuels. For this reason, we firmly believe that California needs to take an integrated approach to hit its targets and must leverage all the incredible resources and innovation this state has at hand, including technologies such as gasification. These innovations need a supportive policy and regulatory environment to establish a foothold and ultimately flourish. An integrated approach that facilitates translation of these innovations from labs and private venture companies to viable commercial businesses will create high quality jobs within California and establish the state as a true leader to drive innovations across many dimensions. Our comments below reflect this belief.

**Comment In Reference to Slide 19 Vehicle Fleet Electrification:**

Sierra Energy firmly believes that hydrogen should be included in the zero-emission vehicle plan. While electricity may ultimately be a good solution for light duty vehicles (depending on power source), to mandate that electricity be the winning solution for all vehicles is shortsighted and ignores multiple studies showing that hydrogen may be the best solution for heavy and medium duty vehicles. We do not believe CARB should be picking technology solutions but rather should follow the fine example it set with the LCFS program whereby any technology that solves the problem is, by default, a winning technology. The title of this slide should reflect the true goal of zero-emission vehicles, not zero-emission vehicles only via electrification.

**Comment In Reference to Slide 23 Short-Lived Climate Pollutant Methane:**

The Scoping Plan has missed perhaps the best way to reduce methane from landfills, which is to prevent the biogenic material from getting into the landfill in the first place. We believe gasification of biogenic material that is not suitable for composting or anaerobic digestion and thus destined for landfill should be recognized in this section. The average methane emitted (despite landfill recovery and flaring or energy recovery) is estimated at 0.53 kg CO<sub>2</sub>e/kg waste. This is for an average waste stream and can be

at least double this for certain biogenic portions such as food, yard waste and wood waste. Gasifying C&D wood waste for example and turning that into transportation-quality hydrogen would address both landfill methane and transportation fossil fuel concerns. We urge CARB to specifically consider gasification and other suitable high-temperature thermal conversion technologies as an alternative to landfilling for mitigating short-lived climate pollutants such as methane.

**Comment In Reference to slide 25 Woody Biomass and Solid Biomass Waste:**

We strongly support the use of biomass feedstocks, expressly connected to the production of renewable hydrogen for use in fuel cell vehicles and for RNG production. Taking this approach will encourage development of clean, advanced technologies such as gasification while continuing to discourage technologies like incineration, which is technically incapable of producing hydrogen. Furthermore, it should be recognized that not all biomass is alike. Some biomass is suitable for anaerobic digestion, some for composting, and some materials like tainted wood should be diverted to technologies like gasification that can cleanly convert that material to transportation hydrogen as opposed to having it landfilled (the only other destination for treated wood). In fact, for the huge amount of creosote treated wood there is no legal disposal means in the state of California! For California to meet the requirements of SB 1383 and to achieve carbon neutrality, it is imperative for the state to deal with its forest, agricultural, and construction woody biomass and solid biomass waste. Enabling the utilization of woody biomass opens an important strategic lane for supporting overall forest management efforts. As the current wildfires reinforce, we must have a dedicated strategy for clearing out desiccated woody biomass as a means of reducing the propensity and intensity of climate change-induced wildfires. Utilizing that material as feedstock to generate renewable hydrogen and RNG should be part of that strategy and creates a “win-win” outcome where the climate risk mitigation on the one end is driving climate value creation on the other.

**Comment In Reference to Slide 29 Industry (Manufacturing, Construction, and Agriculture):**

Hard to decarbonize industries should be allowed to utilize clean, renewable fuels such as RNG and hydrogen to lower their carbon footprint. Forcing industries that are not suitable for electrification to electrify or leave the state makes little to no sense; these industries will simply relocate to or expand in other states where higher emissions will be perpetuated. We share the same sky so what purpose does this serve? A single focus on electrification effectively discourages innovation and investment to address hard to decarbonize industries. Rather, it would be prudent to take advantage of the expansion of renewable fuels generated by the LCFS program and utilize those fuels to advance California’s overall climate targets and goals. Many of the great innovations focused on reversing impacts of GHG and climate change are developed in California leveraging considerable resources of public and private institutions supported by venture financing in many cases.

Sincerely,



Mike Hart  
CEO, Sierra Energy