

IHI POWER SERVICES CORP.

August 16, 2021

Rajinder Sahota
California Air Resources Board
1001 I St.
Sacramento, CA 95814

RE: IHI Comments on Engineered Carbon Removal Technical Workshop

Dear Ms. Sahota:

IHI Power Services Corp. is pleased to offer these comments on the engineered carbon removal technical workshop. As noted in our comments in response to the kickoff workshops,¹ biomass energy may be the single most important focus for the upcoming Scoping Plan.

Governor Newsom's Letter to CARB Requires a Focus on Biomass Energy with CCS

Just a few hours after we submitted those comments, Governor Newsom wrote to CARB Chair Randolph asking the agency to look at achieving carbon neutrality as soon as possible, and no later than 2035. The state can undoubtedly achieve this goal if it prioritizes biomass energy with carbon capture and sequestration (CCS).

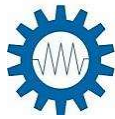
The promise here is clearly laid out in Lawrence Livermore's report, *Getting to Neutral*, which we were pleased to see represented at the workshop. According to that report, biomass energy with CCS offers (by far) the most significant, cost-effective negative emissions strategy for achieving carbon neutrality in the state.² Specifically, the report shows (see Table 40) that biomass energy strategies, using only existing waste streams in the state, could cost-effectively provide climate benefits of 143 MMTCO₂/year by 2025. The state could achieve these outcomes by building 50-100 new facilities, at an average cost of about \$32/MTCO₂. *Doing so would offer the same climate benefits as electrifying every home in the state and removing every passenger vehicle off the state's roads – all within 5 years.*

Negative Emissions Strategies, Especially Biomass Energy with CCS, Can Put California on the Path to Carbon Neutrality No Later than 2035

This is 143 MMTCO₂e/year of new, cost-effective greenhouse gas reductions that

¹ <https://www.arb.ca.gov/lists/com-attach/84-sp22-kickoff-ws-AWhRP1M7VFgBdANg.pdf>

² https://www-gs.llnl.gov/content/assets/docs/energy/Getting_to_Neutral.pdf



CARB can incorporate into its Scoping Plan modeling to achieve accelerated carbon neutrality targets, if the state only prioritizes developing dozens of facilities to utilize existing biomass waste streams in the coming years. There is no more powerful lever CARB can pull in its analysis pursuant to the Governor's letter.

Coupled with natural solutions and direct air capture, the *Getting to Neutral* report shows that the potential for negative and avoided emissions by 2025 is as much as 187 MMTCO₂e/year (see Table 40). This is greater than the level of greenhouse gas emissions in California in 2035 (about 180 MMTCO₂e) if emissions otherwise fall at the same rate beyond 2030 as they do from 2021-2030, suggesting that the Governor's goal is within reach.

Biomass Energy Provides a Wide Array of Economic and Environmental Benefits

IHI is eager to work with CARB to evaluate the full potential of biomass energy with CCS to meet accelerated carbon neutrality scenarios, and then to achieve and maintain high levels of net-negative emissions to help actively improve our climate. Our company is ready to invest and put its capital and expertise to work in California to help bring these facilities online, if the state puts appropriate policy frameworks in place to support those investments.

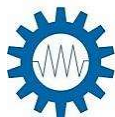
Beyond its clear promise to help the state meet its climate targets, accelerating biomass energy with CCS will provide an array of additional environmental and energy benefits, as we describe in our July 9 comment letter. These include providing firm, zero carbon power; boosting local economic activity and jobs, especially in rural parts of the state; serving as a key enabler to reduce short-lived climate pollutants; and improving local regional air quality by utilizing forest waste and agricultural waste that would otherwise likely be open burned.

IHI's Rio Bravo Fresno facility, in particular, is centrally located to support CARB's agricultural burn phase out and reduces twice as much NO_x in the region as it emits. Adding CCS to this plant or others would bring additional criteria air pollutant co-benefits that would further enhance the benefits of biomass energy.

Recommendations for Scoping Plan Development

Given the tremendous opportunity associated with biomass energy and the Governor's recently direction to evaluate accelerated carbon neutrality scenarios, we encourage CARB to include a focus on enabling these outcomes in the Scoping Plan, and to specifically:

- Evaluate the full potential of biomass energy in California, including biomass



energy with CCS, to contribute to the State's carbon neutrality goals using California-specific data, such as that highlighted in *Getting to Neutral*

- Identify additional benefits and priority outcomes for the use of biomass energy, including supporting the phase out of agricultural burning and improved forest management
- Identify measures to achieve these outcomes, including:
 - Leverage existing and recently shuttered biomass facilities to achieve climate, energy, and other state priorities
 - Set an electricity sector greenhouse gas planning target of 0 MMTCO₂/year by 2035 – in-line with President Biden's target – and a negative emissions planning target for the sector thereafter
 - Support low-cost and low-emissions transport of woody waste from high hazard zones in the forest and agricultural operations through incentives
 - Support demonstration projects for biomass energy with CCS
 - Define biomass energy with CCS as an eligible carbon dioxide removal pathway under the Low Carbon Fuel Standard
 - Commit to revising the Bioenergy Action Plan to further explore how maximize the climate change and other benefits associated with managing the state's biomass resources

Thank you for your consideration of these comments, and we look forward to working with you throughout the Scoping Plan process to fully evaluate the potential of biomass energy to achieve the states climate and air quality goals.

Thank you,

Rick Spurlock
Director of Operations – West Region
IHI Power Services Corp.