September 17, 2021

Ms. Rajinder Sahota

Deputy Director for Climate Change

California Air Resources Board

1001 I Street

Sacramento, CA 95814

Re: Comments on Cap & Trade Investment Plan 2022 – 2025

Dear Ms. Sahota:

Raven SR (Raven), a renewable fuels company, submits these comments on CARB’s draft Cap & Trade Investment Plan for the fiscal years 2022-23 through 2024-25. Raven supports of the state’s Cap & Trade program and, in particular, the use of Cap & Trade revenues to further the state’s climate goals.

At Raven, we are revolutionizing the way the world uses waste. We take any organic waste and convert it to green transportation-grade hydrogen and synthetic Fischer-Tropsch fuels through our patented Steam/CO2 Reforming process. We use steam and a chemical process, not combustion, to process mixed feedstock (biogenics and/or methane) into saleable products in an environmentally friendly, efficient, and profitable way.

 In developing the multi-year Cap &Trade Investment Plan, we urge the Air Board to prioritize:

* Short-Lived Climate Pollutant reductions, which are the most urgent and the most beneficial of all carbon reductions;
* Investments in biomass conversion to meet the landfill diversion requirements of SB 1383;
* The most cost-effective investments based on cost per ton of carbon reductions; and
* Investments that increase community resilience against climate change impacts.

We respectfully submit the following comments on the Cap & Trade Investment Plan presentations on September 2, 2021.

1. **SLCP Reductions Should Be the Highest Investment Priority.**

Raven urges CARB to prioritize investments in SLCP reductions for the next several years. These reductions will immediately benefit California in addressing climate change. The IPCC highlighted the role of SLCP’s in its most recent climate assessment and its “Code Red” report, calling for urgent SLCP reductions.

Dr. V. Ramanthan, a climate and atmospheric scientist at UC San Diego, has stated that reducing SLCP emissions is “the last lever we have left” to avoid catastrophic climate change.1 Not only are SLCPs ten to thousands of times more damaging to the climate than the CO2 emitted from fossil fuel burning, but they only stay in the atmosphere for a few hours to a few months. Reducing them benefits the climate right away. Unfortunately, fossil fuel reductions don’t benefit the climate for decades and we simply do not have time to wait.

The Environmental Defense Fund also recommends focusing on SLCP reductions since SLCP’s have caused half of all the global warming to date and will cause more warming in the coming years than carbon dioxide.2

AB 398 (E. Garcia, 2017) includes SLCP reductions as one of the priorities for use of Cap & Trade funds, yet nothing in the draft Investment Report prioritizes SLCP reductions over other investments that will take decades to begin improving the climate.

Raven urges CARB to make SLCP reduction its highest priority in the Cap & Trade Investment Plan and the state’s climate plans generally. This includes opportunities to reduce methane and black carbon to meet the requirements of SB 1383. Black carbon is more prevalent in California and many times more damaging to the climate (and public health) than methane.

Raven also urges CARB to consider the recommendations in the California Forest Carbon Plan adopted by CalEPA and CNRA, Forest Biomass Utilization Plan adopted by the Board of Forestry, and plans to phase out open burning of agricultural waste, all of which recommend converting agricultural and forest waste to bioenergy to reduce black carbon emissions.

**2. Waste Diversion Must Address Cellulosic Landfill Waste.**

The Investment Plan must address woody waste that is currently being landfilled in addition to digestible waste. The draft investment plan only recommends measures to reduce food waste and digestible organic waste.3 These measures will fall far short of the 75 percent landfill diversion requirement of SB 1383 since the majority of organic landfill waste is cellulosic waste that is non-digestible.

Raven urges CARB to include measures to address cellulosic waste, in particular investments in advanced technology, non-combustion biomass conversion to energy. CalRecycle’s regulations to implement the waste diversion requirements of SB 1383 includes biomass conversion, but the state has not yet invested any Cap & Trade dollars in advanced technology biomass conversion to help meet the landfill diversion requirements. This should be a high priority since organic waste diversion reduces methane emissions from landfills and can be converted to carbon negative energy and fuels, displacing diesel or other fossil fuels and increasing energy reliability.

Raven’s Steam/CO2 Reforming technology is non-combustion and can significantly eliminate municipal solid waste, biomass, including cellulosic waste, and methane emissions from landfills, transforming the waste into clean renewable fuels including hydrogen and Fisher-Tropsch synthetic fuels.

**3. CARB Should Prioritize the Most Cost-Effective Investments.**

The over-arching goal of the Cap & Trade program is to reduce climate pollution. CARB should, therefore, prioritize investments that are the most effective and cost-effective, providing the biggest impact in reducing climate change. CARB’s 2021 report to the Legislature on the state’s climate investments makes clear that the most cost-effective of all Cap & Trade funded investments are investments in converting organic waste to energy. By CARB’s own analysis, that means investments in organic waste to energy because those investments reduce SLCP emissions and often provide carbon negative emissions.

At a minimum, cost-effectiveness of carbon reductions should be one of the metrics included in the Cap & Trade investment plans, just as it is required in the investment plan reports to the Legislature.

**4. CARB Should Prioritize Investments that Increase Community Resilience.**

CARB stated at the September 2 workshop that one of the goals of the next investment plan is to “support a climate resilient and prosperous economic future.”4 Reliable power is critical for medical services, emergency and essential services.

In considering investments in community resilience, Raven urges CARB to consider investments that reduce SLCP emissions and increase energy reliability. For example, converting organic waste to renewable gas – biogas, biomethane, or hydrogen – reduces SLCP emissions while providing firm, renewable power generation and long duration energy storage. Renewable gas can also be used to provide combined heat and power and to provide energy for hard to electrify end uses.

Thank you for your consideration of these comments.

Sincerely,

Matt Murdock

CEO & Founder

*1 Presentation of Dr. V. Ramanathan, UC San Diego and Scripps Institute, Presentation June 24, 2021 at MoveLA*

*Symposium on Short-Lived Climate Pollutant Reductions.*

*2 Ilissa Ocko, EDF, Presentation June 24, 2021, to MoveLA symposium on Short-Lived Climate Pollutant Reductions.*

*3 Draft Investment Plan, released August 19, 2021, Table 1, page ES-9.*

*4 CARB presentation on the Cap & Trade Investment Plan, September 2, 2021, at slide 16.*