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December 12, 2022

Cheryl Laskowski, Ph.D.  
California Air Resources Board  
1001 I Street  
Sacramento, CA 95814

[Subject: Monarch Tractor Comments on November 9<sup>th</sup>, 2022 LCFS Workshop](#)

Dear Dr. Laskowski,

Monarch Tractor appreciates the opportunity to submit comments regarding potential changes to the Low Carbon Fuel Standard (LCFS), as presented at the November 9<sup>th</sup>, 2022 workshop. Monarch Tractor strongly supports LCFS program models that prioritize electrification and we encourage CARB to include electric agricultural equipment in upcoming discussions and rulemaking.

### About Monarch Tractor

Monarch Tractor is an innovative, mission-driven company, headquartered in Livermore, California developing driver-optional electric tractors. We are committed to enabling clean, efficient, and sustainable farming practices by making them economically viable. The Monarch Tractor brings together the benefits of electrification, smart technology, and insightful data to enable farmers to transition to more productive, precise, and sustainable farming practices. Providing a superior platform for farmers, Monarch Tractor is focused on delivering meaningful change for today's farmers and the generations of farmers to come.

Monarch's MK-V compact tractor is an attractive platform for significantly reducing criteria and greenhouse gas emissions in the agricultural sector. The compact tractor segment offers the opportunity for some of the most significant and cost-effective diesel emissions reductions due to its high volume, high utilization, and significant annual growth.

Monarch Tractor offers a zero-compromise solution, including equal or greater performance compared to even the most advanced diesel tractors. A swappable battery assembly allows for near continuous operation and allows operators to re-charge during non-peak rate hours. Autonomy adds the benefit of worker safety –



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from keeping humans out of the fields when Air Quality is hazardous to keeping workers safe with human detection and auto braking.

## State Support for Targets That Align With the Scoping Plan and Carbon Neutrality Goals not Currently Inclusive of Agriculture

Continued innovation in the off-road Agriculture space is not well accounted for in CARB plans. Thanks to intentional state support in the early days of on-road electrification, California is on a trend to outpace its transportation electrification goals in the on-road space. Passenger vehicle EV sales are exceeding CARB's regulatory requirements, while the heavy-duty market is shifting to provide less diesel and more low-carbon intensity fuels – like renewable diesel and renewably generated electricity. By providing more support to zero-emission and other low-carbon intensity fuels in the off-road space through the LCFS, CARB and the State of California can encourage further decarbonization by incentivizing zero Carbon Intensity (CI) installations on farms that need to upgrade their electrical infrastructure to support the wave of off-road electric vehicles.

## Add EER value and Reporting Pathway for electric tractors

As CARB considers amendments to LCFS to ensure its ongoing success and alignment with the latest technology, market and policy developments, we encourage you to incorporate electric tractors into the program, in order to ensure the LCFS is providing benefits and market signals to decarbonize agricultural and other off-road sectors, not just cars and trucks.

Specifically, we support CARB re-evaluating energy economy ratios (EER) and developing new ones for emerging technologies, including electric tractors. We would be happy to work with CARB and support a process to identify appropriate values for EER for electric tractors.

Additionally, the Monarch Tractor Smart Roof enables on-board telematics and data collection that includes data points including charging time, energy consumption during operation, operational area, and more. With built-in connectivity, the Smart Roof also enables hassle free reporting of this data. On-board telematic data collection and transmission are already a requirement for CA based incentive programs, specifically Clean Off-Road Equipment (CORE). Leveraging this technology, the vehicles themselves can be used to generate credits and report into the LCFS program eliminating redundant and costly EVSE communication hardware.



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## Market support for driver-optional, electric tractors aligns with CARB priorities

Identifying EER values for electric tractors will allow this rapidly expanding electric vehicle market to participate in the LCFS fully and accurately, and aligns with CARB priorities for decarbonizing heavy-duty transportation.

Enabling driver-optional electric tractors to participate in the LCFS, with appropriate EER values, will add value to the market to help overcome these barriers and accelerate electrification in off-road and agricultural sectors, in line with CARB's objectives.

Thank you again for the opportunity to comment on this workshop and provide input on potential changes to the LCFS. We look forward to next steps in this process and working with you to ensure the LCFS's continued success – and making sure it reaches all transportation sectors, including off-road applications in the agricultural sector. Please let us know if you have any questions about these comments, our company or technology.

Thank you,   
Praveen Penmetsa  
CEO and Co-Founder  
Monarch Tractor