

July 30, 2014

Katrina Sideco, Chief, Transportation Fuels Branch
California Air Resources Board
Headquarters Building
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812

Re: Crude Oil Provisions to Low Carbon Fuel Standards presented at July 10, 2014 ARB workshop

Dear Ms. Sideco:

The Union of Concerned Scientists and the Natural Resources Defense Council would like to thank the staff at the California Air Resources Board ("ARB") for their work in implementing the Low Carbon Fuel Standard ("LCFS"). As a follow-up to the July 10, 2014 public workshop on refinery and crude oil provisions, we provide the following comments. The LCFS, a major component of our state's clean energy law (AB32), currently is working as intended to reduce carbon pollution, diversify our fuel sources to a cleaner mix, and spur clean technology investments.

- 1. We recognize and thank ARB for their high-quality technical work on the development and use of the open-source OPGEE model to quantify carbon intensities ("CIs") of crude oils.** This is especially important given the large variation in upstream CIs of crude oil that enters California's refineries. Because these inputs are a major determinant of petroleum gasoline and diesel lifecycle emissions, accurate accounting is critical. For some time, we have all recognized that crude oils can vary in emissions quite dramatically. The latest results from OPGEE show that crude oil production emissions alone can vary from as low as 3 grams per megajoule (g/MJ) to as high as 82 g/MJ for some Nigerian crude oils with flaring. Given this enormous variation, a shift to even higher carbon-intensity crude oils relative to the 2010 baseline will detrimentally impact the LCFS program goals. Basic accounting of the CIs of crude oils is fundamental to protecting the program against backsliding as well as to sending a signal for oil companies to invest in carbon reduction technologies while avoiding additional inputs that are even higher in carbon emissions. To send a more direct, stronger signal, ARB should move to a more refinery-specific accounting approach.
- 2. We also support the use of innovative crude technologies, such as solar thermal enhanced oil recovery and renewable electricity generation for crude oil extraction, and believe they can be**

important in meeting LCFS goals. We ask that ARB carefully design the regulatory provisions to incent reduction activities that are truly additional, permanent, and direct. Specifically,

- We support crediting for projects that occur in 2015 and beyond so that new, additional reductions and investments – as opposed to past ones that have already occurred – are rewarded and incented by the program.
- We also support staff proposal to establish a *de minimus* threshold of 5,000 MT CO₂e reductions per year for crediting, which will help ensure that projects that affect large volumes of fuel but have smaller CI reductions are not excluded.
- We **do not** support crediting of projects that are already part of normal business operating procedures (e.g. tightening leaky valves) or that are effectively required by other requirements. Valuable LCFS credits should be reserved for carbon reduction activities that are truly additional and would not happen otherwise, absent the LCFS signal.

We support ARB adopting guiding principles to their approach, as suggested here, and continuing to evaluate and credit technologies on a case-by-case basis as more information becomes available.

3. **We support ARB developing policies that guide the regulation and use of carbon capture and storage (CCS) to reduce emissions under the LCFS.** ARB is currently evaluating the ability for CCS to reduce the carbon-intensity of petroleum gasoline and diesel under the LCFS. In doing so, ARB should:
 - Ensure that projects are limited to those that are directly capturing CO₂ from the fuel supply chain, as opposed to outside-sector credits, in keeping with the goal of the LCFS.
 - We support ARB establishing some initial upper credit limit until there is a better understanding of the potential, timing and scale of the technology and relative contribution to the LCFS. CO₂-based enhanced oil recovery is not a new technology and has been used for many years for oil extraction. Nevertheless, the amount of CO₂ that can be injected may be potentially large - with estimates of up to 60 million metric tons (MMT) of CO₂ injected via EOR by 2020 in the U.S according to the Oil & Gas Journal.¹ Given this large potential far exceeds the actual 17 MMT of reductions estimated to be required in 2020 under the LCFS, ARB should ensure some safeguards are built into the program to account for the large uncertainties.
 - We support ARB establishing monitoring measurement and verification (MMV) rules to ensure sequestration projects are permanent.
 - We support ARB in its determination that the initial credit generator should be the entity making the largest capital outlay and investment risk – in most situations the capture facility.

¹ <http://www.ogj.com/articles/print/volume-112/issue-4/special-report-eor-heavy-oil-survey/co-sub-2-sub-eor-set-for-growth-as-new-co-sub-2-sub-supplies-emerge.html>

Again, we thank ARB staff for their hard work on the LCFS re-adoption and ultimately to help address climate change. We look forward to working together on the successful and smooth implementation of the LCFS.

A handwritten signature in blue ink, appearing to read "Sivaraman Balachandran".

Sivaraman Balachandran, Ph.D., PE
Senior Engineer
Clean Vehicles Program
Union of Concerned Scientists

A handwritten signature in black ink, appearing to read "Simon C. Mui".

Simon Mui, Ph.D.
Director, California Vehicles and Fuels
Natural Resources Defense Council