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Anil Prabhu
California Air Resources Board (CARB)
Low Carbon Fuel Standard (LCFS)
1001 I Street
Sacramento, California

*Submitted Electronically*

**RE: Response to Comments on LCFS Fuel Pathway Application B0521 Related to Indirect Land Use Change (ILUC) Value and Other Comments**

Phillips 66 Company (Phillips 66) appreciates the opportunity to provide a response to public comments on LCFS fuel pathway application B0521 for renewable gasoline from Argentinian soybean oil related to indirect land use change (ILUC) values and other issues.

Indirect Land Use Change Comments

Phillips 66's application uses the California Air Resources Board (CARB) developed indirect land use change (ILUC) emission factor of 29.1 $gCO_2eq/MJ$ for soybean. This factor was developed in the 2015 LCFS rulemaking (see Table 6 of the LCFS regulation), As explained below, a conclusion also supported by independent commentors from Life Cycle Associates and UC Davis, this CARB regulatory ILUC value is a conservative, reasonable value for this pathway application.

The GTAP-BIO and AEZ models were used by CARB to establish the ILUC values. The GTAP-BIO model considers agriculture commodity trading on a global scale, such as trading between the U.S. and other parts of the world, including South America, Europe and Asia. The ILUC value of 29.1 $gCO_2e/MJ$ for soybean does include some land use changes outside of United States being used to meet the anticipated increase in demand in the modeled scenario. This includes increased soybean production in the "Other South America Region" where Argentina locates in the GTAP model. The model results also reflected the impacts from increased palm oil production in Southeast Asia.

Furthermore, the double cropping practices in Argentina allow increased demand from biofuels to be partially met by second cropped feedstock instead of land expansion. The impact of double cropping can be assessed by applying a higher yield price elasticity (YPE), a highly sensitive parameter in GTAP modeling, resulting in a lower iLUC.

The biofuel demand was predetermined in the GTAP modeling to ensure consistency and comparability across different feedstocks. The scale of biofuel demand (i.e., "shock size") is not a highly sensitive parameter in ILUC modeling as revealed in literature, because changes in shock size would cause the total land use change emissions (numerator) and energy output

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(denominator) to change simultaneously, so the emission intensity does not change dramatically.[1] Investments from biofuel industry into agriculture has been driving land intensification significantly in the past years. This allows farmers to use existing land more efficiently rather than land expansion. As Phillips 66 noted in its pathway application, historical data shows that crop-land has not expanded significantly in Argentina since 2005.

It is noteworthy that ILUC, by definition, addresses impacts from biofuel fuel demand increase. Climate impacts driven by other factors, such as increase in cattle feed and human food demand, where it is not directly linked to biofuels, shall not be assigned to ILUC for biofuels.

Finally, the ILUC values used by ICAO are 24.5 (U.S), 27.0 (Brazil), and 25.8 (Global) $gCO_2e/MJ$ for soybean oil HEFA fuels, reinforcing the conclusion that the 29.1 $gCO_2e/MJ$ ILUC value is a conservative value.

Environmental Review Comment

Phillips 66 notes that additional commenters include references to the Environmental Impact Report (EIR) for the Rodeo Renewed project. References to this EIR are irrelevant to this LCFS fuel pathway application. This fuel pathway application is based on operations at Phillips 66 Rodeo U250 hydrotreater which is permitted by the Bay Area Air Quality Management District (BAAQMD). The referenced Air Permit is posted with the fuel pathway application available on the CARB website at the following link.
LCFS Fuel Pathway Application B0520

Conclusion
In conclusion, Phillips 66 requests that the proposed fuel pathway be certified using the CARB regulatory 29.1 $gCO_2e/MJ$ ILUC value.

Sincerely,

*Marc Ventura*

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[1] Xin Zhao, Farzad Taheripour, Robert Malina, et al. Estimating induced land use change emissions for sustainable aviation biofuel pathways. Science of The Total Environment. 2021 (779) 146238. https://doi.org/10.1016/j.scitotenv.2021.146238.