

To: Executive Officer for LCFS Fuel Pathway Carbon Intensity Certification

This comment lists concerns regarding the Low Carbon Fuel Standard Tier 2 Pathway Application No. B0521 submitted by Phillips 66 Company for the production of renewable diesel from Argentinian soybean oil at Phillips 66 Rodeo's refinery. I am submitting this comment as an individual because I have not had sufficient time to discuss it with other members of Climate Action California, but I expect that there is substantial support among the group for these comments.

1. One major concern is that this pathway if approved will result in very large increases in global soybean oil prices which will cause large amounts of land conversion to croplands in Argentina as well as increased food insecurity for many people. In fact there is evidence that this has already started. Attachment B-Land Use Change Analysis of Phillips 66 Application B0521 highlights that "No Significant Cropland Expansion is Observed in the Past Decade." This statement is based on a chart showing total crop acreage for Argentina from 2005 to 2020 as reported by FAO statistics. However, checking the given FAO link for MODIS data and comparing 2021 (the most recent year for which data is quoted) with 2020, herbaceous cropland area appears to have increased 1.3% over that year to 35,636 ha from 35,176 ha, while tree covered areas decreased 1.1% and grasslands decreased 0.9%. These are not insignificant amounts, but not surprising considering the global price of soybean oil increased almost 10% from 2019 to 2020 and [over 65% from 2020-2021](#). The global price of soybean oil increased again from 2021-2022 by over 20% so the increase in cropland area in Argentina is likely continuing.

The same Modis data showed the rate of increase in herbaceous cropland from 2011-2021 was 1.7%, so the increase is recent. Global annual price variation for soybean oil for the 5 years prior to 2019 varied much less and in some years declined. The massive increase in global soybean oil prices from 2020-2022 has been attributed to the large actual and projected increases in US production of renewable diesel from seed oils. Note the comment by the [American Enterprise Institute](#).

2. Attachment B of the Application notes that Argentina's double cropping for soybean production increased from 15% of the harvested area of soybeans in 2010-2011 to 32% in 2020-2021. It concludes that this increasing trend of double cropping will enable Argentina to increase soybean production to meet Phillips 66 Company's demands for soybean oil feedstock without further land expansion, but this is highly unrealistic. South American countries engage in double cropping to expand their production of food. According to the [World Bank's World Development Indicators](#) global population has been growing annually at 1.2%, while Argentina's population has been growing at an annual rate of 1% and Brazil's at 0.9%. Also, per capita calorie consumption and per capita oil consumption increase as country income level increases. Note the [USDA chart](#) on the growth of global per capita food production over time. Increases in double

cropping will be necessary to keep up with the rising demand for food due to global increases in population and income.

3. The Application lists the greenhouse gas emissions from indirect land use (ILUC) for Argentinian soybean oil at 29.10 gCO₂e/MJ and the carbon intensity, or total greenhouse gas emissions factor, for this pathway at 67.35 gCO₂e/MJ. The ILUC value is CARB's default value which is considerably lower than that used by the European Union (EU). While the EU and CARB agree on the carbon intensity values of transportation fuels made from fossil fuels, they disagree substantially on the carbon intensity values of crop-based biofuels made from oilseeds such as soybean oil because they estimate ILUC emissions very differently. The carbon intensity, or emissions factor with ILUC, for hydrotreated vegetable oil (HVO) using soybean oil for renewable diesel would be 182.9 gCO₂e/MJ if calculated in the European Union regardless of whether the source of the soybeans were from intermediate crops or not. Note Appendix D Baseline Data (page 45) in GAMS, [Transportation Carbon Intensity targets for the European Union-Road and Aviation Sectors, 2021](#) listed on the International Council on Clean transportation website. An uncertainty analysis by a third party should be performed to try to address the extreme difference in EU and CARB carbon intensity values for soy bean oil based renewable diesel. This uncertainty analysis should be available for public comment before approving this pathway application.

4. The Transportation Carbon Intensity Targets study mentioned above shows that the cheapest and fastest pathways to reducing carbon intensity in transportation are those that include no crop-based fuels. Please carefully read this study.