

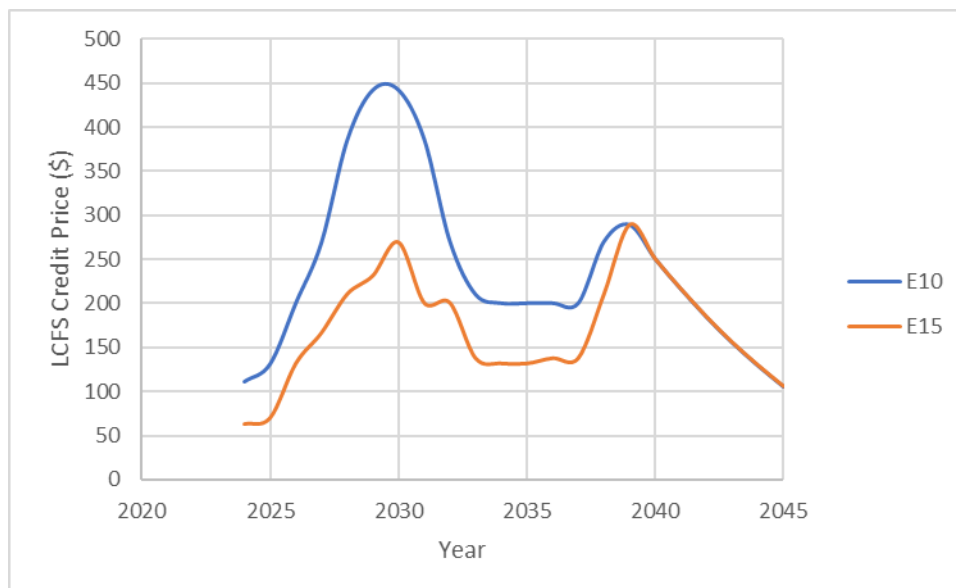
To: Chris Bliley, Growth Energy
From: Jim Lyons, Trinity Consultants
Date: July 14, 2023
RE: Impact of Allowing E15 Beginning in 2024 on Results of CARB’s CATS Modeling

At the request of Growth Energy, Trinity Consultants downloaded¹ and executed CARB’s “California Transportation Supply” (CATS) model for the base case where the ethanol content of gasoline is limited to 10% by volume (E10). Trinity then modified the CATS input file to allow for the use of gasoline containing up to 15% ethanol by volume (E15) beginning in calendar year 2024. More specifically, Trinity modified the “Maximum Percent Energy” value for “EthanolBlend” on the Blend Requirements tab of the input file to reflect the greater ethanol content of E15 using CARB’s published values for the energy density of CARBOB and denatured ethanol. Trinity then reran the CATS model with the modified input file. It should be noted that Trinity did not attempt to account for restrictions on the use of E15 in certain applications. e.g. non-road and older on-road vehicles. No other changes were made by Trinity to the CATS input file.

The results of a comparative analysis of the results obtained from CATS assuming E15 versus the result obtained for the E10 base case are summarized below. Given that Trinity was not charged with reviewing the data, assumptions and other features of the CATS model, no assessment of the root cause of the differences was performed.

Figure 1 presents the results for “total credit price” for the E10 and E15 cases. As shown, credit prices are substantially lower for the E15 case from 2024 through 2039 and then equal to the E10 case thereafter.

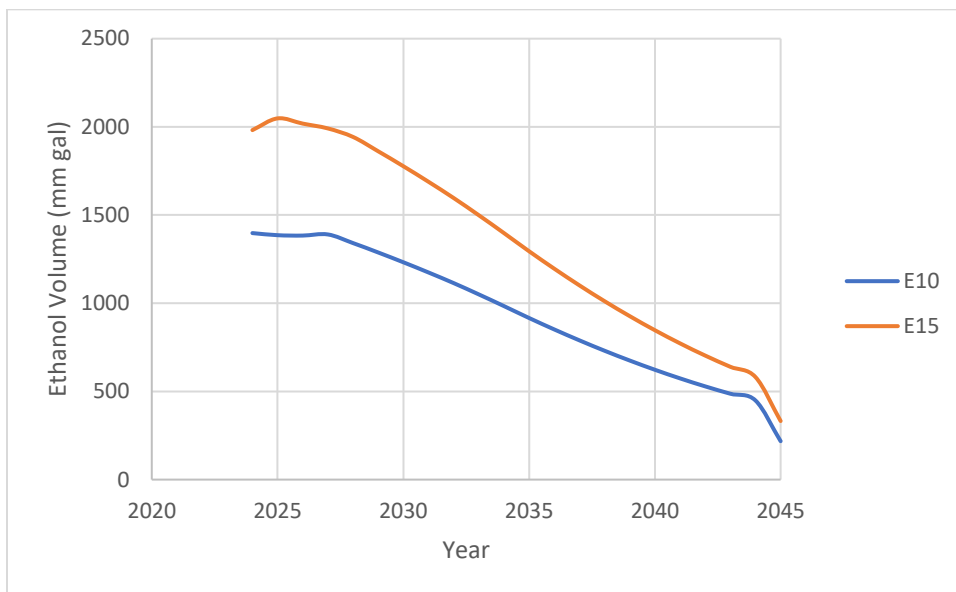
Figure 1 – Impact of E15 on LCFS Credit Prices 2024-2045



¹ Downloaded from the February 22, 2023 Workshop files at <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard/lcfs-meetings-and-workshops>

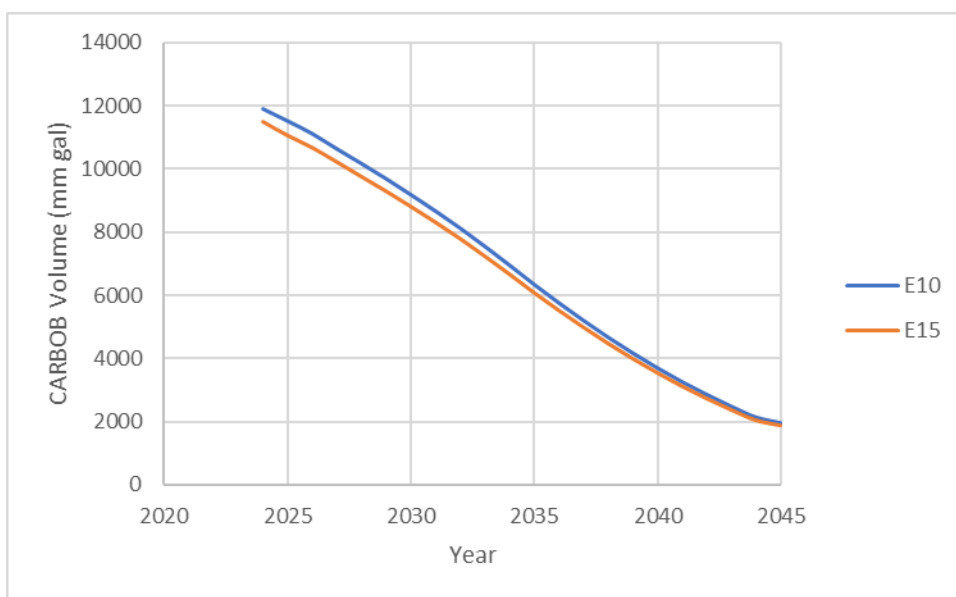
Figure 2 shows that under the E15 case the amount of ethanol estimated to be used in California is between about 40 and 50% higher than under the E10 case over the entire period from 2024 through 2045.

Figure 2 – Impact of E15 on Volume of Ethanol Used in California 2024-2045



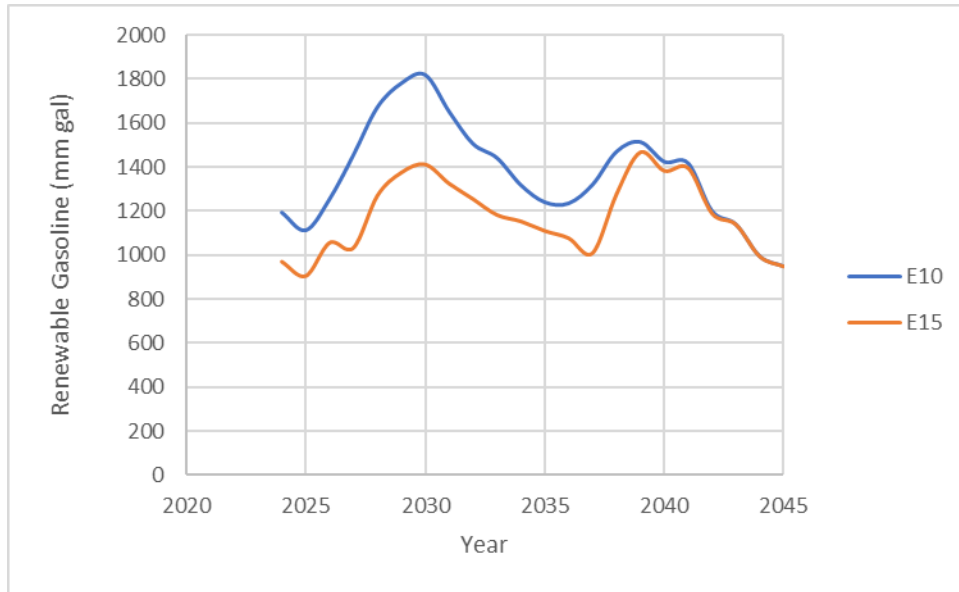
The amount of CARBOB used, which is shown in Figure 3, is as expected, about 4% lower under the E15 case compared to the E10 case.

Figure 3 – Impact of E15 on Volume of CARBOB Used in California 2024-2045



Renewable gasoline use was also lower with E15 compared to E10 over most of the study period as shown in Figure 4.

Figure 4 – Impact of E15 on Volume Renewable Gasoline Used in California 2024-2045



There was no impact of E15 on the assumed volumes of biodiesel, hydrogen, electricity, or natural gas across the entire study period. There were, however, impacts of E15 on the amounts of diesel, renewable diesel, as well as conventional and alternative jet fuel assumed to be used in California. Use of conventional diesel increased with E15 while the use of renewable diesel decreased. The opposite behavior was observed for jet fuel as E15 decreased use of conventional jet fuel and increased the use of alternative jet fuel although total jet fuel use did not change. The differences in estimated volumes of alternative jet fuel use in California for the E10 and E15 cases are shown in Figure 5.

Figure 5 – Impact of E15 on Alternative Jet Fuel Use California 2024-2045

