

ESSENTIAL FOR CUTTING CARBON

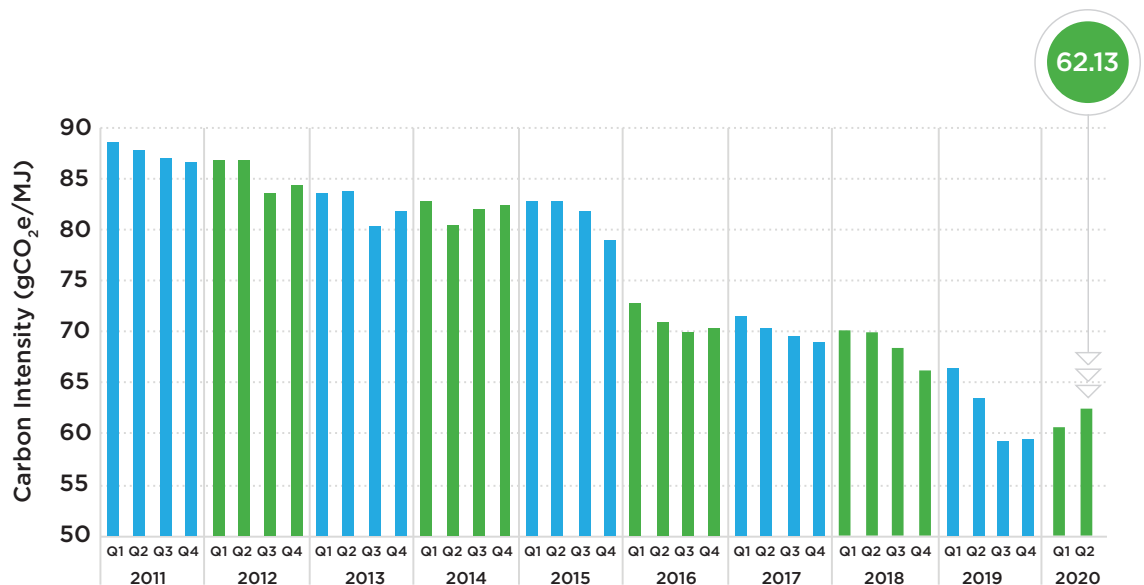
The rise of global temperatures and cataclysmic natural disasters and weather events, from droughts to floods to wildfires, have hastened and intensified policy discussions around carbon's role in climate change. Everyone is looking for answers and for decades, renewable fuels like ethanol have been part of the solution. State and federal agencies agree that grain-based ethanol cuts greenhouse gas emissions significantly—by 35 to 50 percent compared to gasoline. Emerging technologies promise to boost that reduction to around 70 percent in just the next few years, according to USDA. And ethanol made from corn kernel fiber and other cellulosic feedstocks is already delivering reductions of 80 percent or more.

With ethanol, we don't have to wait and hope for major technological or economic breakthroughs; the fuel is available now at a low cost to drive decarbonization of our liquid fuels.

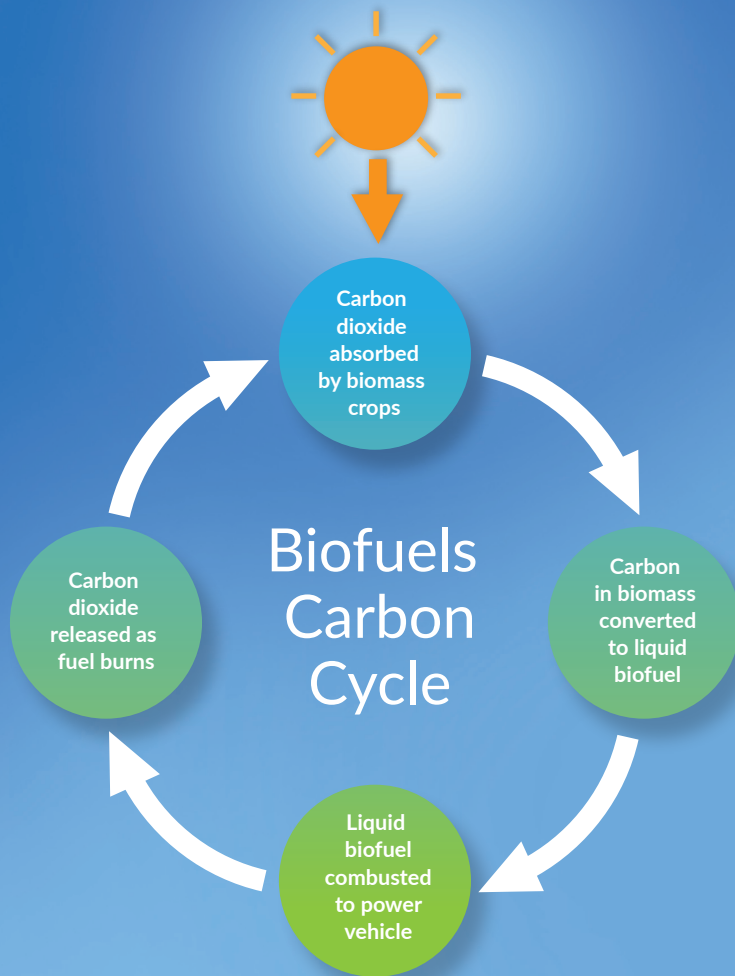
How does this work? Plants that are ultimately made into renewable fuels absorb carbon dioxide from the atmosphere as they grow, and that same amount of carbon dioxide is re-released when the fuel is produced and combusted in an engine. In this way, ethanol and other renewables simply recycle atmospheric carbon. Even when the energy use and emissions related to the full production process are accounted for, ethanol delivers significant GHG savings compared to the fossil fuels it replaces.

Further, by displacing hydrocarbon substances like aromatics in gasoline, ethanol helps reduce emissions of air toxics, along with particulate matter, carbon monoxide, nitrogen oxides and exhaust hydrocarbons. These pollutants cause smog and ground-level ozone and adversely affect human health. Cutting these emissions results in lower incidence of respiratory illness and asthma, heart disease, lung disease and cancer—and ultimately fewer premature deaths.

CARBON INTENSITY OF STARCH-BASED ETHANOL IN CALIFORNIA GASOLINE



Source: RFA using California Air Resources Board data



New Studies Track Significant GHG Emissions Reductions

Research from Environmental Health & Engineering Inc., released in late January, shows that greenhouse gas emissions for ethanol are 32 percent to 62 percent lower than gasoline, with a central best estimate of 46 percent.

- The research, by scientists affiliated with Harvard and Tufts universities in Massachusetts, delivers a transparent, state-of-the-science assessment on lifecycle analyses of corn starch ethanol in the United States.
- The study credits recent efficiency improvements and the adoption of new technologies for the steady reduction in the lifecycle carbon intensity of corn ethanol.
- Importantly, EH&E's assessment also shows that carbon emissions from converting prior land uses to corn farming make up only 7 percent of the biofuel's total GHG emissions—a much smaller amount than generally recognized.

THE USE OF ETHANOL IN GASOLINE IN 2020 REDUCED CO₂-EQUIVALENT GREENHOUSE GAS EMISSIONS FROM THE TRANSPORTATION SECTOR BY 47.3 MILLION METRIC TONS. THAT'S EQUIVALENT TO REMOVING 10.1 MILLION CARS FROM THE ROAD FOR AN ENTIRE YEAR, OR ELIMINATING THE ANNUAL EMISSIONS FROM 12 COAL-FIRED POWER PLANTS.

Source: RFA analysis using U.S. Dept. of Energy GREET model

Also in January, a study by Life Cycle Associates confirmed that the Renewable Fuel Standard has resulted in aggregate GHG reductions from the use of biofuels that exceed the EPA's original projections. The RFS, as expanded in 2007, has resulted in cumulative CO₂ savings of 980 million metric tons. This is due to the greater-than-expected savings from corn-based ethanol and other biofuels and occurs even though cellulosic biofuels have not met legislative targets. In addition, LCA research indicates GHG emissions from petroleum are higher than the EPA baseline.

