

# ETHANOL: LOW CARBON FUEL

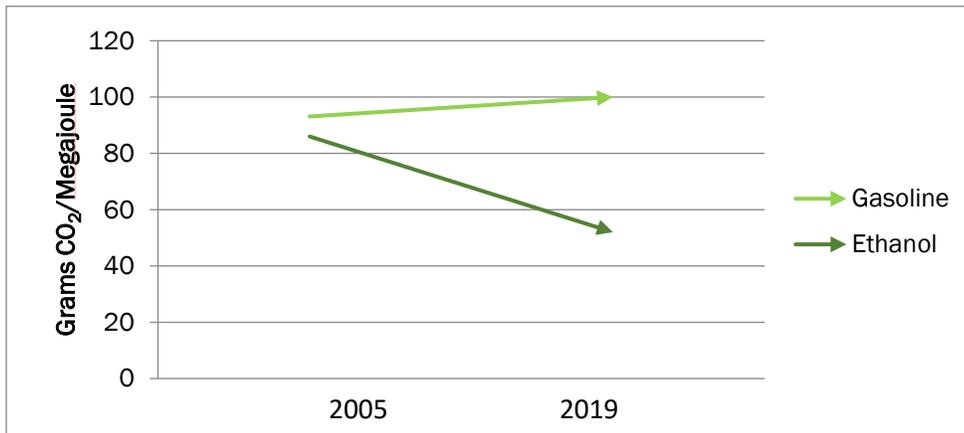


## Ethanol Is an Immediate Climate Solution

- Ethanol significantly lowers carbon emissions and cleans the air.
- Ethanol makes vehicles more fuel efficient when used with advanced engines.
- Ethanol is a vital pathway for rural areas and agriculture to help address climate change.
- Ethanol is available now, at less cost for drivers.

## Ethanol’s Shrinking Carbon Footprint

- The Department of Energy’s Argonne National Laboratory GREET model for 2019 shows ethanol’s average carbon intensity is 41 percent lower than gasoline’s carbon intensity.
- With continued voluntary, on-farm sustainability improvements and use of the most updated science and lifecycle emissions accounting such as GREET, ethanol’s carbon intensity will only continue to decline.
- New analysis from [Environmental Health and Engineering](#) finds ethanol cuts emissions by 46 percent compared to gasoline.

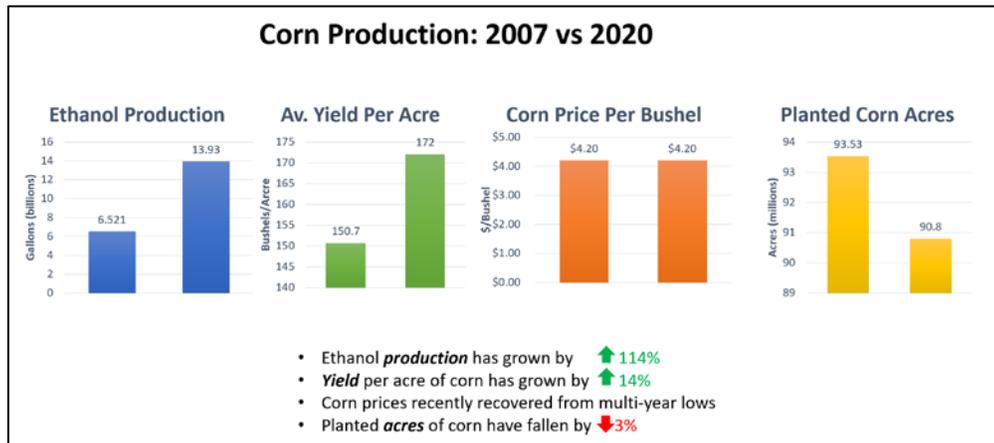


## Ethanol Improves Air Quality and Human Health

- Increased volumes of ethanol in fuel displace the most harmful compounds in gasoline. These aromatic hydrocarbon additives (such as benzene, toluene, ethylbenzene, xylene – or BTEX) have high cancer-causing potential and are a major contributor to particulate matter emissions causing respiratory and cardiovascular harm, including premature death, according to the American Lung Association
- According to EPA’s Fuel Trends Report: Gasoline 1996-2016, “Ethanol’s high octane value has also allowed refiners to significantly reduce the aromatic content of the gasoline.”
- When ethanol blending increased from 1 percent to at least 10 percent, EPA data shows that aromatics’ share of gasoline volume dropped almost 6 percentage points, from nearly 25 percent to 19.3 percent and benzene volume fell from 0.99 percent to 0.58 percent between 2000 and 2016.
- Higher ethanol blends improve air quality and therefore provide health benefits. Every additional percentage of ethanol blended per fuel gallon, such as moving to a 15 percent ethanol blend, replaces these most harmful hydrocarbon aromatic components of gasoline.

## Farm Productivity = Low Carbon Fuel

- Corn-based ethanol can reach net zero emissions, with soil carbon sequestration on farms and carbon capture and other improvements in the ethanol production process going forward.
- Low-carbon ethanol offers an immediate and affordable solution and represents an important pathway for agriculture and rural America to contribute to climate solutions.
- Farmers are producing more corn with less land and fewer resources. Corn production has doubled while primary nutrients per bushel have been cut in half. Renewed focus on soil health practices reduces erosion, holds nutrients, and sequesters more carbon in the soil.



## Low Carbon, High Octane Solutions

- The Renewable Fuel Standard (RFS) is the only federal statute that requires greenhouse gas (GHG) emission reductions. Since 2008, the RFS has reduced GHG emissions by 980 million metric tons, exceeding projections.
- Building on the success of the RFS, today’s low carbon ethanol is positioned, with the right policies, to further decarbonize liquid fuels. The transportation mix is changing, but low carbon liquid fuels are necessary to decarbonize transportation successfully and affordably, and ethanol is available now.
- Key policy options that enable ethanol to further decarbonize the transportation sector include:
  - **Optimize the RFS**, by accurately updating lifecycle GHG accounting and supporting growth in RFS volume rulemakings for 2022 and beyond.
  - **Next Generation Fuels Act**, transitioning the gasoline supply to a lower carbon, high octane fuel to reduce emissions, increase vehicle fuel efficiency and remove barriers to higher ethanol blends.
  - **Low Carbon Fuel Standard/Clean Fuel Standard**, a market-based policy that rewards fuels that offer GHG reductions.
- The House Select Committee on Climate identified a Low Carbon Fuel Standard/Clean Fuel Standard (CFS) as a policy that would reduce emissions. NCGA supports market-based clean fuel policies that incentivize low carbon fuels, including ethanol.
- To be effective and create a level playing field for all solutions, a CFS must be technology and feedstock neutral, based on a consistent carbon performance standard and accompanied by complementary policies that increase market access for higher ethanol blends.
- Market-based competition will advance the lowest cost solutions to decarbonizing transportation, and equity in the measurement of carbon intensity will put all low-carbon options on a level playing field to replace more high-carbon fuels.