

# THE NET-ZERO SOLUTION

In 2021, RFA's member producers unanimously pledged to produce ethanol with net-zero carbon emissions, on average, by 2050 or sooner. Along the way to net-zero, RFA's members also committed to achieving an average carbon reduction of 70 percent compared to gasoline by 2030. In 2022, RFA began laying the first flagstones on the road to net-zero, releasing a study that identified five distinct technology pathways to this goal.

The report, *Pathways to Net-Zero Ethanol: Scenarios for Ethanol Producers to Achieve Carbon Neutrality by 2050*, identified five actions that would constitute a "core pathway" to net-zero emissions.

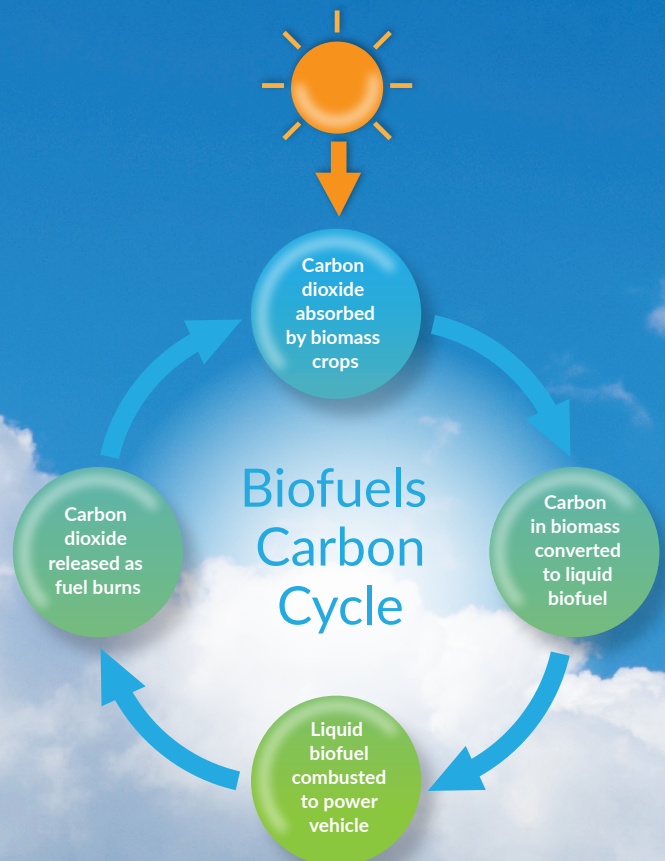
- Renewable energy use by corn and ethanol producers;
- Expanded adoption of corn kernel fiber fermentation at dry mills;
- 'Better-than-business-as-usual' industry-wide efficiency improvements and ethanol yields;
- Carbon capture and sequestration by ethanol facilities; and
- Expansion of conservation tillage and other low-carbon practices by corn growers.

Two of these five actions in particular will have the most impact, by far, on reaching net-zero: Carbon capture and sequestration, and expanded renewable energy use at farms and biorefineries.

## Flying High with Low-Carbon Ethanol

The low-carbon benefits of ethanol are reaching new markets as ethanol producers realize the sky's the limit; RFA sees sustainable aviation fuel, or SAF, as an enormous opportunity. Significant investments are already being made in ethanol-to-jet facilities, and we can expect the first commercial-scale production to begin within the next year or two. RFA is laser-focused on ensuring proper implementation of the SAF tax credit in the Inflation Reduction Act and making sure that ethanol-based SAF can fully participate in the Renewable Fuel Standard and Low Carbon Fuel Standard programs.

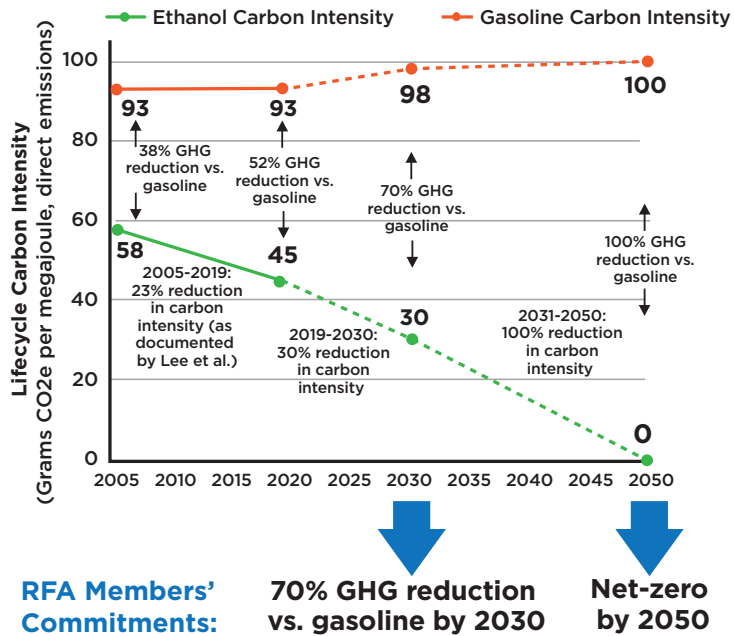
As questions continue to arise around the supply adequacy of other SAF feedstocks, RFA sees ethanol's broad availability, low carbon intensity, and low price as key advantages that will make ethanol-to-jet a very attractive pathway to sustainable aviation fuel.







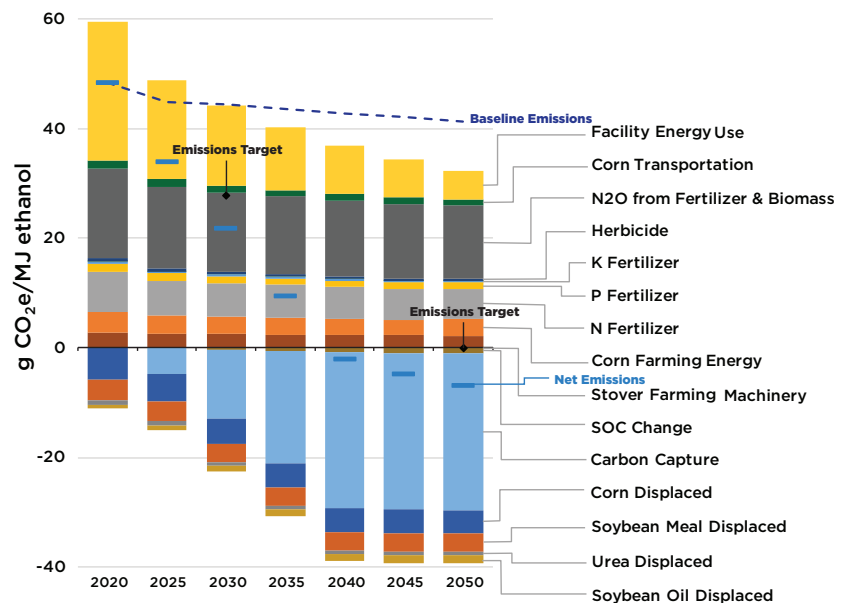
## ACTUAL 2005 and 2019 ETHANOL CARBON INTENSITY (DOE-Argonne) AND RFA GOALS FOR 2030 AND 2050



Source: RFA based on data provided in Lee, U., Kwon, H., Wu, M. and Wang, M. (2021), *Retrospective analysis of the U.S. corn ethanol industry for 2005-2019: implications for greenhouse gas emission reductions*. Biofuels, Bioproducts & Biorefining.

By 2050, the ethanol industry can reach net-zero carbon emissions, on average, with workable improvements both on the farm and at the biorefinery, especially with renewable energy use and carbon capture and sequestration.

## CORE PATHWAY TO NET-ZERO EMISSIONS



Source: "Pathways to Net-Zero Ethanol: Scenarios for Ethanol Producers to Achieve Carbon Neutrality by 2050," Isaac Emery, Ph.D., of Informed Sustainability Consulting LLC, February 14, 2022.