

A SPECIAL ILLINOIS CORN PUBLICATION

# TODAY'S FUEL TOMORROW'S FUTURE

**FARMERS ARE  
A PART OF THE  
GLOBAL CLIMATE  
SOLUTION**

**ILCORN.ORG**



# FUELING NEW GROWTH /

## **America's corn farmers are the best in the world.**

Unsurpassed for quality, reliability, and availability, our corn farmers are literally outstanding in their field.

Over the past five years, Illinois farmers have grown an average of 2.14 billion bushels of corn. That's 42 percent more than the 1996-2000 average. Illinois corn farmers continue to be more productive, growing about 2 bushels more per acre each year.

So supply is growing. With your Illinois corn checkoff dollars, the Illinois Corn Marketing Board is taking on the demand side of the profit-

making both fuel and engine efficiency critical pieces in reducing the GHG intensity of the transportation sector.

## **Enter corn-ethanol as octane.**

Your fields are growing the very octane on which these fuel and vehicle innovations depend.

By increasing the compression ratios of engines and optimizing them to run on HOLC fuels, automobile manufacturers can increase vehicle efficiency and reduce emissions. The U.S. Department of Energy's national

labs have confirmed that these new engines operating on mid-level blend (MLB) ethanol fuels could achieve, depending on the octane level, 5-10 percent

*U.S. corn carryout for market year 2019-2020 was 1.92 billion bushels. Five billion gallons of ethanol takes about 1.8 billion bushels of corn.*

ability equation with innovative approaches, supporting research to design the new High Octane Low Carbon (HOLC) future fuel. This new fuel will power future vehicles that are lighter weight with high compression engines to improve efficiencies and reduce harmful greenhouse gas (GHG) emissions that contribute to climate change.

While internal combustion engines are more efficient and cleaner than ever, the transportation sector is still responsible for 27% of GHG emissions, with half of all transportation emissions coming from light-duty passenger vehicles, like the ones we all drive every day.

The Energy Information Administration predicts the internal combustion engine will be the dominant engine for the next several decades,

improvement in vehicle efficiency with even larger reductions in greenhouse gas emissions.

The introduction of HOLC liquid transportation fuels into North America will expand ethanol markets for Illinois corn farmers. Analyses have shown that with a 50% adoption rate of E25 in new vehicles with high compression engines, ethanol usage in 2030 and beyond could increase as much as 5 billion gallons.

## **Let's state that again.**

Ethanol usage could increase by 5 billion gallons or more.

U.S. corn carryout for market year 2019-2020 was 1.92 billion

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# IMPROVING PROFITABILITY

bushels. Five billion gallons of ethanol takes about 1.8 billion bushels of corn.

## Do we have your attention now?

Researchers from Argonne National Laboratory, the National Renewable Energy Laboratory, and Oak Ridge National Lab conducted coordinated studies to address the opportunities and challenges of deploying high octane fuels with mid-level ethanol blends to the passenger vehicle fleet.

The national lab study showed that 20 to 40% ethanol in conventional gasoline could provide significant octane boost and GHG reduction, and use of a higher octane MLB can provide improved acceleration performance in Flex Fuel Vehicles.

More importantly, the introduction of this high-octane MLB could provide an optimized fuel source for the much more efficient internal combustion engines carmakers are developing.



## WHAT IS OCTANE?

Octane is the number you see at a gas pump, most frequently indicated by a yellow label with the numbers 87, 89, or 91.

The higher the octane number, the more likely the fuel will resist pre-ignition when compressed in the cylinder. The higher the octane rating, the less likely an engine's propensity to knock.

Knocking causes severe engine damage at worst, and at best, is an audible indicator of poor engine tuning, or performance with the fuel. As a result, engine management systems today

incorporate knock sensors to adjust ignition timing when necessary to accommodate for the inconsistencies in gasoline quality.

How does corn-based ethanol fit into the octane discussion?

Corn-based ethanol is the lowest cost, highest quality, non-toxic source of octane available in the world.

Illinois Corn Marketing Board, by investing your checkoff dollars, is doing the legwork to prove that IL Corn fields aren't just growing record levels of corn, they're growing octane for the fuels and vehicles of the not-too-distant future.

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# But what about America's push for electric?

The idea that electric fuels and vehicles will save our nation from our climate problem is a challenge facing agriculture today. We must face this challenge head on.

The solution lies in proving that corn farmers and corn-based ethanol can be part of the climate solution if allowed equal access to the marketplace.

Corn-based ethanol offers immediate greenhouse gas reduction benefits for our nation and our world. This is a proven fact. The USDA and Harvard University estimate an almost 50 percent reduction in GHG emissions in two recent independent studies of corn-based ethanol.

Given a level-playing field, corn-based ethanol can compete.

Farmers must advocate for a technology neutral climate bill as op-

posed to an electrification bill. A technology neutral bill would simply set a GHG emission reduction standard and allow any technology that can meet the standard to compete in the marketplace. An electrification bill picks a winning technology and forces compliance.

When asked, will you be ready to call your elected officials to advocate for a technology neutral climate bill? And will you be a farmer that is implementing conservation practices that empower future GHG emissions reductions for corn-based products, like ethanol?

Now is not the time to fear losing ethanol markets. We have infrastructure, a U.S. vehicle fleet almost completely made up of internal combustion engines, and consumer familiarity on our side. We need only to aggressively advocate for market access. Together, we can accomplish a technology-neutral climate bill.



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# Your corn checkoff: Innovating relationships

IL Corn knows even the best ideas won't gain much traction without consensus, and we certainly don't have the most leverage in conversations about motor vehicles and motor fuels.

That's why we diligently grow relationships with other stakeholders in the discussion of High-Octane Low Carbon (HOLC) fuels.

As an early innovator in these discussions, IL Corn led development of what's now known as the Ag Auto Ethanol working group. The conversations aren't always easy, but they're always necessary. And they are yielding results.

For example, the country's largest automakers see a consensus-building approach as crucial to a move to high-octane future fuels for future vehicles:

**Ford:** Tony Ockelford, director of product and business strategy for Ford's powertrain operations, outlined two ways to elevate the octane debate: the auto industry needs to educate drivers on the benefits of higher octane and how it enables cleaner and more powerful and efficient engines, and continue collaborating. "100 RON has been on the table for a long time... The only way we will ever get there is to continue to push and work in a collaborative way."

**GM:** Dan Nicholson, vice president of General Motors Propulsion

Systems, regularly lobbies governments and the petroleum industry to raise octane. "Higher octane is necessary for better engine efficiency...It is a proven low-cost enabler to lower CO2. 100 RON fuel is the right fuel for the 2020-25 timeframe...If we are going to get



to an optimal, societal CO2 solution, we will need to work together."

Who are the members of the Ag Auto Ethanol working group?

- **Auto manufacturers:** Chrysler, Ford, General Motors, Mercedes, Toyota, VW
- **Agriculture:** IL Corn, John Deere, Bayer, the National Corn Growers Association, many state corn organizations
- **Ethanol:** American Coalition for Ethanol, Growth Energy, Renewable Fuels Association, ICM, Poet Energy, ADM

## ***The adoption of higher blends of ethanol promotes better air quality and supports public health goals.***

- *Petroleum-based aromatics have been shown to contribute to thousands of mortalities in the United States. Ethanol provides a cleaner substitution.*
- *Increasing the volumes of ethanol to a midlevel blend (E20-E40) corresponds to a significant reduction in harmful particulates and carbon monoxide, which ultimately improves human health.*
- *Ethanol improves urban visibility and moderates the formation of smog.*

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# The Next Generation Fuel Act:

The Next Generation Fuels Act, introduced into Congress by Rep. Cheri Bustos on September 23, 2020, would create a revolutionary new fuel standard that leverages greater fuel octane to reduce carbon emissions from transportation, improve air quality and increase demand for biofuels.

Fuels with greater levels of octane increase performance and have the potential to make engines more fuel-efficient. This legislation establishes a minimum octane standard for gasoline and requires sources of the added octane value to reduce carbon emissions by at least 30 percent compared to baseline gasoline.

Furthermore, the legislation limits the use of harmful aromatics in meeting this new higher octane standard, as well as in current market gasoline.

Corn based ethanol is currently the only fuel source that meets all the criteria outlined in this bill.

Due to ethanol's high octane rating, low-carbon, high-octane ethanol blends result in both additional fuel efficiency and significant greenhouse gas (GHG) reduction benefits. Ethanol is also priced lower than gasoline, making it the most cost-effective octane source.

By requiring the new high octane fuel to utilize low-carbon sources, the Next Generation Fuels Act will decarbonize liquid fuels as vehicle technologies advance. This requirement, coupled with a new limit on harmful aromatics content, ensures that progress already made to lower emissions continues.

Using more petroleum-based sources to increase fuel octane would produce more carbon emissions, erase GHG reduction benefits from improved fuel economy and result in more emissions of harmful hydrocarbon aromatics, which degrade air quality and respiratory health.

Illinois currently has 13 ethanol plants that use almost 685 million bushels of corn to produce just under two billion gallons of ethanol every year. These plants work to provide an environmentally friendly fuel source while using locally grown resources that are already being produced by American farmers.

With these principles in mind, the agriculture, ethanol and automotive industries are working together to ensure that these fuels are readily available to provide the best environmental performance in the field to customers by 2024.

***Your corn organizations are working to get this bill reintroduced in the 117th Congress.***



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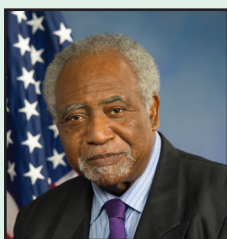
# A technology-neutral climate plan

## THANKS TO OUR ETHANOL SUPPORTERS

IL Corn and the Illinois corn farmers it represents remain grateful to these members of the Illinois delegation who have supported corn-based ethanol in the past through positive votes in Congress.



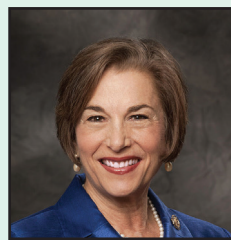
Sen. Tammy Duckworth



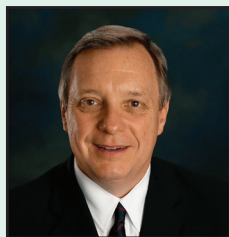
Rep. Danny Davis (Dist. 7)



Rep. Raja Krishnamoorthi (Dist. 8)



Rep. Janice Schakowsky (Dist. 9)



Sen. Richard Durbin



Rep. Rodney Davis (Dist. 13)



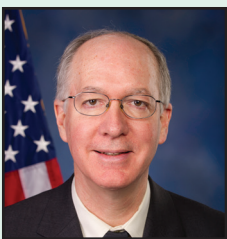
Rep. Darin LaHood (Dist. 18)



Rep. Brad Schneider (Dist. 10)



Rep. Mike Bost (Dist. 12)



Rep. Bill Foster (Dist. 11)



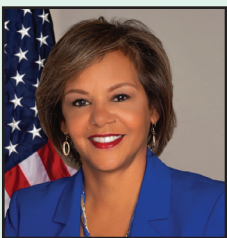
Rep. Dan Lipinski (Former Dist. 3)



Rep. John Shimkus (Former Dist. 15)



Rep. Cheri Bustos (Dist. 17)



Rep. Robin Kelly (Dist. 2)



Rep. Mike Quigley (Dist. 5)



Rep. Lauren Underwood (Dist. 14)



Rep. Sean Casten (Dist. 6)



Rep. Adam Kinzinger (Dist. 16)



Rep. Bobby Rush (Dist. 1)

With a special thanks to Rep. Cheri Bustos for her leadership on the Next Generation Fuels Act!

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# *Why should farmers care about High Octane Low Carbon fuels?*

## Domestic market demand

A high-octane low carbon fuel in the marketplace, once fully implemented, increases long-term annual ethanol usage by more than 5 billion gallons. That's equal to more than 1.8 billion bushels of new annual corn demand.

## Environmental impact

In 2018, the use of ethanol in gasoline reduced CO2-equivalent Greenhouse Gas Emissions from vehicles in the U.S. by 55.1 million metric tons. That's equal to removing 11.7 million cars from the road for an entire year!

## Affordability

Today, regular gasoline without ethanol is often priced at well over \$0.50 higher compared to fuel containing a minimum of E10. Higher blends of ethanol in a future high-octane fuel would allow consumers access to a high octane fuel without the high octane price premium we see today.

## Future engine performance

Automakers are asking for a higher-octane fuel standard allowing new technology capable of delivering substantial gains in engine efficiency and performance.

## Available now

Ethanol blends are available now to make this high octane low carbon future a reality, as well as infrastructure to quickly move us towards a climate solution.



# HELP FUEL THE FUTURE

## YOU HAVE THE POWER.



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