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Outlook

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Global Demand for Fuel Ethanol Through 2030

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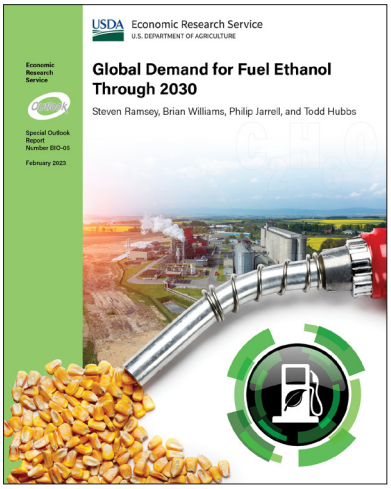
What Is the Issue?



Ethanol manufacturers use about 40 percent of the U.S. corn crop for ethanol and related co-products, with the majority of the ethanol being consumed in the domestic transportation fuel market. After seeing strong growth for several years, ethanol-based demand for corn plateaued over the last decade. Recently, demand for ethanol saw reductions in response to measures taken to combat the Coronavirus (COVID-19) pandemic, such as pandemic-related restrictions, remote work and school, and other social distancing efforts. Though U.S. ethanol consumption has largely recovered from these COVID-19 impacts, increased adoption of hybrid or electric vehicles and continued fuel efficiency gains in gasoline vehicles may decrease domestic gasoline consumption, which in turn could decrease fuel ethanol demand. Moving forward, ethanol policies in export market countries may be an important determinant in whether total demand for U.S. corn-based ethanol increases or decreases. This report has two overarching objectives: first, to summarize the current U.S. and international fuel ethanol markets, and second, to explore potential market opportunities for U.S. ethanol via projections of future fuel ethanol demand in international markets. In the report, USDA, Economic Research Service (ERS) authors make projections under a "Historical Blends" (HB) scenario, where countries continue to blend ethanol at historical rates, and a "Targeted Blends" (TB) scenario, where countries fully meet stated ethanol blending targets or mandates.

What Did the Study Find?

The U.S. Department of Energy's Energy Information Administration (EIA) projections to 2030 indicate that U.S. motor gasoline consumption is expected to see changes ranging from a 4.5-billion-gallon decrease (3.3 percent) to a 7.2-billion-gallon increase (5.3 percent) from 2021 levels. These figures correspond to average consumption changes of between -499 million and 797 million gallons per year. EIA projections also indicate that U.S. consumption of ethanol in motor gasoline and E85 is expected to increase between 196 million gallons (1.4 percent) and 1.4 billion gallons (10.4 percent) above 2021 levels, depending on U.S. economic growth over the decade. The projected increase in ethanol consumption across all scenarios—despite falling gasoline consumption in some scenarios—is due in part to EIA's assumption that the Renewable Fuel Standard will increase total U.S. consumption of renewable fuels.

Total global demand for gasoline is expected to stagnate over the next decade, leaving changes in blend rates—domestically or abroad—as the main determinant for future changes in fuel ethanol demand. The second part of this study focused on blend rates outside of the United States and the impact that non-U.S. countries meeting their targets has on projected demand for fuel ethanol.

- Under the "Historical Blends" (HB) scenario, international fuel ethanol consumption is projected to increase by 0.75 billion gallons (5.7 percent) between 2018 and 2030 and by 0.95 billion gallons (7.4 percent) between 2021 and 2030. The projected 2018 to 2030 increase is primarily driven by an increased demand of 234 million gallons in India, 276 million gallons in Brazil, and 347 million gallons in China. The projected 2021 to 2030 increase is primarily driven by an increased demand of 113 million gallons in Thailand, 193 million gallons in China, and 739 million gallons in Brazil.
- Under the "Targeted Blends" (TB) scenario, international fuel ethanol consumption is projected to increase by 23.7 billion gallons (180 percent) between 2018 and 2030 and by 23.4 billion gallons (173 percent) between 2021 and 2030. The largest increases from 2018 to 2030 are projected to occur in Canada (3.3 billion gallons), China (5.6 billion gallons), and Brazil (6.4 billion gallons). The largest increases from 2021 to 2030 are also projected to occur in Canada (3.4 billion gallons), China (5.5 billion gallons), and Brazil (6.9 billion gallons).

Taken together, the HB and TB scenarios present an evaluation of fuel ethanol consumption outside the United States over the next decade. The HB scenario represents a USDA, Economic Research Service estimate under current trends, and the TB scenario represents a potential upper boundary based on certain policy and market scenarios. The study does not assign the likelihood of any policy being implemented or discontinued. USDA's ERS researchers did not model a scenario where countries reduce their ethanol consumption as there was not an established non-ad hoc approach to determining which countries would reduce consumption and by how much.

How Was the Study Conducted?

USDA's ERS researchers estimated the demand for motor gasoline and fuel ethanol using data and projections from the EIA, USDA's Foreign Agricultural Service (FAS), and the International Energy Agency (IEA). The researchers used projections for U.S. consumption of fuel ethanol and motor gasoline from EIA's Annual Energy Outlook 2022. International demand projections in the report are based on a combination of historical fuel ethanol consumption data from EIA and USDA's FAS and energy-demand projections from IEA's World Energy Outlook 2020. The researchers obtained blending targets or mandates for countries that have historically consumed fuel ethanol.

This study focused primarily on potential demand for fuel ethanol but not current or forecasted future ethanol production. Additionally, though non-fuel ethanol is covered briefly, data limitations prevented a more thorough analysis of these markets.