Where is U.S. Ethanol Going?

Angélica Marrero, Office of Industries
Angelica.Marrero@usitc.gov, (202) 205-2519

The U.S. ethanol industry has adopted a goal of substantially increasing ethanol production in the next few years. Domestically, ethanol consumption has been relatively flat and dependent on gasoline consumption, as it responds to the renewable fuel standard (RFS) mandate. Recently, the U.S. government has initiated a rulemaking process that may expand domestic ethanol consumption. However, the industry has also looked to export markets as the key to increasing demand for U.S. ethanol and supporting increased production. This executive briefing on trade will briefly explain recent developments affecting the U.S. ethanol industry and explore potential markets for U.S. ethanol, particularly in Asia and Latin America.

The Renewable Fuel Standard

The Renewable Fuel Standard (RFS) is a mandate by Congress to "reduce gas emissions and expand the domestic renewable fuels sector while reducing reliance on imported oil." The RFS was introduced under the Energy Policy Act of 2005 and is administered by the U.S. Environmental Protection Agency (EPA). In short, the RFS obliges refiners or importers of gasoline or diesel to blend biofuels with their conventional fuels. The law established blending requirements by type of biofuel to incentivize production of cleaner alternatives.[1] The amounts mandated by law, called the renewable volume obligations (RVOs), are adjusted each year and determined by the EPA, with a maximum RVO for ethanol at 10 percent of the renewable fuel blended with conventional fuel (E10), known as the "blend wall," which is the level deemed safe for the U.S. fleet to operate.[2] Renewable Identification Numbers (RINs) are generated for each gallon of biofuel produced and are exchanged between biofuel producers and conventional fuel suppliers, which in turn use them to demonstrate compliance with the RFS to EPA. Refiners or importers that do not meet the mandate are required to purchase RIN credits for each gallon of biofuel not blended with conventional fuel.[3] The RFS has been the main driver of U.S. ethanol production in the last decade.[4]

The domestic industry

U.S. biofuel production has increased significantly since the RFS was established in 2005. Despite this strong overall growth, most of this development has been concentrated in the conventional biofuel sector, particularly fuel ethanol, while growth in advanced and cellulosic biofuels, as well as biodiesel, has been slow. Fuel ethanol production has increased 463 percent since 2003 (figure 1), and has become consolidated as a mature industry in the United States. Currently, the United States is the largest producer of ethanol in the world. U.S. ethanol production is mainly destined for domestic consumption, and has increased in response to the RFS, rising 251 percent from 2005–17. However, ethanol consumption

[1] The reduction in greenhouse gas emissions (GHG) achieved by the different types of renewable fuels, compared to petroleum, varies. Cellulosic fuels achieve a 60 percent reduction, advanced fuels and biodiesel achieve 50 percent reduction, while conventional renewable fuels (corn ethanol) achieve a 20 percent reduction in GHG emissions.

[2] Currently, all gasoline engine vehicles can use E10. Since the energy content of ethanol is about 33 percent lower than that of gasoline, higher ethanol blends can reduce the fuel efficiency —the distance traveled for a specific amount of fuel consumed— of a vehicle that is not optimized to run on ethanol.

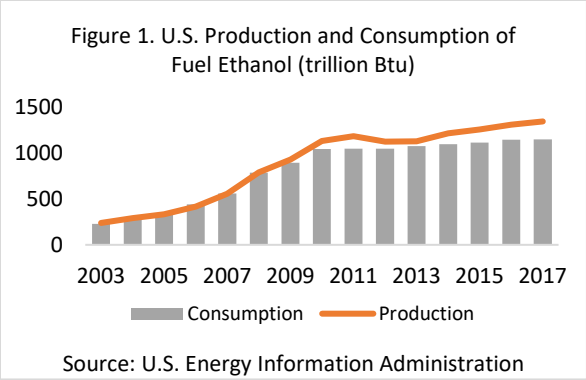
[3] EPA can grant waivers to small producers that show financial hardship as a consequence of the RFS.

[4] EIA, "Positive U.S. ethanol margins are driving ethanol production growth," March 6, 2018 https://www.eia.gov/todayinenergy/detail.php?id=35212.

domestically has increased at a slower rate, about 1.4 percent on average, since 2010 (figure 1) as it reaches the blend wall.

E15: changes in domestic consumption

In October 2018, the EPA began the rulemaking process to allow production of E15 (conventional fuel blended with up to 15 percent of ethanol)[5] all year long. Currently, production of E15 is banned in the summer months —from June 1 to September 15— for environmental concerns, particularly because it is linked to an increased presence of smog when blended with gasoline. The industry believes that allowing blending of E15 year-round, combined with increased promotion and marketing of the product in the country, will increase domestic demand and encourage retailers to invest in the infrastructure necessary to handle higher blends of ethanol. The U.S. Department of Agriculture is also incentivizing investment in infrastructure for E15 and higher ethanol blends through the Biofuel Infrastructure Partnership, which combines federal, state, and private sector funding.



Global biofuel mandates: an opportunity for the industry

Exports of U.S. fuel ethanol have grown significantly since 2010, as production started to exceed domestic consumption. Currently, about 10 percent of the total U.S. ethanol production is exported. Canada is the main destination for U.S. ethanol, accounting for 65 percent of total U.S. exports in 2017, followed by China, which accounted for 8 percent.[6] In general, U.S. ethanol exports fluctuate by year and country, as countries adopt renewable fuel mandates. About 65 markets have biofuel blending mandates in place and around 10 countries that are currently importing U.S. ethanol, such as Colombia and the Philippines, announced their intent to expand their policies within the last year. Additionally, the U.S. industry has increased marketing and promotion of U.S. ethanol in countries that are not currently importing the product. Mexico, Vietnam, and Ireland, for example, expressed their intentions of achieving a 10 percent ethanol blend mandate (E10) in the next few years, and Bolivia announced its goal to expand to a 25 percent blend (E25) by 2025. Japan, the European Union, and Brazil have also announced policies that would likely increase demand for fuel ethanol, and potentially U.S. ethanol, in these markets.

Changes to the current U.S. renewable fuel policy could increase demand for U.S. ethanol domestically. However, even if the U.S. renewable fuel policy does not change, U.S. fuel ethanol could still experience significant growth driven by renewable fuel policies adopted in other countries.

Sources: Lane, J., "Biofuels Mandates Around the World 2015," 12/31/14; Lane, J., "Biofuels Mandates Around the World 2018," 1/1/18; Lane, J., "LCFS vs RFS," 5/10/17; Voegele, E., "Pacific Ethanol … trade barriers," 8/13/18; Osborne, J., "Has ethanol hit its peak?," 8/16/18; Brooks, R. "EPA Told To Initiate Process … E15 Sales," 10/22/18.

[5] E15 is approved for use in passenger cars of model year 2001 and newer, as well as flexible fuel vehicles.

[6] U.S. ethanol currently faces a 70–80 percent tariff in China. The Chinese Government has recently started supporting the development of ethanol plants in that country.