

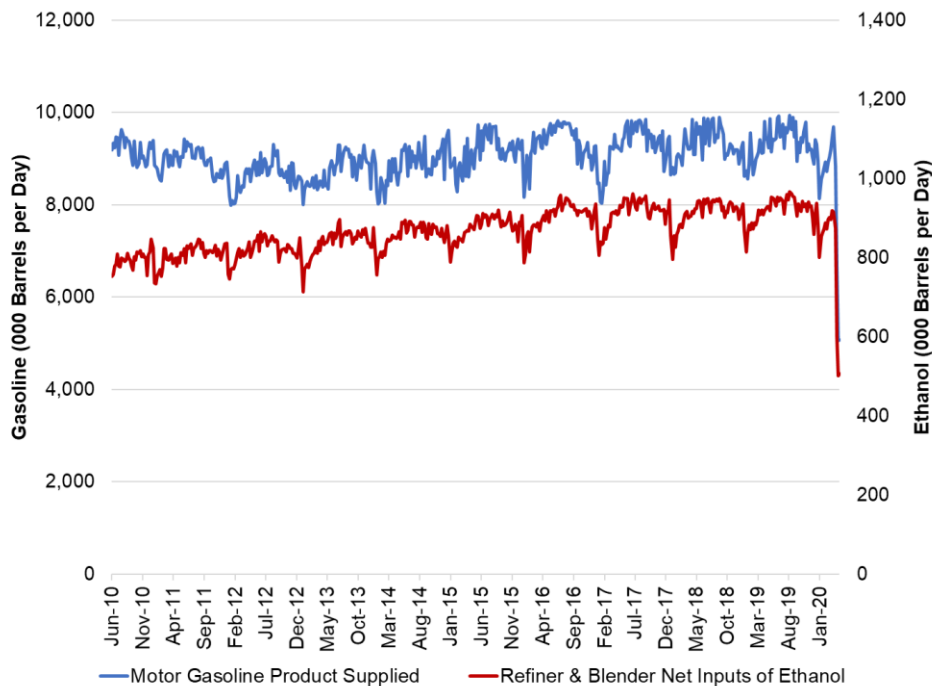
# THE ECONOMIC IMPACT OF COVID-19 ON THE ETHANOL INDUSTRY

*April 20, 2020*

## Background

The social-distancing and stay-at-home restrictions that have been imposed to limit the spread of COVID-19 have resulted in a dramatic reduction in motor gasoline consumption, which has fallen to multidecade lows over the course of only a few weeks. Consumption is now nearly 50% lower than at the same time last year (Figure 1). Since almost all of the gasoline sold in the United States is blended with ethanol, the reduction in gasoline consumption has led to a proportional drop in ethanol usage.

**Figure 1: Gasoline and Ethanol Consumption**



Source: EIA

Additionally, it is widely acknowledged that the country has entered a recession, and a number of economists are forecasting that GDP will contract by more than 20% during the current quarter. Over the last month, a staggering 22 million

Americans have filed for unemployment insurance, representing nearly 13% of the workforce.

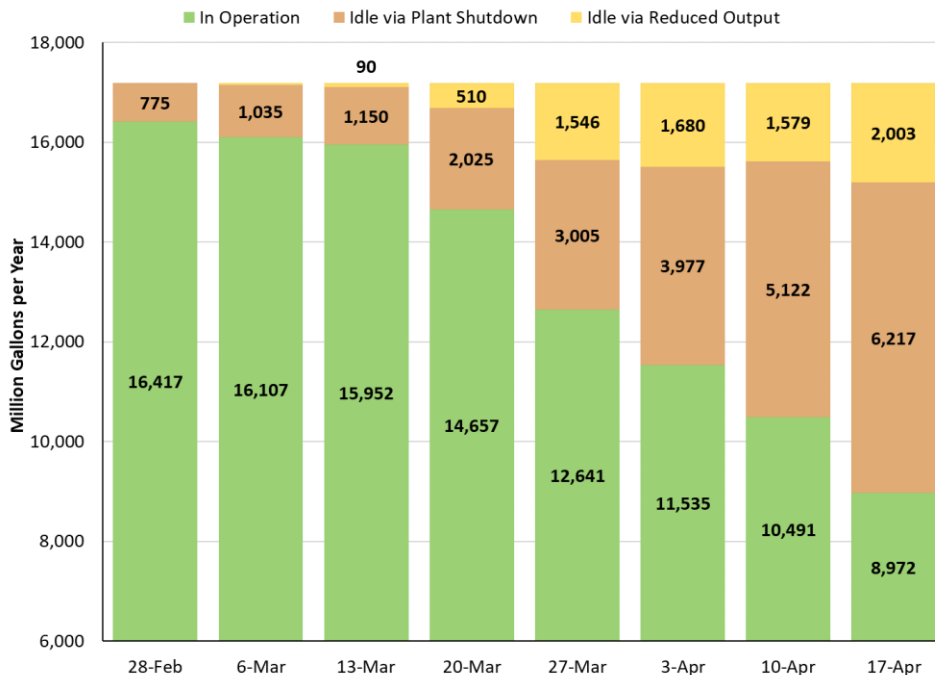
The federal government is providing unprecedented financial assistance to help citizens and businesses endure this period, and discussion has begun about how to “reopen” the economy. However, given the economic damage that is occurring and the likelihood that consumer behavior will not soon return to previous patterns, economic activity in general and transportation fuel usage in particular are expected to remain subdued through at least the end of the year.

**Impact on the Ethanol Industry**

The impact on the ethanol industry has been swift and sharp. Deeply negative operating margins and falling consumption have led to dramatic cuts in ethanol production. For the week ended April 10, ethanol production was 44% below the same time in 2019, hitting the lowest level since the EIA began reporting statistics in 2010.

As of this writing, approximately 70 ethanol facilities with an annual production capacity of 6.2 billion gallons have been fully idled, and nearly 70 more plants have reduced their operating rates by a combined 2.0 billion gallons annualized (Figure 2). At least 48% of the industry’s total production capacity is now offline, and only one-third of facilities are operating anywhere close to capacity. This cutback is unprecedented in its depth and speed.

**Figure 2: Ethanol Industry Capacity by Operational Status**



Source: RFA

For the reasons discussed above, and because the incidence of COVID-19 cases has not yet peaked, it is expected that deep reductions in gasoline and ethanol consumption will persist for several months, and usage will not approach year-earlier levels until possibly toward the end of 2020. Taheripour and Mintert (2020) aptly captured the current downturn in gasoline and ethanol demand and posited a reasonable recovery path in a recent paper.<sup>1</sup> They considered three scenarios of possible impacts of COVID-19 on gasoline and ethanol consumption. The medium-impact scenario is closest to the actual situation since it assumes a 50% reduction in April.

Regarding the trajectory over the remainder of 2020, they note, “In each scenario, for May, June, and July the impacts are assumed to diminish by 10% per month. . . . To take into account recession in economic activities beyond July, the reduction rates were linearly dropped to reach the reduction rates of about 5%, 7.5%, and 10% in December for the low, medium, and high impact scenarios.”

For our analysis, the percentage reductions assumed by Taheripour and Mintert in the medium-impact scenario were applied to an average of monthly ethanol consumption levels for April through December over the last few years. Additionally, a similar path was followed to arrive at a roughly equivalent 15% reduction in annual U.S. ethanol exports, since destination markets also have been affected by a combination of COVID-19, economic downturns and low gasoline prices. **In this scenario, ethanol production could be expected to fall by approximately 3 billion gallons in 2020 for supply and demand to balance—a severe cutback of nearly 20%.**

Moreover, COVID-19 is reducing not only ethanol volumes but also ethanol prices. Spot prices in Chicago, the central reference point for U.S. ethanol pricing, have fallen from \$1.40/gal at the end of 2019 to \$0.85/gal during early April. With ethanol inventories rising to record levels and the expectation that consumption will be slow to return, ethanol prices are likely to continue to be suppressed in the coming months.

To estimate the expected impact on ethanol prices, a regression was used in which the Chicago ethanol price is a function of the stocks-to-use ratio, the corn futures price, and a variable representing the relative price of gasoline. The regression was developed using monthly data since March 2010 and has an adjusted R-squared statistic of 0.91.

The cutback in ethanol production has already led to a significant drop in corn prices, since corn is the predominant feedstock for ethanol production. Just since early March, nearby corn futures prices have fallen by 17%. Additionally, the price

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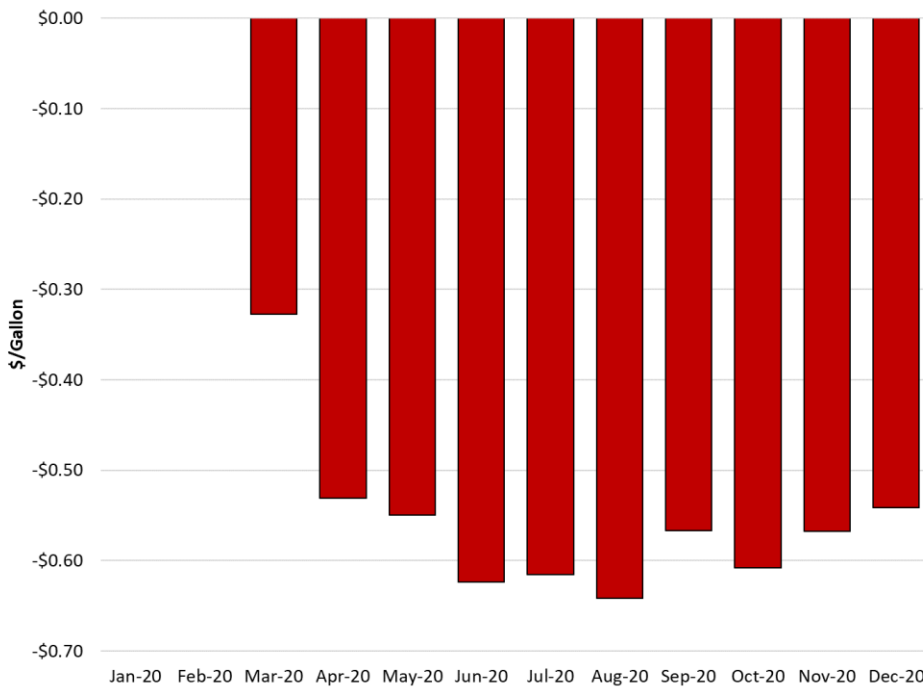
<sup>1</sup> Taheripour, F. and J. Mintert. “Impact of COVID-19 on the Biofuels Industry and Implications for Corn and Soybean Markets.” Center for Commercial Agriculture, Purdue University, April 13, 2020. Available at: <https://ag.purdue.edu/commercialag/home/resource/2020/04/impact-of-covid-19-on-the-biofuels-industry-and-implications-for-corn-and-soybeans-markets/>

of gasoline has been undercut not only by COVID-19 but also by the Saudi-Russian oil price war, which has had secondary effects on ethanol prices.

The regression was used to compare ethanol prices based on the likely trajectories of the explanatory variables for the remainder of 2020 to prices based on counterfactual trajectories reflecting conditions as they were expected to develop before COVID-19 cases grew and restrictions were imposed.

**It is estimated that the social restrictions and economic downturn associated with COVID-19 will result in a \$0.56/gal reduction in the price of ethanol on average over the period from March to December (Figure 3).** The reductions remain steep over the summer—which has traditionally been the peak driving season—mainly due to lingering high levels of ethanol inventories.

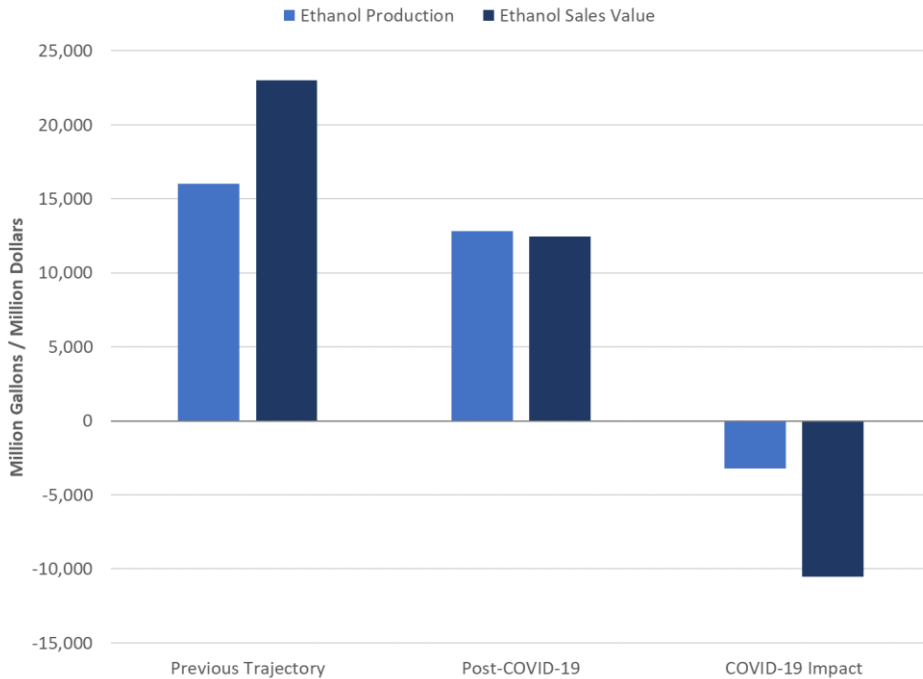
**Figure 3: Impact of COVID-19 on Ethanol Prices**



Source: RFA

As a result, ethanol industry revenues will be impacted by a pernicious combination of steep production cuts and sharply lower prices. **Whereas the industry would have been expected to generate \$23.0 billion in ethanol sales in 2020, now it is likely that the value of ethanol sold will only be \$12.5 billion, a 46% reduction (Figure 4).** Notably, this does not include potential lost revenues associated with lower sales of co-products like distillers grains, corn distillers oil, and captured carbon dioxide (although losses due to lower sales volumes may be partially offset by higher prices for these co-products).

**Figure 4: Impact of COVID-19 on Ethanol Production and Sales Value**



Source: RFA

### **Broader Economic Impacts**

The ethanol industry affects the broader U.S. economy through forward and backward linkages to other industries. A critical backward linkage is to agriculture. The ethanol industry has indirect effects on the economy through such business-to-business transactions. Additionally, the industry has so-called “induced economic effects” by providing incomes that are then spent on goods and services. Through these indirect and induced effects, direct activity in the ethanol industry is multiplied throughout the economy.

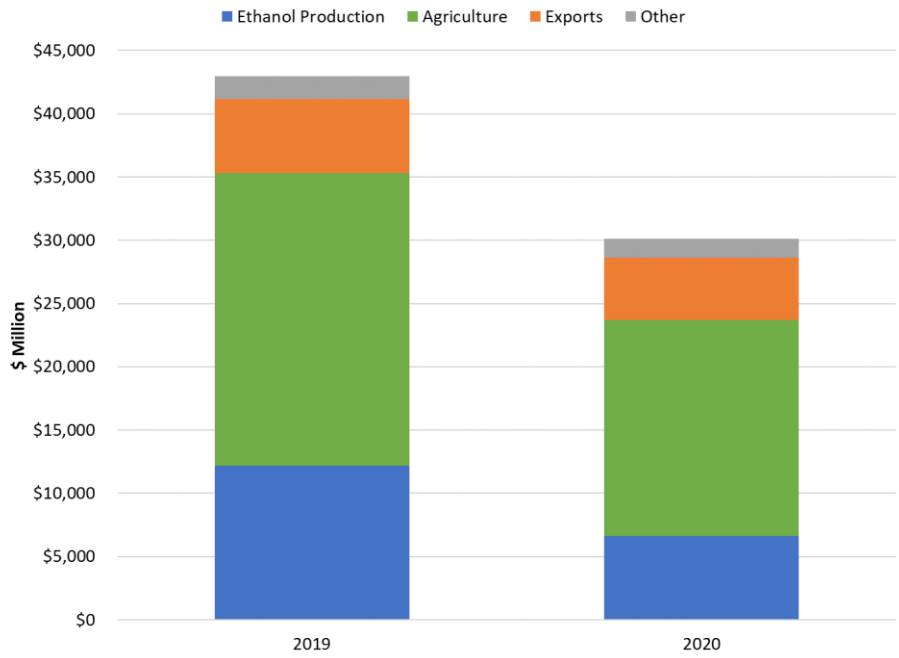
ABF Economics estimated that the ethanol industry contributed \$43.0 billion to U.S. GDP in 2019 and supported nearly 350,000 jobs.<sup>2</sup> Based on the RFA analysis described above, **it can be projected that the industry will contribute \$30.1 billion to GDP in 2020, nearly one-third less than in 2019** (Figure 5).

A top priority of the industry is to retain its skilled, experienced employees. Toward this end, ethanol companies have shown considerable interest in new government initiatives such as the Paycheck Protection Program. However, the extent of the downturn is so severe that layoffs appear likely. For this analysis, it was assumed that an average of 45 facilities will be fully idled for the remainder of 2020 (versus the 70 currently) and that each will lay off all but a small number of employees. It was assumed that plants that reduce their output rates will not lay off any

<sup>2</sup> ABF Economics. “Contribution of the Ethanol Industry to the Economy of the United States in 2019.” February 4, 2020. Available at: [www.ethanolrfa.org/reports/ethanol-and-the-economy/](http://www.ethanolrfa.org/reports/ethanol-and-the-economy/)

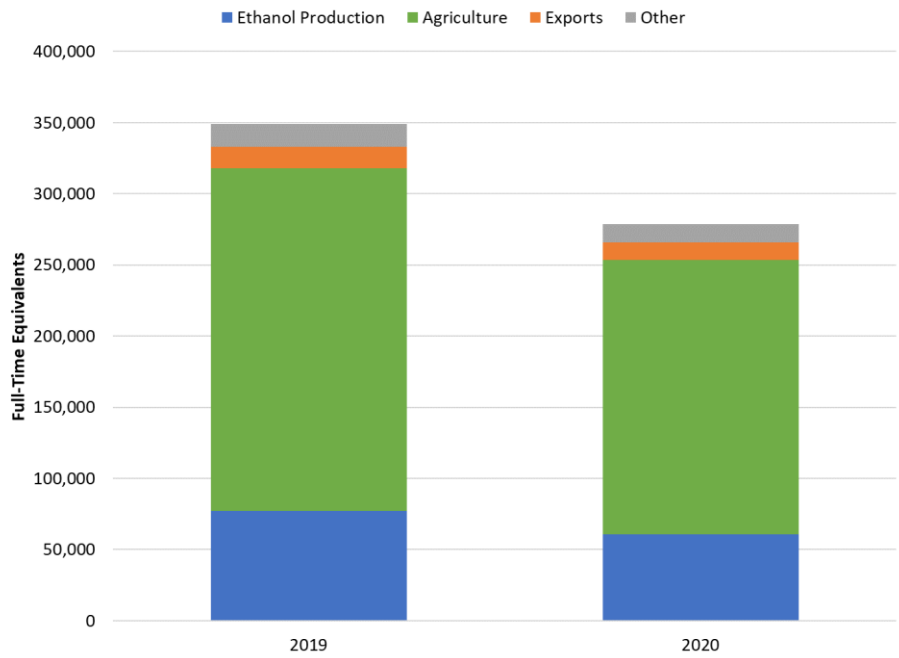
employees. Based on these assumptions and the economic impacts described above, **it is projected that the industry will support nearly 280,000 jobs in 2020, a 20% decrease from 2019** (Figure 6).

**Figure 5: Composition of Ethanol Industry Contribution to GDP**



Sources: ABF Economics (2019), RFA (2020)

**Figure 6: Composition of Employment Supported by the Ethanol Industry**



Note: Assumes fully idled plants lay off employees  
 Sources: ABF Economics (2019), RFA (2020)

## **Conclusion**

The restrictions and economic downturn associated with COVID-19 are having a dramatically negative impact on the ethanol industry, and this impact is expected to last through much of 2020. Weekly consumption has already fallen by nearly 50% compared to the same time in 2019. In response to declining usage, ethanol production could drop by 3 billion gallons for the year as a whole, a nearly 20% reduction. The combination of lower production and falling prices is expected to cause ethanol sales to plummet by \$10.5 billion, or 46%. These impacts will have ripple effects throughout the broader U.S. economy, notably in the agriculture sector.

In summary, while COVID-19 has affected a number of industries in the U.S., the ethanol industry has been particularly hard-hit, and the impacts are expected to continue.