

An Economic Analysis of the Impact of Bioethanol Production on Food Prices in the United States of America

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Introduction

Ethanol is considered an important renewable energy option to improve energy security and reduce environmental risks. However, Ethanol production directly depends on agricultural production and food security resources. That is why it is important to study the risks posed by the expansion of ethanol production and the opportunities it offers to reconcile energy and food issues in the world. The aim of the research is to analyze the correlation between energy markets and agricultural commodity markets and the impact of ethanol on deepening this relationship, and the direct and indirect impact of the growth of ethanol production on the prices of agricultural basic food commodities and their volatility.

Methods

The research was carried out in June 2018. To measure the relationship between ethanol production and food prices during period 1995-2017, Econometric models were used by adopting a time series framework on ethanol and agricultural prices “especially corn and wheat” as the primary source of ethanol production in the United States of America. Price index numbers were used to calculate the changes in the prices of food commodities to indicate the difference in prices between periods. The regression analysis determined the dependency and validity of the examined data.

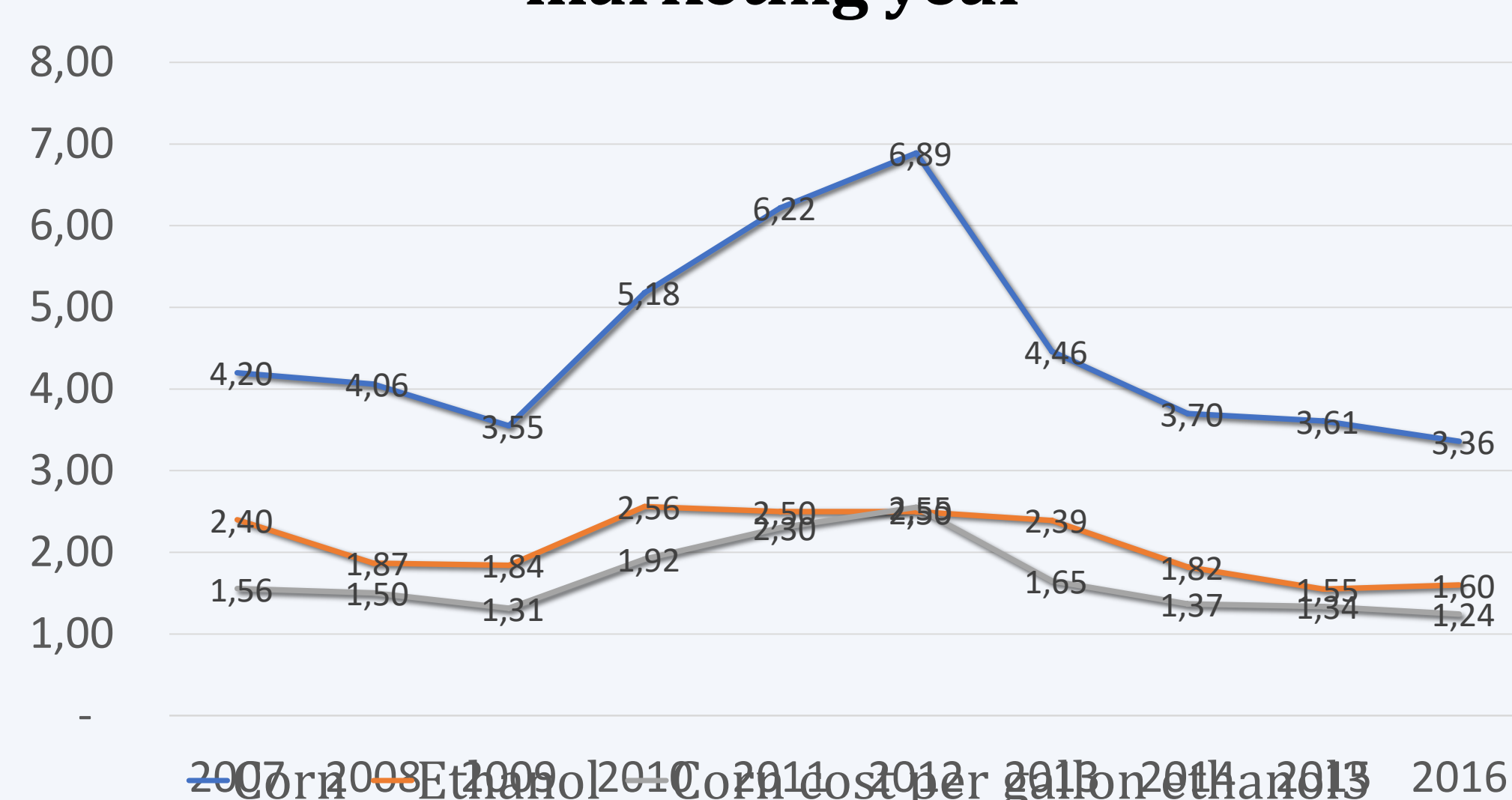
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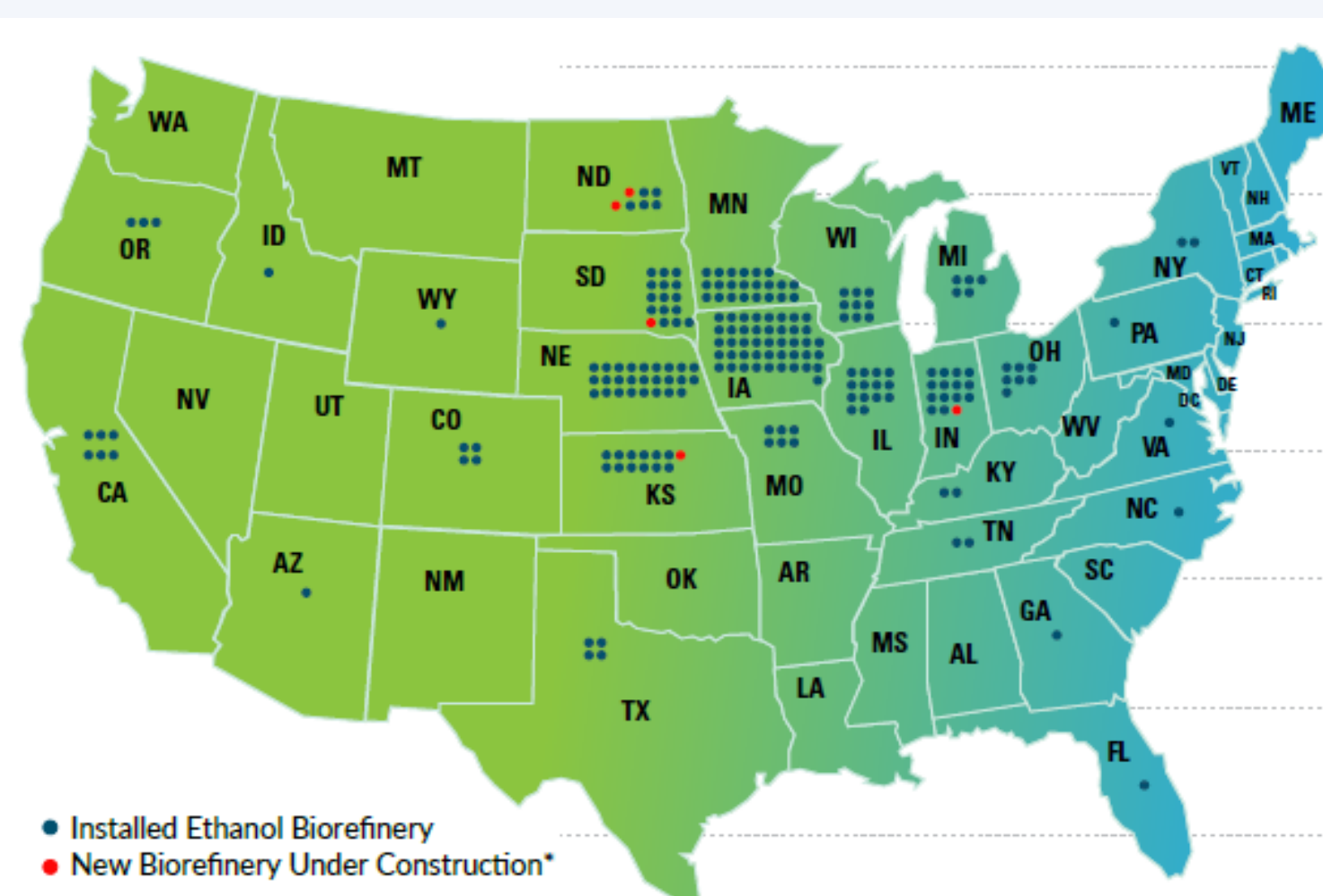
Results

- From the linear regression equation, a positive correlation can be observed between the price of the corn and the quantities used in the production of ethanol.
- The increase in the volume used from ethanol by one million ton lead to a rise in the price of corn by 1.135 dollars per ton.
- A Paasche price indices was used to calculate the corn price index based on the 1995. In 2017 prices increased by 75.51% for the base year 1995 and decreased by -3.90% for the previous year.
- If the price of corn increases one dollar per ton, then the price of wheat will increase 0.54 dollar per ton. This result is consistent with the economic substitution effect.

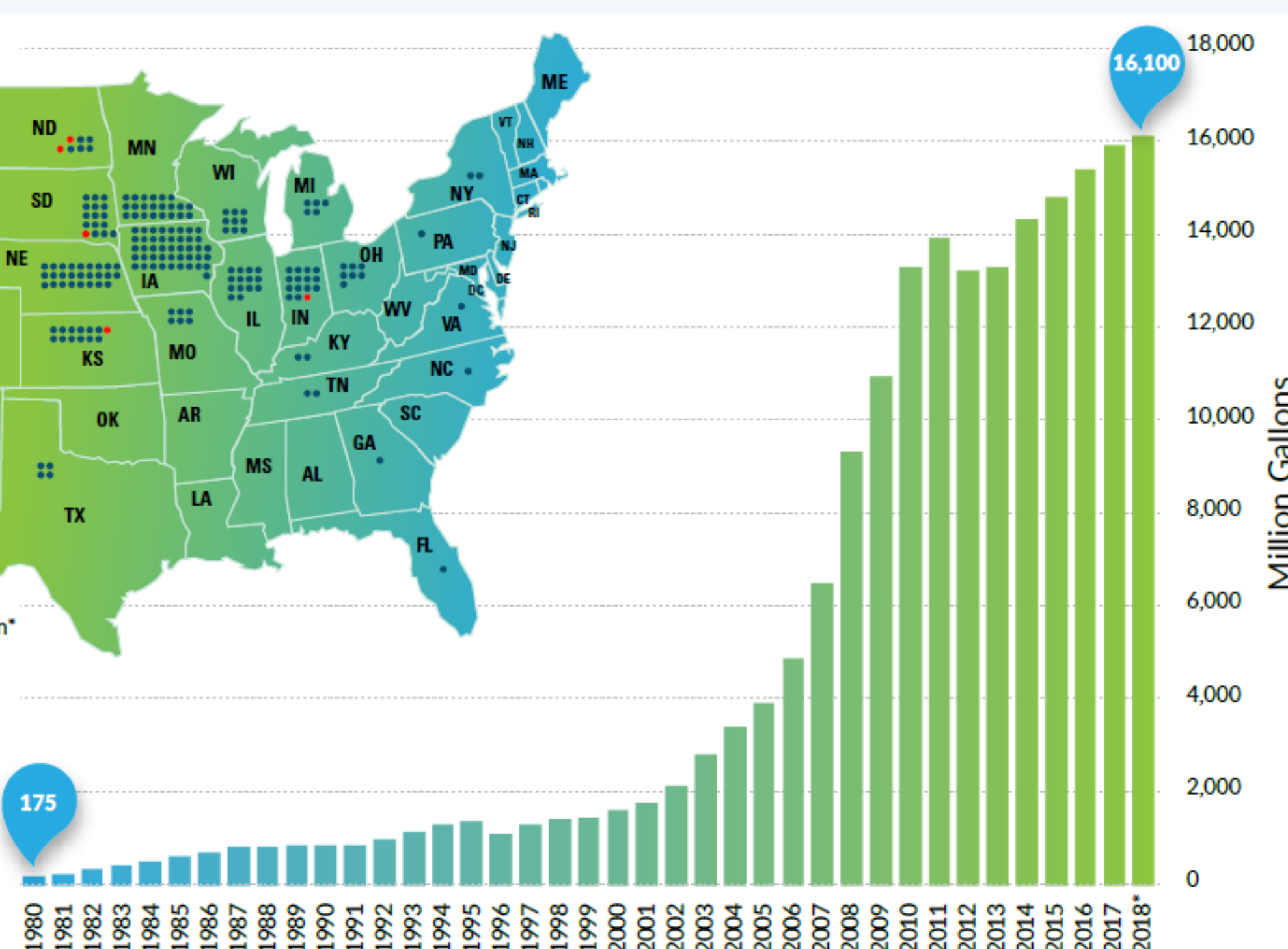
Fuel ethanol and corn prices, marketing year



U.S. Fuel Ethanol Biorefineries by State



Historic U.S. Fuel Ethanol Production

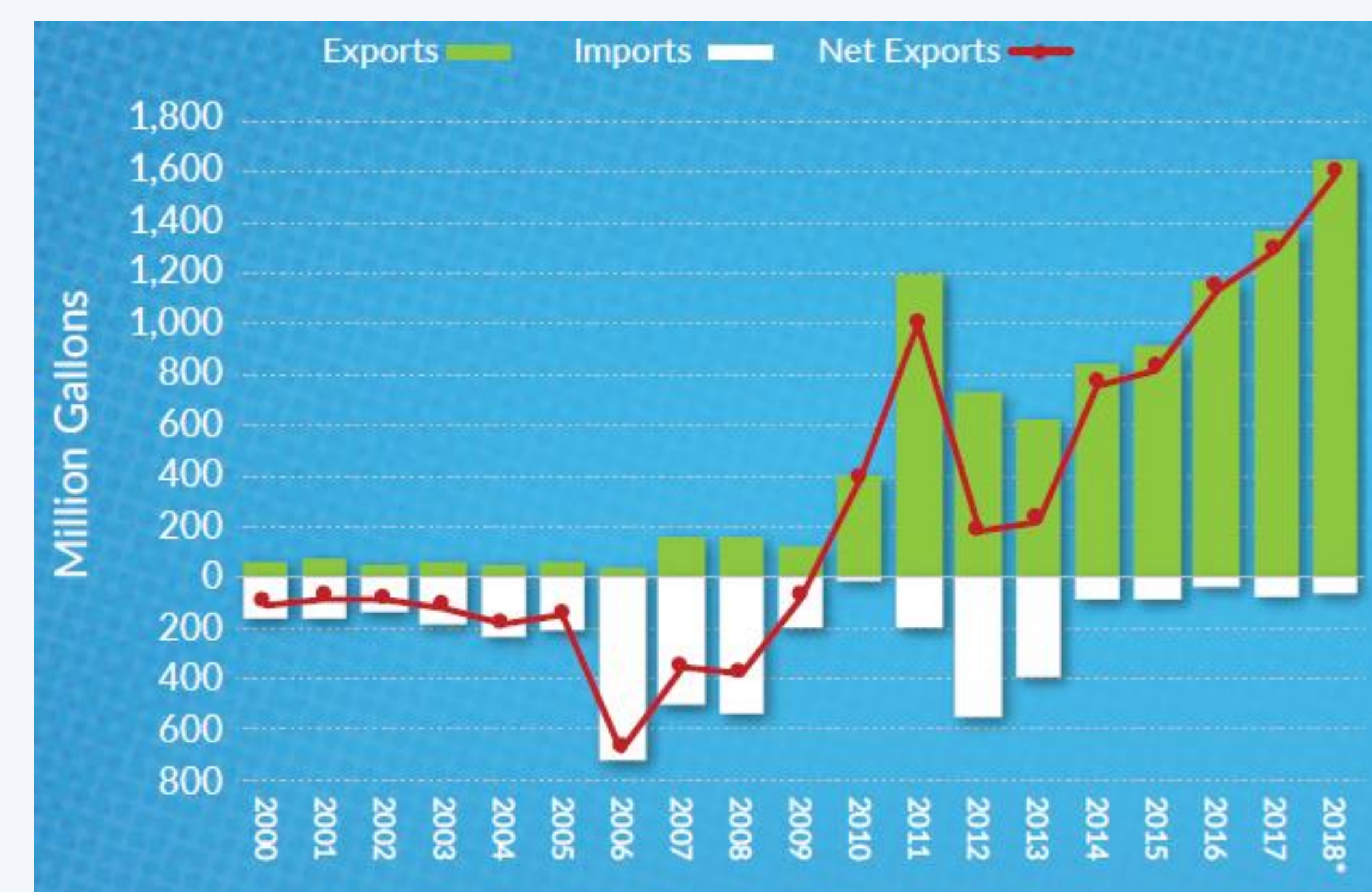


Discussion

Ethanol is reducing carbon emissions by at least 43 percent compared to gasoline. In addition to the environmental effect, ethanol has direct and indirect economic impact.

The production of 15.8 billion gallons of ethanol in the United States of America in 2017 gave jobs for 71.906 workers. Also, ethanol industry has helped supporting thousands of induced jobs in many sectors of the economy. The agricultural industry is ranked first in terms of the relative importance of the structure of inputs for the production of biofuels.

United States ethanol exports and imports



Sources: U.S. Dept. of Commerce, U.S. Census Bureau, Foreign Trade Statistics, RFA, 2018

Conclusion

Biomass energy has been highlighted as one of the most important renewable energy sources, which is increasingly used in total energy consumption in the world. The massive expansion of ethanol production in the United States of America would not have been possible without the government support. Biofuels are also a challenge to food security due to their direct impact on the availability of cereals and vegetable oils. The expansion of the use of corn in the production of ethanol will naturally lead to higher prices of the corn substitutes due to the increased demand.

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