# Article information:

Meeting sustainable aviation fuel policy targets through first generation corn biorefineries - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S0016236122031180>

# Article summary:

1. The paper investigates the potential for retrofitting existing corn biorefineries to produce low carbon and renewable aviation fuel through chemical process simulation.

2. The analysis shows that using corn feedstocks in dry grind biorefineries to convert sugars to 1,4-dimethylcyclooctane (DMCO) could reduce greenhouse gas emissions and displace fossil fuel in the aviation industry.

3. Repurposing existing corn dry grind biofuel capacity could immediately penetrate the fuel market in aviation and set the industry on a path to transition to lignocellulosic aviation fuel, ultimately offering a critical means of reaching climate stabilization.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "Meeting sustainable aviation fuel policy targets through first generation corn biorefineries" explores the potential for using existing commercial first-generation biorefineries to produce low-carbon and renewable aviation fuel. The authors evaluate the environmental impact of retrofitting a corn dry grind biorefinery to produce 1,4-dimethylcyclooctane (DMCO), which qualifies as renewable jet-A fuel blend and is infrastructure compatible. The analysis investigates the potential for reducing greenhouse gas (GHG) emissions and displacing fossil fuel (petroleum-based jet kerosene) in the aviation fuel industry.

The article provides valuable insights into the potential of using corn-to-DMCO as a low-carbon aviation fuel, which could be a strategic fuel product for retrofitting existing corn dry grind facilities. The authors suggest that corn dry grind facilities could displace about 12% of jet fuel demand in the near term, meeting sustainable aviation fuel policy targets. However, there are several biases and limitations in this study that need to be considered.

Firstly, the article focuses solely on the potential benefits of using corn-to-DMCO as a low-carbon aviation fuel without exploring any potential drawbacks or risks associated with this approach. For example, it does not consider the impact of diverting corn feedstocks from food production to biofuel production on food security or land use change GHG emissions. Additionally, it does not address concerns about monoculture farming practices associated with growing large quantities of corn.

Secondly, while the authors acknowledge that investment in carbon capture and storage (CCS) at the biorefinery and adoption of crop best management practices on farms are essential for mitigating risks associated with induced land use change GHG emissions for existing corn biorefineries, they do not provide any evidence or data to support these claims.

Thirdly, the article presents an overly optimistic view of using first-generation biorefineries to produce low-carbon aviation fuels without acknowledging their limitations. First-generation biofuels have been criticized for their negative environmental impacts, including deforestation, soil degradation, water pollution, and biodiversity loss. Moreover, they compete with food production for land and resources.

Finally, while the article acknowledges that biomass conversion to aviation fuel could meet energy policy goals for decarbonizing the aviation sector in the long term, it fails to explore alternative approaches such as electrification or hydrogen-based fuels that may offer more sustainable solutions.

In conclusion, while "Meeting sustainable aviation fuel policy targets through first generation corn biorefineries" provides valuable insights into using existing commercial first-generation biorefineries to produce low-carbon and renewable aviation fuels through chemical process simulation based on DMCO production from corn feedstocks; it has several biases and limitations that need to be considered when evaluating its findings.

# Topics for further research:

* Impact of corn-to-biofuel production on food security and land use change GHG emissions
* Risks associated with induced land use change GHG emissions for existing corn biorefineries
* Evidence and data supporting the adoption of crop best management practices on farms for mitigating risks associated with induced land use change GHG emissions
* Negative environmental impacts of first-generation biofuels
* including deforestation
* soil degradation
* water pollution
* and biodiversity loss
* Competition between first-generation biofuels and food production for land and resources
* Alternative approaches to decarbonizing the aviation sector
* such as electrification or hydrogen-based fuels.

# Report location:

<https://www.fullpicture.app/item/ae7369191b34e494e864afe9e6b9aeac>