



## Biorenewable Insights: Ethanol to Jet

Ethanol to Jet is one in a series of reports published as part of NexantECA's 2024 Biorenewable Insights program.

### Overview

Recent market disruption caused by volatile oil prices, concerns over lack of security for crude oil supply, speculation around crude oil production reaching its peak and increased consumer awareness about global warming, have collectively propelled the aviation industry, as well as national interests, to actively seek a stable, secure, and sustainable source of aviation fuel. In response to both individual airlines and various governments committing to reducing their carbon footprint, there is a heightened urgency to adopt Sustainable Aviation Fuel (SAF) as a viable and eco-friendly alternative.

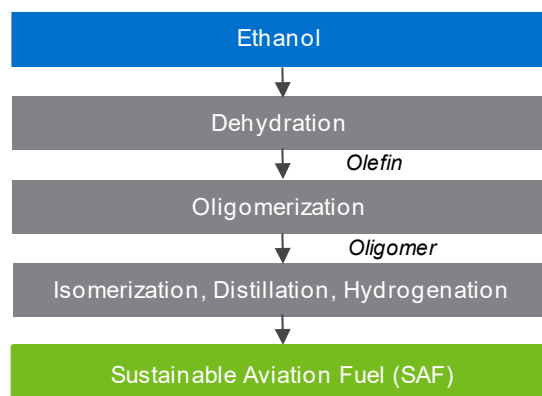
Ethanol to Jet (ETJ) is a process of ethanol conversion to an alternative jet fuel blendstock based on catalytic steps utilized by the petrochemical industry. The Alcohol to Jet (ATJ) process has been certified by ASTM since 2016 for blends of up to 50 percent. Efforts are underway for the certification of 100 percent of jet fuel derived from ATJ. This BI report provides an overview of the various technology players. The following aspects are also addressed in this report:

- Technology overview
- Commercial applications of ETJ
- Comparison of the pathways by different technology providers and process economics
- Carbon intensity impact
- Capacity analysis

### Technologies

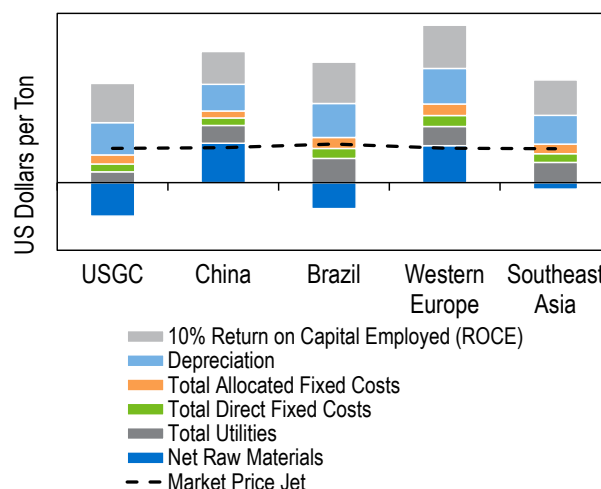
The generic ETJ process consists of dehydration of ethanol, followed by the catalytic conversion of the resulting olefins through oligomerization and subsequent steps such as hydrogenation, isomerization, and distillation to jet fuel.

Each step involved in ETJ is currently used at a commercial scale in the petrochemical industry and therefore are technologically and economically mature. Thus, the cost-effective production of ethanol from feedstocks such as corn or sugarcane is the only main barrier to the adoption of the ETJ technology.



### Process Economics

Detailed cost of production estimates for ETJ technology by various technology players are presented. Regional comparison includes USGC, Brazil, Western Europe, China and Southeast Asia.



### Commercial Impact

Successful deployment and penetration of ETJ into conventional jet fuel market is dependent on several factors:

- Sustainable supply of ETJ to meet growing demand of SAF
- Regulatory and policy drivers
- Closing the price gap between conventional jet fuels and ethanol-based jet

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## Biorenewable Insights: Ethanol to Jet

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