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Catalytic Hydrothermolysis Jet Fuel Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Feedstock Type (Used Cooking Oil, Animal Fats, Tallow, Algae, Others), By Technology (Pure Catalytic Hydrothermolysis Process, CH Integrated with HEFA, CH + Fischer-Tropsch Synthesis), By Application (Commercial Aviation, Military Aviation, Cargo Aviation, Private & Business Aviation), By Region & Competition, 2020-2030F

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Abstracts

Market Overview

The Global Catalytic Hydrothermolysis Jet Fuel Market was valued at USD 2.81 Billion in 2024 and is projected to reach USD 6.40 Billion by 2030, growing at a CAGR of 14.53% during the forecast period. As aviation seeks viable pathways to reduce carbon emissions, Catalytic Hydrothermolysis Jet Fuel (CHJ) is emerging as a vital component of the sustainable aviation fuel (SAF) segment. This advanced thermochemical technology replicates the natural crude oil formation process by converting renewable lipids—such as used cooking oil, animal fats, and other non-edible oils—into hydrocarbon-based bio-crude, which is further refined into drop-in jet fuel meeting ASTM D7566 standards. CHJ's appeal lies in its feedstock flexibility, significant carbon emission reduction potential (up to 80%), and compatibility with existing aircraft engines. Supported by global climate mandates like ReFuelEU and the U.S. SAF Grand Challenge, the market is witnessing accelerated development. Key industry players and

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refiners are investing in large-scale production facilities and forming partnerships to scale this promising low-carbon jet fuel technology.

Key Market Drivers

Rising Aviation Sector Emissions and Decarbonization Commitments

The CHJ market is being driven by growing urgency to cut carbon emissions in aviation—a sector accounting for approximately 2.5% of global CO? emissions. Without intervention, aviation emissions could triple by 2050. The International Air Transport Association (IATA) and over 130 countries under the ICAO Long-Term Aspirational Goal have pledged to achieve net-zero emissions by 2050, prompting adoption of SAFs like CHJ. CHJ fuels can reduce lifecycle CO? emissions by up to 80% and function as drop-in replacements for conventional Jet-A, eliminating the need for aircraft or infrastructure modifications. Policy mandates such as the EU's ReFuelEU, requiring 2% SAF by 2025 and 70% by 2050, are intensifying demand. Additionally, major airlines have secured long-term offtake agreements for over 15 billion liters of SAF. These factors collectively position CHJ as a scalable and policy-aligned solution in global aviation decarbonization strategies.

Key Market Challenges

High Capital and Operational Costs

One of the primary challenges for the CHJ market lies in the high capital and operating costs associated with building and running production facilities. The process demands advanced high-temperature, high-pressure equipment, corrosion-resistant materials, and substantial energy inputs. Construction of a single CHJ facility may require investments in the hundreds of millions of dollars, limiting entry to well-capitalized firms or those with government backing. Operational costs are further elevated by feedstock preprocessing and hydrogen usage during upgrading. Currently, CHJ production costs remain 2–4 times higher than fossil-based jet fuels, making competitiveness an issue in price-sensitive markets. Moreover, the reliance on region-specific subsidies introduces financial risk. Geographical constraints linked to feedstock and hydrogen sourcing also limit deployment flexibility. These factors pose significant hurdles to commercial scalability, especially in emerging markets. Addressing these cost barriers through technological improvements and stable offtake contracts is critical to unlocking broader market potential.

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Key Market Trends

Strategic Collaborations Between Technology Providers and Refiners

A key trend shaping the CHJ market is the increasing collaboration between technology developers, refiners, and engineering firms aimed at accelerating commercialization. CHJ technology, though proven, requires substantial investment and integration expertise. Strategic partnerships help bridge technical gaps, reduce risk, and streamline project execution. For example, Applied Research Associates (ARA), originator of the CH process, has licensed its CH Jet® technology through a collaboration with Chevron Lummus Global (CLG), enabling turn-key implementation solutions. Similarly, Aemetis is developing a 90 million gallon-per-year CHJ facility in California, supported by engineering partnerships and offtake agreements. These alliances also aid in securing feedstock supplies, qualifying for carbon credits, and retrofitting existing refineries to lower capital requirements. Through shared investment and operational synergies, such partnerships are pivotal to scaling CHJ production and expanding its market footprint.

Key Market Players

Aemetis, Inc.

Applied Research Associates, Inc.

Neste Oyj

Chevron Lummus Global

World Energy

Gevo, Inc.

Honeywell UOP

LanzaJet

SkyNRG

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Fulcrum BioEnergy

Report Scope:

In this report, the Global Catalytic Hydrothermolysis Jet Fuel Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Catalytic Hydrothermolysis Jet Fuel Market, By Feedstock Type:

Used Cooking Oil

Animal Fats

Tallow

Algae

Others

Catalytic Hydrothermolysis Jet Fuel Market, By Technology:

Pure Catalytic Hydrothermolysis Process

CH Integrated with HEFA

CH + Fischer-Tropsch Synthesis

Catalytic Hydrothermolysis Jet Fuel Market, By Application:

Commercial Aviation

Military Aviation

Cargo Aviation

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Private & Business Aviation

Catalytic Hydrothermolysis Jet Fuel Market, By Region:

North America

United States

Canada

Mexico

Europe

Germany

France

United Kingdom

Italy

Spain

South America

Brazil

Argentina

Colombia

Asia-Pacific

China

India

Japan

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South Korea

Australia

Middle East & Africa

Saudi Arabia

UAE

South Africa

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Catalytic Hydrothermolysis Jet Fuel Market.

Available Customizations:

Global Catalytic Hydrothermolysis Jet Fuel Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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