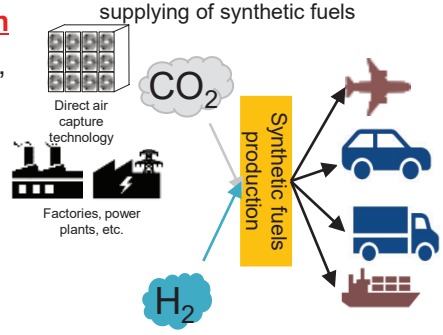
Development of Technology for Producing Fuel Using CO_2, etc. (Amount covered by the government: Up to 115.28 billion yen)

- Decarbonized fuel **has the potential to transform the energy supply and demand structure in Japan**—which is dependent on fossil fuels from other countries—making it important from the perspective of energy security. Using existing infrastructure will greatly **help reduce initial costs**. The goal is to solve issues related to production technology and **lower production costs** to **implement them throughout society**.
- It is necessary to promote the development of technology for decarbonized fuel as **one of the various options for realizing a decarbonized society**. This project will work toward the social implementation of two liquid fuels—**(1) synthetic fuels** and **(2) sustainable aviation fuels (SAF)**—and two gaseous fuels—**(3) synthetic methane** and **(4) green LPG**.

Development of technology for improving production yield and utilization technology of synthetic fuels

- Develop a process to **convert** CO_2 and hydrogen **to liquid fuel at high efficiency on a large scale** using **reverse water-gas shift**, **Fischer-Tropsch synthesis**, **technologies that combine** them.
- Achieve a **liquid fuel yield rate of 80%** on a pilot scale (planned 300 bbl./day) by 2030 with the goal of **making the process independently commercialized by 2040**.

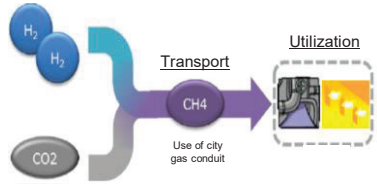
Image of production and supplying of synthetic fuels



Development of innovative technology for the production of synthetic methane

- Establish technology for **methanation, a process that efficiently synthesizes methane using hydrogen produced** from renewable energy sources etc., and **CO_2** captured at power plants etc..
- Achieve **an energy conversion efficiency rate of 60% or higher by 2030**.

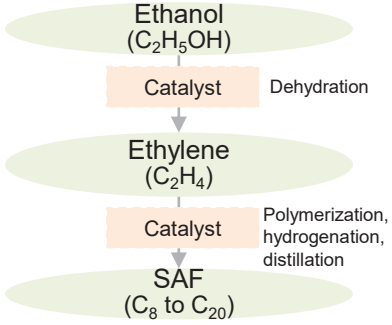
Image of methanation



Development of technology for producing sustainable aviation fuels (SAF)

- Establish **ATJ (Alcohol to JET) technology to produce SAF from ethanol** which will allow large production volumes (hundreds of thousands of kiloliters).
- Achieve **a liquid fuel yield rate of 50% or higher and a production cost of 100 yen/L level** with the aim of having the fuel used by **aircraft by 2030**.

Image of the SAF production process



Development of technology for synthesizing green LP gas without fossil fuels

- Establish technology for synthesizing **LP gas (green LPG), which is not made from fossil fuels**, but synthesized from hydrogen and carbon monoxide using methanol and dimethyl ether.
- Aim to establish synthesis technology with **a production rate of 50%** and have it **commercialized by 2030**.

Image of the green LPG production process