October 25, 2023

ENEOS Corporation
Toshiba Energy Systems & Solutions Corporation

ENEOS and Toshiba Join Forces in Feasibility Study of Synthetic Fuel Production System Integrating CO2 Electrolysis Technology

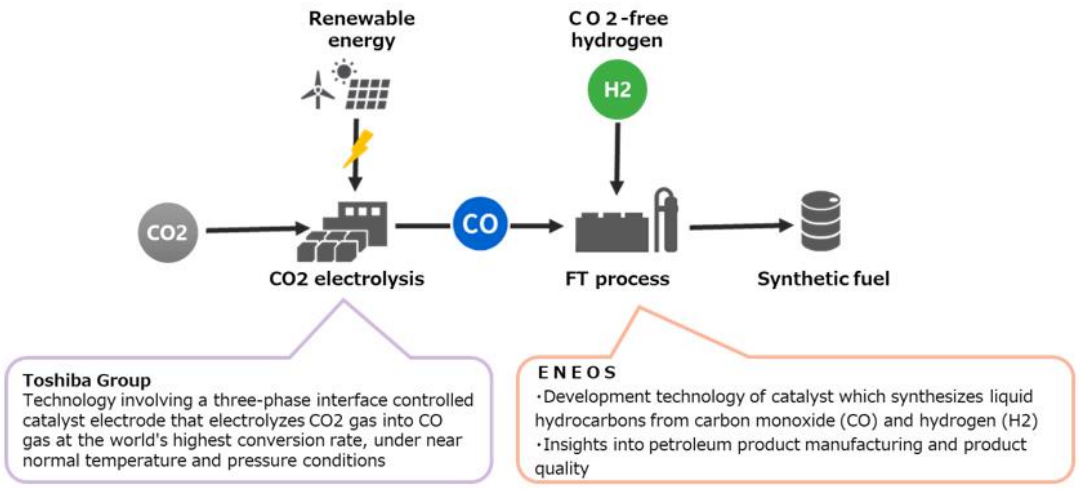
ENEOS Corporation (President and CEO: Takeshi Saito, "ENEOS") and Toshiba Energy Systems & Solutions Corporation (President and CEO: Tadasu Yotsuyanagi, ”Toshiba”) have concluded a basic agreement on a joint feasibility study of a synthetic fuel production system integrating CO2 electrolysis technology.

Efforts are underway in Japan’s consumer and industrial sectors to achieve carbon neutrality by 2050, under the “Carbon Recycling Roadmap” formulated by the Ministry of Economy, Trade and Industry (METI). Under this strategic agreement, ENEOS and Toshiba aim to evaluate the manufacture of synthetic fuels, a highly promising application of carbon recycling technology that converts exhaust gases and atmospheric carbon dioxide into useful substances.

Synthetic fuel is a liquid fuel made from hydrogen derived from renewable energy sources （CO2-free hydrogen） and CO2. It has unique composition and the potential to reduce CO2 emissions throughout its entire lifecycle, from raw material production to end-user consumption, making it a pivotal contributor to achieving a carbon neutral society.

Toshiba Group has cutting-edge CO2 electrolysis technology that converts CO2 into highly chemically active carbon monoxide (CO) *[1] at the world's highest CO2 conversion rate*[2], and ENEOS has expertise in FT catalysis technology*[3] and insights into petroleum product manufacturing and product quality. Their collaboration will explore a production process that integrates these technologies, and assess its properties and commercial viability.

【Synthetic fuel production process using CO2 electrolysis and FT synthesis】



An integral part of the ENEOS Group's Long-Term Vision to 2040 is to take on the challenge of achieving “a stable supply of energy and materials” and “the realization of a carbon-neutral society”. Through proactive involvement in synthetic fuel production, ENEOS will lead Japan’s energy transition and continue to work towards achieving carbon neutrality by 2050.

Toshiba Group’s "Environmental Future Vision 2050" sets the goal of contributing to the realization of a sustainable society through environmental management that creates enriched value and ensures harmony with the earth. One goal is carbon neutrality throughout the entire value chain, with a 70% cut in greenhouse gas emissions by FY2030.

ENEOS and Toshiba are committed to a comprehensive assessment of the commercial viability of a system that is expected to significantly reduce CO2 emissions, and to make a substantial contribution to carbon neutrality. Both companies will continue to actively pursue efforts towards realizing a decarbonized and circular society.

Evaluation Period:
October 2023 – End of March 2024 (Projected)

*1 Technology involving a three-phase interface controlled catalyst electrode that electrolyzes CO2 gas into CO gas at the world's highest conversion rate, under near normal temperature and pressure conditions.

News Releases:
- Toshiba Leads the World in Converting CO2 into Useful Materials for Chemical Products
- Toshiba’s Carbon Recycling Technology Realizes World’s Highest CO2 Conversion Speed and Achieves Decarbonization in a Limited Space

*2 Technology able to operate at room temperature in a CO_2 electrolysis stack, with an installation area about the same size as a C5 envelope, and that achieves an annual processing capacity of up to 1.0 ton of CO_2.

News Release:
- Toshiba’s Carbon Recycling Technology Realizes World’s Highest CO2 Conversion Speed and Achieves Decarbonization in a Limited Space

*3 This technology advances the development of catalysts that drive the Fischer-Tropsch (FT) reaction, which synthesizes liquid hydrocarbons from carbon monoxide (CO) and hydrogen (H2).