KYUSHU UNIVERSITY

MOONSHOT RESEARCH & DEVELOPMENT PROGRAM

MOZES Moonshot for beyond Zero-Emission Society

Development of Global CO_2 Recycling Technology towards "Beyond-Zero" Emission

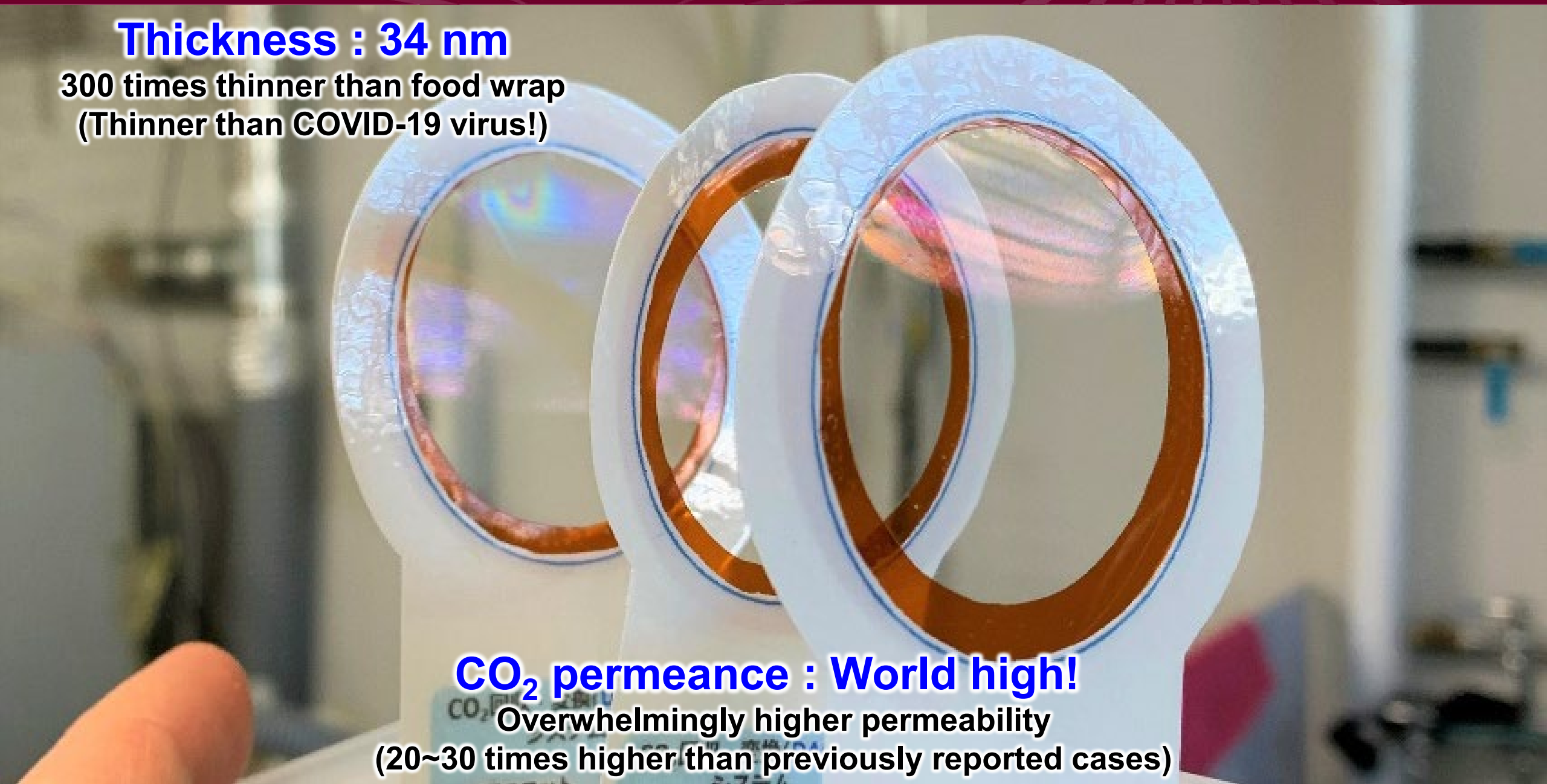
Project Manager
Shigenori FUJIKAWA

Kyushu University, Japan

Hokkaido University
Kumamoto University
Kagoshima University
University of Tokyo
Osaka Institute of Technologies
Nanomembrane Technologies, Inc.
University of Illinois at Urbana Champaign

ILLINOIS

Ultrafast CO_2 separation nanomembrane



Thickness : 34 nm

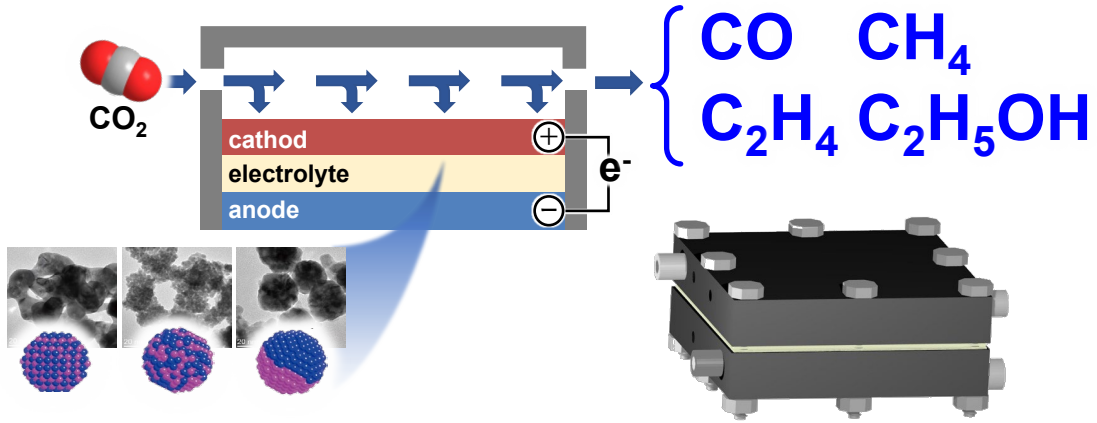
300 times thinner than food wrap
(Thinner than COVID-19 virus!)

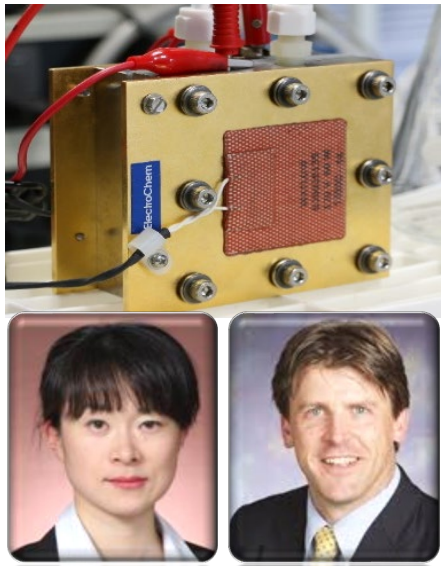
CO_2 permeance : World high!

Overwhelmingly higher permeability
(20~30 times higher than previously reported cases)

CO_2 conversion after membrane-based DAC

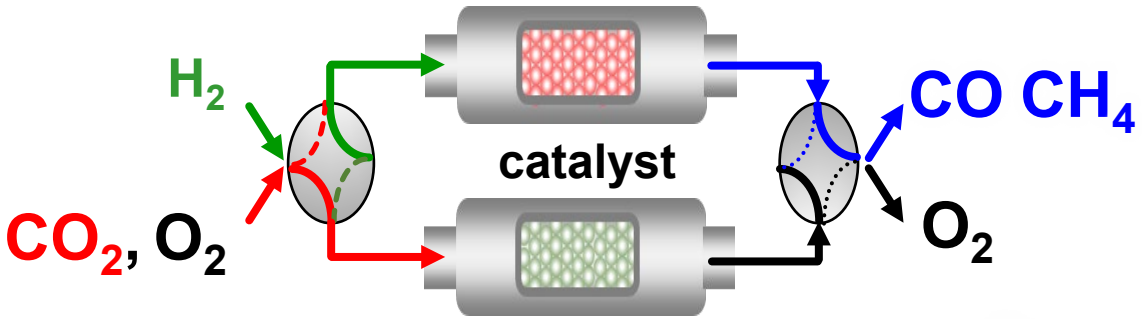
1. Electrochemical conversion





Prof. M. Yamauchi (Kyushu Univ., Japan)
Prof. P. Kenis (UIUC, US)

2. Thermochemical conversion



Prof. K. Shimizu (Hokkaido Univ., Japan)

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Direct Air Capture and Utilization system

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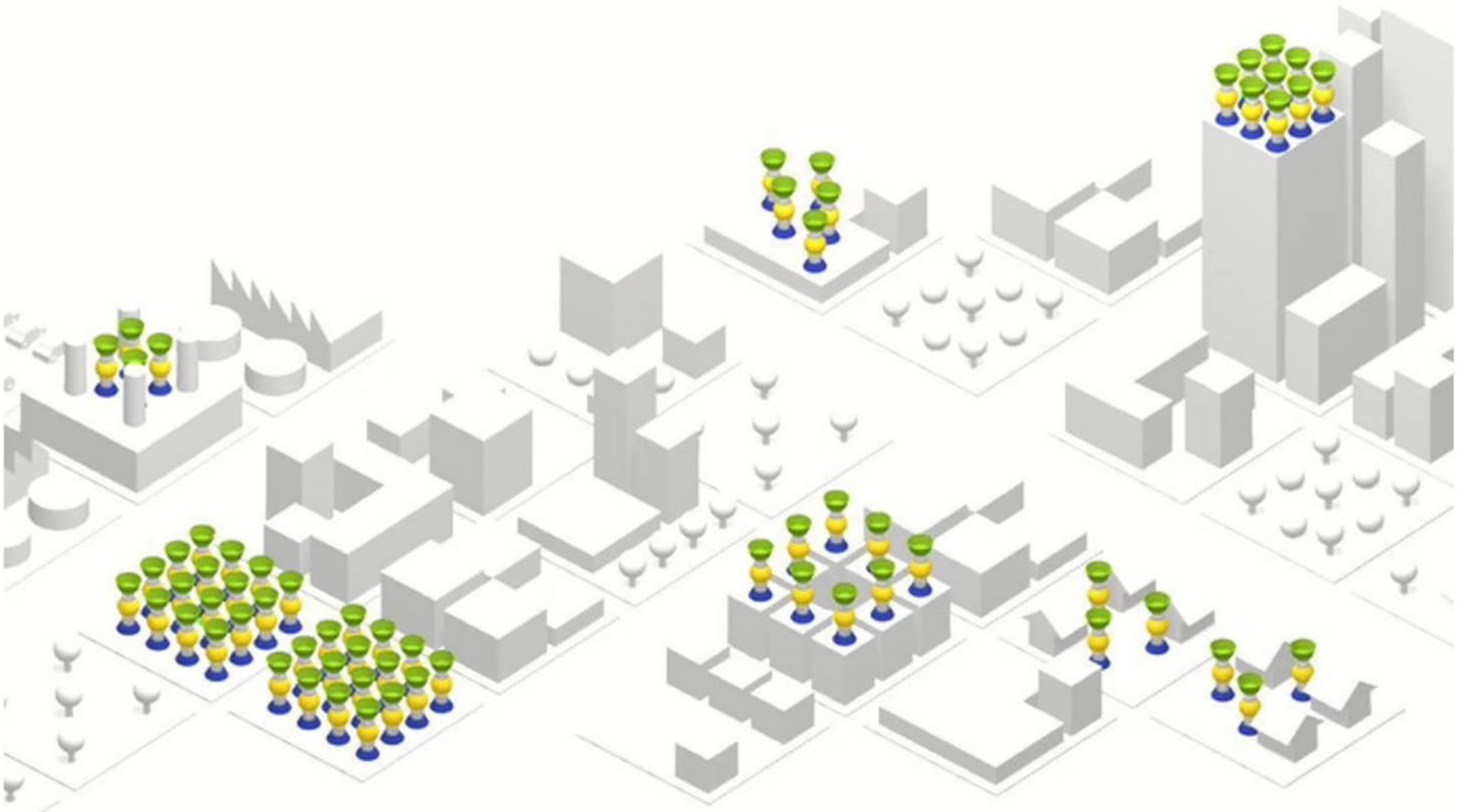
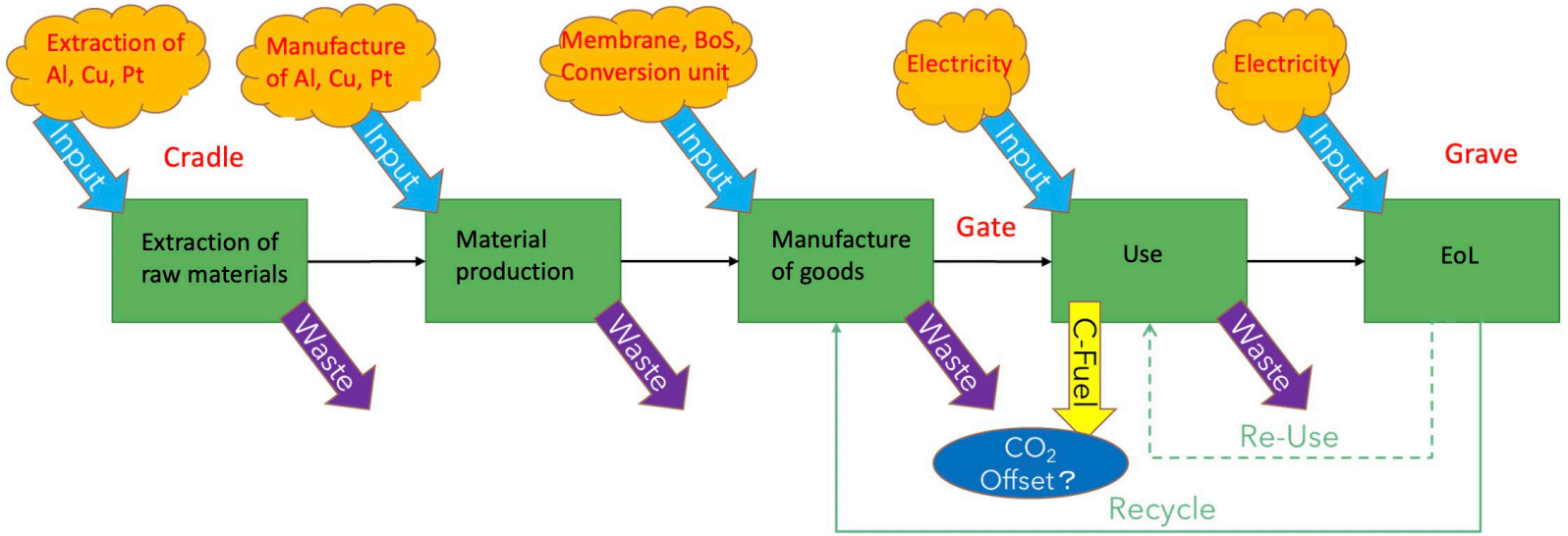
Decentralized DAC-U system



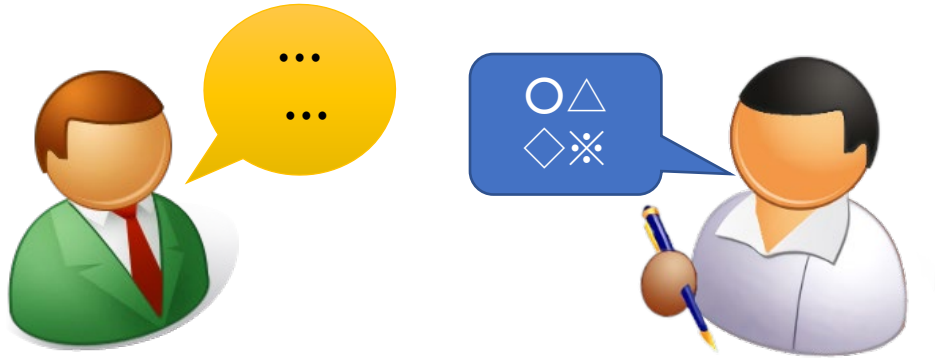
Boundary of LCA

- ✓ **Life Cycle Analysis (LCA) is performed with Cradle to Grave scope.**
- ✓ **Comparison among different conversion approaches (thermal conversion and electrical conversion) are conducted. Hotspots are identified and feedback is provided to development Unit leaders to reflect the results to technology development**



Future issues and measures for R&D and LCA

- ✓The construction of LCA inventory data is an important part of not only the GWP evaluation but also the basis for socioeconomic impact assessment, and must be done Iteratively in accordance with development process.



- ✓We are building a model that takes EoL into account; we need more reference data to consider EoL. We'd like to learn how other DAC technologies consider EoL.


“Ubiquitous Carbon capture”
Carbon Capture Anywhere!