Three partners build a demonstration system for *CO_2NNEX for e-methane*, a digital platform for visualizing CO_2 emissions across e-methane value chain and transferring e-methane's environmental value

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IBM Japan, Ltd.

Osaka Gas Co., Ltd., Mitsubishi Heavy Industries, Ltd. (MHI), and IBM Japan, Ltd. today jointly announced that they have built a demonstration system (the "System," see Figure 1) for *CO_2NNEX for e-methane*, a digital platform for visualizing the amount of CO_2 emissions across the value chain of e-methane (methane synthesized with the methanation technology) and transferring e-methane's environmental value. *CO_2NNEX for e-methane* is based on CO_2NNEX, a digital platform being developed by MHI and IBM Japan for visualizing the CO_2 supply chain. In conducting the PoC (Proof of Concept) of *CO_2NNEX for e-methane*, the three partners will discuss and exchange views with the Japan Gas Association, Tokyo Gas Co., Ltd., Toho Gas Co., Ltd., and INPEX CORPORATION to identify effective ways to promote the use of e-methane and establish its environmental value.

Using the System, this tripartite project aims to achieve the following: A system for managing the amount of CO_2 emissions from its sources throughout the e-methane supply chain to provide the data of e-methane's quantified environmental value to gas users; A shared platform that digitally connects e-methane production sites to markets for trading and transferring the environmental value of e-methane, which will be blended with natural gas in the pipeline. The three partners pursue this initiative, aiming to contribute to the transition to a net zero society, which requires practical solutions as currently studied, such as CO_2 accounting methods for CCU (carbon dioxide capture and utilization), including methanation, and the application of the accounting methods for e-methane, a recycled-carbon fuel.

The System has been established as part of the partners' joint project for another PoC that has been underway since October 2022 utilizing CO_2NNEX. For the System, the partners have developed a feature that visualizes the amount of CO_2 emissions throughout the e-methane lifecycle, from production to transport, supply, and combustion (see Figure 2) and a feature that displays the balance of e-methane environmental value held by each participant and requests/authorizes the trading of the value (see Figure 3).

The project plans to conduct the demonstration to examine the effectiveness and efficiency of utilizing *CO_2NNEX for e-methane* while promoting a wider recognition of the System to collect feedback from academia, industry, and government. The partners intend to apply the PoC results to planned methanation demonstrations, aiming to realize the practical application of e-methane and contribute to achieving a carbon neutral society.

About *CO_2NNEX for e-methane*
CO_2NNEX for e-methane quantifies e-methane's environmental value by tracking and managing CO_2 emissions throughout the e-methane supply chain from production to supply, including transport, and combustion by each participant at each location. The project aims to build a shared platform that transfers and trades e-methane's environmental value.

About methanation
Methanation is a technology for synthesizing methane, the main component of natural gas, from hydrogen and CO_2. The resulting product is known as e-methane. The use (combustion) of e-methane results in no effective increase in CO_2 for society as a whole because CO_2, which is normally emitted into the atmosphere,

is captured and recycled for use in producing e-methane. Also, methanation is expected to be an economically efficient way of achieving carbon neutrality, with e-methane being distributed through the existing gas infrastructure and combusted in existing gas appliances, requiring no large-scale investment for constructing new energy systems or modifying the existing ones.

About Osaka Gas
Osaka Gas announced the Daigas Group Carbon Neutral Vision in January 2021 for achieving carbon neutrality by 2050 mainly through the introduction of carbon neutral gas produced by methanation, decarbonization of its power sources primarily through the use of renewable energies and the reduction of carbon emissions. The company is also conducting a number of studies on developing methanation projects overseas – notably in Australia, South America, and Southeast Asia – for the commercialization of methanation technology.

About MHI
MHI Group is actively involved in programs targeting the realization of a carbon neutral society. Building a CO_2 ecosystem is central to its energy transition initiatives. As a global leader in CCUS, the company aims to accelerate this ecosystem development by seeking widespread adoption of related hardware as well as the CO_2NNEX digital platform.

About IBM Japan
Applying its experience in supporting numerous customers worldwide, IBM Japan accelerates the development of CO_2NNEX by utilizing its blockchain technology enabling highly secure, transparent, and reliable data sharing; its hybrid cloud technology for building an agile and flexible IT environment linking a cloud and existing systems; and its AI technology enabling visualization, automation and optimization of a value chain.

Figure1: The System's web site

Figure 2: Visualization of CO_2 emissions

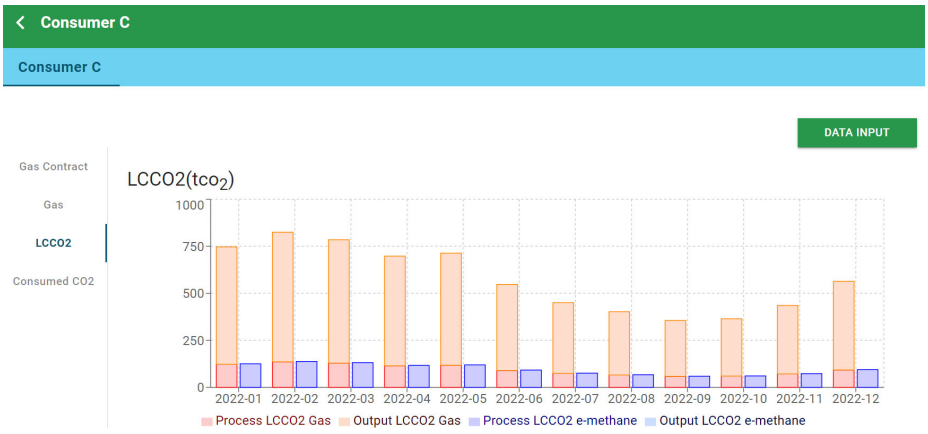

Figure 3: Transfer of e-methane's environmental value