Atomis Inc.

Demonstration Project of Next-Generation High-Pressure Gas Container CubiTan® for Establishment of New Methane Gas Supply Chain in Indonesia

Objective of the project

This project will utilize the next-generation high-pressure gas container "CubiTan," which is lightweight, compact, and IoT-compatible, to verify the feasibility of a new distribution network for methane gas (natural gas and biogas) in Indonesia. Improved transportation efficiency and safety, as well as enhanced convenience through digital transformation (DX), are anticipated. This initiative is expected to contribute to reducing dependence on LP gas, promoting decarbonization, and revitalizing the local economy. Addressing the challenges of pipeline installation in a multi-island nation and effectively utilizing untapped biogas are also key priorities.

Cooperation with local companies/governments

Counter Part

BRIN
BADAN RISET DAN INOVASI NASIONAL

- Legal compliance
- Local partner selection
- Data evaluation
- Laboratory setup

atomis

- Hardware development
- Demonstration test
- Data evaluation

Regulatory Authorities

LEMIGAS

KOMINFO

Targeted economic/social issues

Indonesia possesses natural gas and biogas resources (both primarily composed of methane), but due to an underdeveloped pipeline network, transporting methane is difficult, resulting in a heavy reliance on imported LP gas for household gas fuel. There are three main challenges related to energy gas. First, despite abundant gas resources, they are not being utilized for domestic use, and natural gas production is declining. Currently, 35% of production is exported, with the remainder primarily used for industrial purposes domestically. LP gas consumption is increasing, but domestic production is not growing, and the import dependency rate exceeded 80% in 2022. Second, due to its vast territory and over 10,000 islands, the development of a nationwide gas pipeline network is impractical, and urban gas introduction plans are progressing slowly due to budget constraints and issues such as ground subsidence. Third, bio-methane resources derived from organic waste such as POME are not being fully utilized, contributing to environmental burdens.

Atomis Inc.

Demonstration Project of Next-Generation High-Pressure Gas Container CubiTan® for Establishment of New Methane Gas Supply Chain in Indonesia

Demonstration period

January 2024 – May 2025

Details of demonstration

A demonstration test of the next-generation high-pressure gas container "CubiTan," which enables efficient transportation of natural gas and biogas that cannot be liquefied at room temperature, was conducted in Indonesia with the aim of constructing a smart gas network. Initially, it was determined that the demonstration required compliance with legal regulations spanning three fields—"radio communications," "high-pressure gas," and "energy"—as well as safety evaluations. These challenges were addressed in collaboration with relevant authorities and organizations. Hardware development was also carried out, including the fabrication of CubiTan and CubiBase for field testing. Additionally, an evaluation of the effects of impurities in natural gas on gas adsorbent A was conducted, revealing that odorants had no impact, while high-molecular-weight hydrocarbons such as propane, butane, and pentane showed potential for performance degradation. However, it was suggested that performance could be maintained by using gas adsorbent B in combination.

Project outcome / future plans

In Indonesia, we have been advancing regulatory compliance and safety evaluations for the demonstration testing of the next-generation high-pressure gas container "CubiTan." We have held discussions with Pertamina, PalmCo, and other companies involved in natural gas and biogas, as well as relevant authorities such as LEMIGAS, and are currently working to establish the institutional framework. In the demonstration tests, the CubiTan, which incorporates gas adsorbents, demonstrated performance superior to conventional types. Safety was also confirmed in over 100 repeated tests using improved adsorbents. Currently, field tests for residential use and discussions toward signing memorandums of understanding (MOUs) with energy companies are underway. The Indonesian government aims to produce the system domestically and is considering establishing production facilities within the ASEAN region. With the support of Yachiyo Engineering Co., Ltd., market research is being conducted with a view to expanding into the region. In Japan, however, legal frameworks and safety evaluation institutions are not yet in place, and the company plans to create a new market in Japan based on data obtained in Indonesia.