

December 9, 2025
Idemitsu Kosan Co.,Ltd.

A bench-scale plant for establishing mass cultivation technology of marine purple photosynthetic bacteria has been installed on Seibu Oil site, commencing demonstration in February 2026
Promoting the societal implementation of CO₂/N₂-based biomanufacturing

Idemitsu Kosan Co.,Ltd. (Head Office: Chiyoda-ku, Tokyo; Representative Director, President: Noriaki Sakai; hereinafter referred to as “Idemitsu”) has installed a bench-scale plant on the premises of Seibu Oil Company Limited (a wholly-owned subsidiary of Idemitsu; Head Office: Sanyo-Onoda City, Yamaguchi Prefecture; President and CEO: Susumu Niho; hereinafter referred to as “Seibu Oil”) to establish a technology for mass cultivation of marine purple photosynthetic bacteria^{*1}.

Idemitsu will conduct a demonstration for the mass cultivation of marine purple photosynthetic bacteria and the efficient production of green biomaterials^{*2} using useful substances stored by marine purple photosynthetic bacteria (hereinafter “the demonstration”) at the bench-scale plant, in collaboration with Symbiobe Inc., a Kyoto University-spinoff startup with extensive expertise in microbial development (Idemitsu has invested in September 2024; Head Office: Nishikyo-ku, Kyoto, Representative Director, President and Chief Executive Officer: Koji Ito, hereinafter “Symbiobe”). The plant will produce one ton of green biomaterials annually, and the demonstration operation is scheduled to begin in February 2026.

^{*1} Marine purple photosynthetic bacteria: Microorganisms capable of capturing and fixing carbon dioxide (CO₂) and nitrogen (N₂) from seawater through photosynthesis, thereby storing useful substances such as organic compounds within their bodies.

^{*2} Green biomaterials: Useful substances produced through “biomanufacturing” utilizing microbial metabolism that are related to the food and environmental fields.



Bench-scale plant interior



Green biomaterial sample

The demonstration will also verify the reduction of electricity costs required for the plant operation and the use of green energy (electricity that does not emit CO₂).

Based on the results of the demonstration, we will proceed with a phased scale-up, aiming to commence commercial plant operation and achieve commercialization by 2030. For the demonstration and subsequent scale-up, we will leverage Symbiobe’s expertise in microbial development and our own strengths in process technology^{*3} and scale-up know-how.

We have designated “Bio-Life Solutions” as one of the key focal areas within our functional materials business and are exploring the commercialization of biomanufacturing^{*4} that utilizes microbial metabolism. As part of this initiative, we are aiming to establish a technology for mass cultivation of marine purple photosynthetic bacteria and to efficiently produce green biomaterials that can be used in a wide range of fields (fertilizers, feed, fibers, etc.) from the useful substances stored by marine purple photosynthetic bacteria in collaboration with Symbiobe. Through societal implementation of marine purple photosynthetic bacteria naturally inhabiting seawater, we will contribute to biomanufacturing that leverages Japan’s geographical advantage of being surrounded by the sea.

Seibu Oil, which ceased their petroleum refining functions in 2024, aims to become a “regional industrial hub” that contributes to the local community by supplying locally produced and consumed carbon-free energy and facilitating the circulation of regional resources. Furthermore, the site was chosen for the bench-scale plant because it is located in a coastal area where seawater (necessary for cultivating marine purple photosynthetic bacteria) is readily available; exhaust gas (a raw material for manufacturing green biomaterials) can be easily obtained from existing boilers; basic infrastructure (e.g., electricity and water) and land are available; and human resources with knowledge of plant operation can be secured.

On Friday, December 5, we held a completion ceremony at Seibu Oil to celebrate the completion of the bench-scale plant. Symbiobe, Seibu Oil, and Idemitsu will further strengthen their collaboration following this completion. Based on the results obtained from the demonstration, we will proceed with studies aimed at scaling up production facilities, thus accelerating the development and societal implementation of marine purple photosynthetic bacteria for industrial use.

*3 Process technology: Technology for designing and optimizing the manufacturing processes used to manufacture products

*4 Biomanufacturing: Technology that utilizes microorganisms to efficiently produce useful substances. The application of biomanufacturing is anticipated across numerous industries, where it is expected to serve as an alternative to various manufacturing processes using fossil resources as raw materials, strengthen Japan’s industrial competitiveness, and contribute to the resolution of societal challenges.



Completion Ceremony (Senior Managing Executive Officer Nakamoto of Idemitsu)



Bench-scale plant exterior

[Reference]

- [Press Release: Investment in Symbiobe Inc., a biomanufacturing startup from Kyoto University \(September 12, 2024\)](#)
- [Press Release: Signed the memorandum of understanding for the collaboration with Symbiobe, a startup from Kyoto University \(June 5, 2024\)](#)

- Contact for Inquiries on this subject -

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