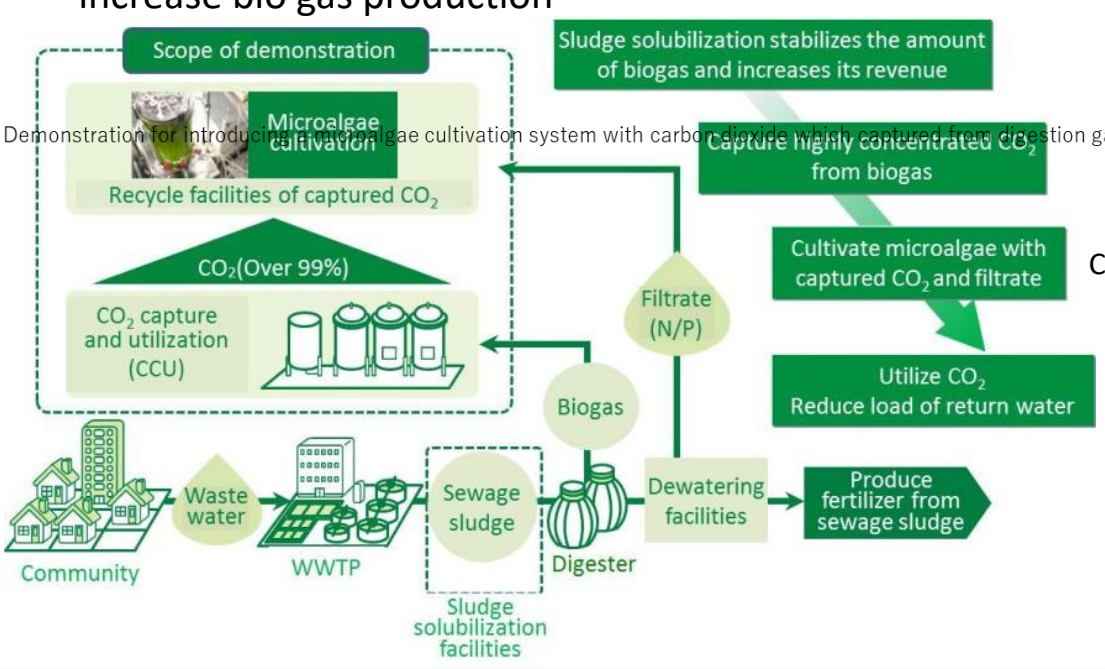
Demonstration for introducing a microalgae cultivation system with carbon dioxide which captured from digestion gas in the sewage treatment plant

Implementer: The consortium of Toshiba Corporation, euglena Co.,Ltd., Nikkan Tokushu Co., Ltd., Nihon Suido Consultants Co., Ltd., JS and Saga City

High value-added microalgae (euglena) cultivated with CO_2 from sewerage biogas and N/P from filtrate

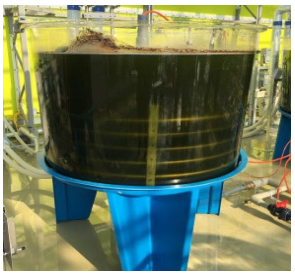
Technology Overview

- CCU (CO_2 Capture and Utilization) facilities: Separate and capture high grade carbon dioxide (CO_2) and CH_4 from sewage biogas with PSA (Pressure Swing Adsorption) method.
- Microalgae cultivation facilities: Cultivate/capture microalgae with CO_2 captured from bio gas and N and P in filtrate
- Sludge solubilization facilities (supplementary facilities) : cavitation behavior generated by high speed disk rotation solubilizes sludge to increase bio gas production



Demonstration for introducing a microalgae cultivation system with carbon dioxide which captured from digestion gas in the sewage treatment plant

CO_2 Separation/Capture facilities



Microalgae cultivation tank

Achievements

- Separation/Capture performance: more than **99% CO_2 concentration, 90% CH_4 concentration**
- Microalgae productivity: Average production rate of **0.833g/L/14days (0.542g/L/7days)**. Reduce 95% of medium cost
- Removability: Utilize **95% of T-P, 20% of T-N** in filtrate of 3 dilution magnification used for microalgae cultivation (14 day's cultivation)
- Bio gas production: **Increased by 10%** when solubilizing 1/3 of sludge supplied into digestion tank