

TECH OFFER

Affordable Green Bio-Methanol from Biogas/Biomass



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Low Carbon Economy

Sustainability - Circular Economy

Energy - Biofuels & Biomass

Chemicals - Organic

Chemicals - Catalysts

TECHNOLOGY READINESS LEVEL (TRL): **TRL5**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175361**

OVERVIEW

With the maritime industry responsible for 2–3% of global CO₂ emissions, the need for practical, safe, and affordable low-carbon fuel solutions has become increasingly urgent. While alternatives like hydrogen and ammonia show potential, they face major barriers in safety, cost, and infrastructure—particularly for long-haul shipping routes. Bio-methanol is considered a strong alternative fuel for the maritime sector, offering a practical, scalable, and safer pathway for transitioning to low-carbon marine fuels.

The technology on offer features a proprietary catalyst that simplifies the bio-methanol production process, enabling up to 50% reduction in capital and operating expenses compared to conventional methods. This approach allows renewable methanol to be produced at costs approaching that of fossil-based methanol or diesel, especially when normalized by energy density and

inclusive of carbon pricing. The process also supports circular economy goals by valorising waste into energy, further enhancing its environmental and societal impact.

By enabling affordable, scalable production of renewable methanol, this technology fills a critical gap in the clean energy supply chain, facilitating a just and profitable transition to greener shipping. It also directly addresses the maritime industry's growing demand for sustainable fuels that align with international climate targets, such as the International Maritime Organization's (IMO) net-zero emissions goal.

The technology owner is seeking for co-development and test-bedding opportunities with end-users in the maritime sector i.e., shipping companies, fuel distributors, port operators, and clean energy developers and waste biomass producers i.e., palm oil, bagasse, animal manures, municipal sewage waste.

TECHNOLOGY FEATURES & SPECIFICATIONS

This technology includes a proprietary catalyst and an optimised process to convert waste biomass into bio-methanol. Its key components include:

- Biomass-to-Biogas: Converts waste biomass to biogas (Optional)
- Biogas Conversion Unit: Transforms biogas into useful building block chemicals, H₂ and CO
- Bio-methanol Synthesizer: Production of green methanol from H₂ and CO

Some features of the bio-methanol process:

- Simplified process, thereby lowering OPEX and CAPEX up to 50%
- Ensures good quality and consistent methanol production
- Can be tailored for different waste biomass types

POTENTIAL APPLICATIONS

Potential applications of this technology include (but not limited to):

- Biofuel – as a high value bio-methanol
- Biogas – to improve energy efficiency for power generation
- Maritime - as a clean transportation fuel in shipping to meet IMO's target and avoid carbon emission penalties
- Producers of organic waste i.e., agriculture, sewage treatment plants, farming – as a method to transform waste for profit
- Green chemical feedstocks i.e., downstream processing of bio-methanol for green chemicals and derivatives

UNIQUE VALUE PROPOSITION

- Simplifies the operational process of converting biogas into green bio-methanol
- Reduces the cost of bio-methanol product by up to 50%
- Supports the transition to clean energy by offering good quality bio-methanol