PRIMUS GREEN ENERGY™
Your GTL Partner™

The Primus Gas-to-Methanol System
Simple. Local. Economical.

The Increasing Demand for Methanol

Global demand for methanol is expected to increase from 60.7 MMT in 2013 to more than 109 MMT in 2023, with an average annual growth rate of 6 percent (IHS). As one of the most versatile chemical compounds, methanol is used in numerous applications, including for fuel, solvent, antifreeze and for making biodiesel fuels. Methanol production, however, is currently limited to only a few large-scale plants around the world, resulting in high transportation costs for users who are not located within close proximity to a production facility.

"This is a magical place…"
The New York Times.

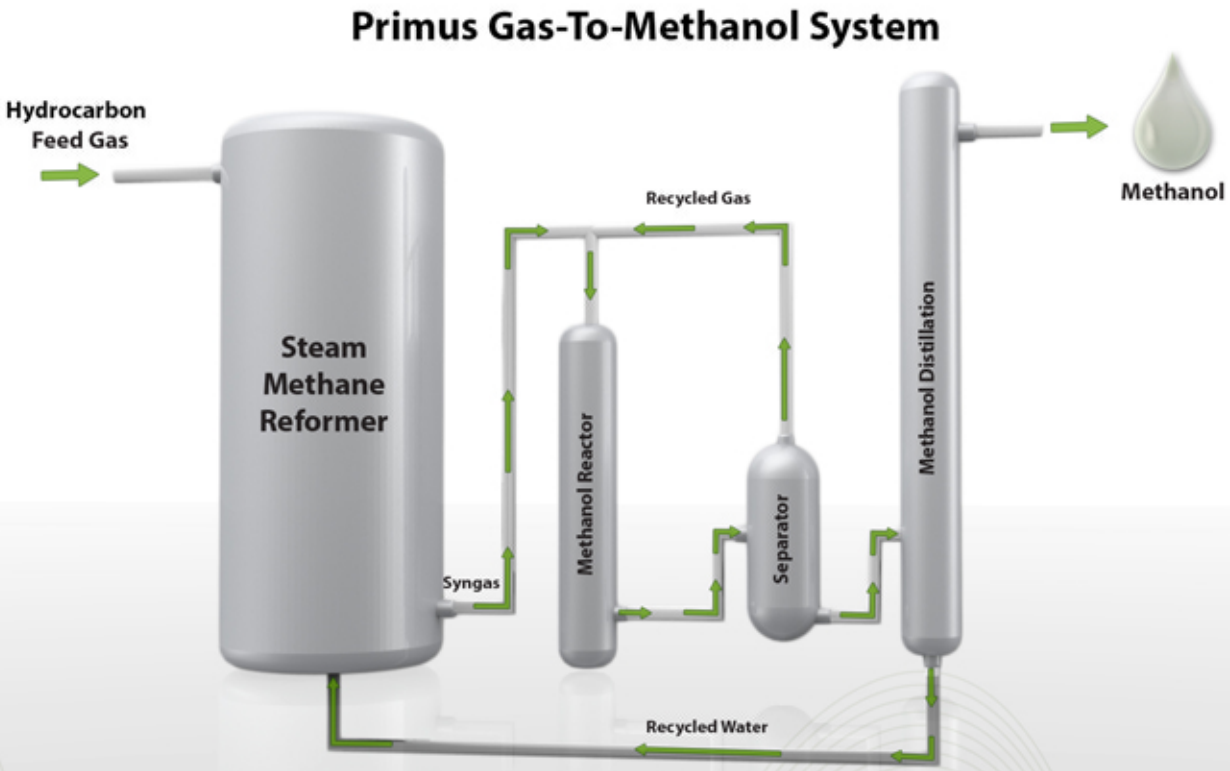
Primus' Gas-to-Methanol System: Meeting Demand at Local Scale

Primus Green Energy's gas-to-methanol (GTM) System can produce AA-grade methanol onsite in any location where there is a feed gas source or where methanol is in demand. Primus' GTM units produce methanol at small, medium or large scales. The simple, economical process accommodates a range of feedstock types, including associated gas, natural gas, ethane and natural gas liquids. Due to its integrated design, the system is cost-effective at scales as small as 160 metric tons per day of methanol, providing users with an ideal opportunity to capitalize on their natural gas resources while meeting local methanol demand.

How it works

The Primus Gas-to-Methanol process is comprised of three steps:

1. **Steam Methane Reforming -** Natural or associated gas reacts with steam at a high temperature and pressure to produce syngas.
2. **Syngas to Methanol Reaction -** Syngas reacts in a catalytic fixed bed reactor that converts the syngas to methanol.
3. **Distillation/ Separation –** The water/methanol mixture is separated from other gases, and then fed to a distillation column system that is designed to meet the user's methanol purity requirements. On-spec methanol is collected from the top of the column, water is reused to make steam for the reformer and off-gas is recycled as feed or fuel to the reformer.



High Quality Product: Methanol

Primus methanol is a high quality product that meets the typical specification requirements for methanol. The Gas-to-Methanol system can be designed to meet any user's methanol quality specifications. The methanol end product can be easily transported by truck or rail for use as:

- Biodiesel blending component
- Petrochemical industry feedstock
- Injection agent in oil and gas wells
- Windshield washing and deicing fluid component
- Gasoline additive

Flexible Feed Gas Requirements

- Pipeline natural gas
- Associated gas (dry or wet)
- Syngas
- Dry or wet gas with no limits for C2, C3 & C4
- CO_2 up to 25 percent

Attractive Economics

- Cost effective at scales as small as 160 metric tons methanol per day
- One of the best conversion efficiencies in the GTL market
- Lower capital and operating costs
- Affordable, long-lifetime catalysts
- Minimal labor requirement – single operator during normal plant operation, remote operation available

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