UPGRADING CO_2 WASTE FROM ETHANOL PROCESSING

CAPTURE WASTE CO_2 AND PRODUCE HIGHLY PROFITABLE, SUSTAINABLE, and COMMUNITY FRIENDLY GREEN METHANOL

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Executive Summary

Ethanol plants currently vent billions of tons of biogenic CO_2 into the atmosphere each year

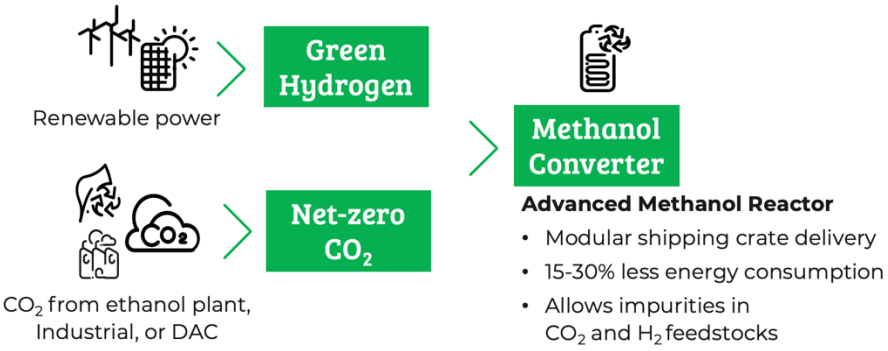
Ethanol plants each emit an average of 260,000 tons of CO_2 into the atmosphere. This is wasteful in two ways. First, more CO_2 is being added to the atmosphere. Second, that CO_2 is *valuable* as biogenic net-zero CO_2. Biogenic CO_2 ($bioCO_2$) is the key ingredient for a diverse and valuable family of net-zero chemicals. Green methanol (net-zero methanol, also called eMethanol) is the simplest and in extremely high demand.

When green methanol is burned or consumed it is net zero, adding *no new CO_2* to the atmosphere. It is in high demand by large chemical companies and cargo shipping companies looking to reduce their fossil footprint. Conventional diesel engines can be modified to run on either diesel or green methanol. Methanol burns with no waste products, and even if spilled, causes little or no environmental damage. To get a sense of the coming demand for green methanol consider Maersk, the world's largest shipping company. They seek to purchase 5.5 million metric tonnes of green methanol in the year 2030 *just for their own needs*. This amount of green methanol would require the total output from 40 ethanol plants!

The typical ethanol plant could be producing 160,000 tonnes (32 million gallons) per year of net zero green methanol with a **market value of $160 million injected into the local economy** near an ethanol plant. In the US and Canada there are 195 such Ethanol plants suitable for the upgrade proposed here.

How it works.

The diagram to the right shows the key components. We are using advanced methanol technology that is both efficient AND easily deployed at an ethanol plant. The methanol reactor uses new catalytic techniques that allow some impurities in the CO2 and H2 while using 15-30% less energy than more conventional techniques. Beyond the advanced chemistry and engineering, our approach packages all the equipment in a conventional shipping crate that can be easily installed at an ethanol plant.



Project Team

We have assembled a world class team to support and drive the project:

- Jeff Bonar, Ph.D Computer Science – Project Lead – experienced project manager for innovative initiatives involving complex mixes of stakeholders, industrial equipment, and monitoring.
- Eric Melvin, B.S. Chemical Engineering – Chemical industry decarbonization and plant operations.
- National Corn Ethanol Research Center at Southern Illinois University at Edwardsville. Their senior scientist and process engineer will be working closely with us to ensure optimal initial deployments
- Geoffroy Mattlinger, MBA, Sorbonne - Recently sold CryoPure, leader in biogas valorization, expert in process and infrastructure for renewable chemistry and energy
- Michael McNeill, Ph.D Agronomy – leading exponent of organic and regenerative agriculture, deeply embedded in the Iowa agriculture community, extensive political, research, and community contacts.
- Siobhan Fathel, Ph.D Agricultural Engineering, Penn State Agricultural Extension – Leads team doing community and farmer education in sustainability, biofuels, and bioCO2.