



Use CO₂ to Store Energy

Profitably Upgrading Carbon Dioxide

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With Thanks and Acknowledgement to the
Department of Energy Office of Energy
Efficiency and Renewable Energy

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**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

The CO₂ Challenge for Ethanol Refiners

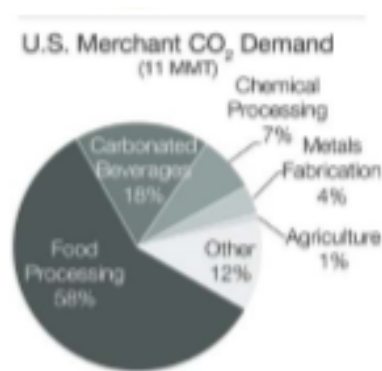
Bioethanol Refineries co-produce large amounts of high-purity CO₂

But CO₂ supply in the U.S. exceeds market demand by 5x

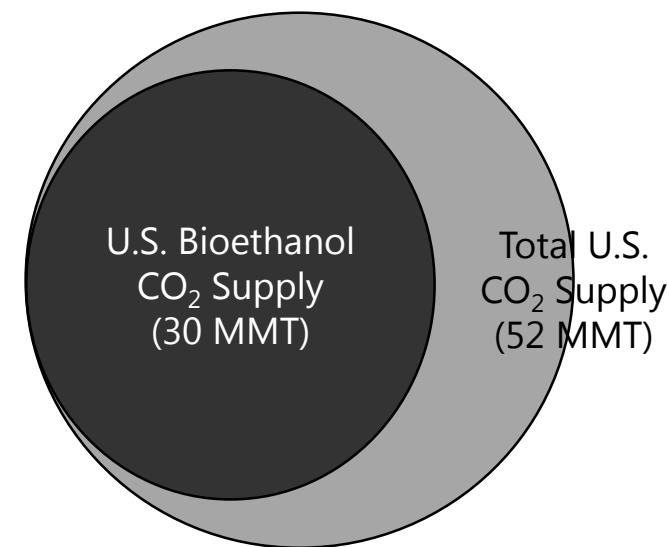
Resulting in a very low market price for CO₂



= 2.2 kg of CO₂



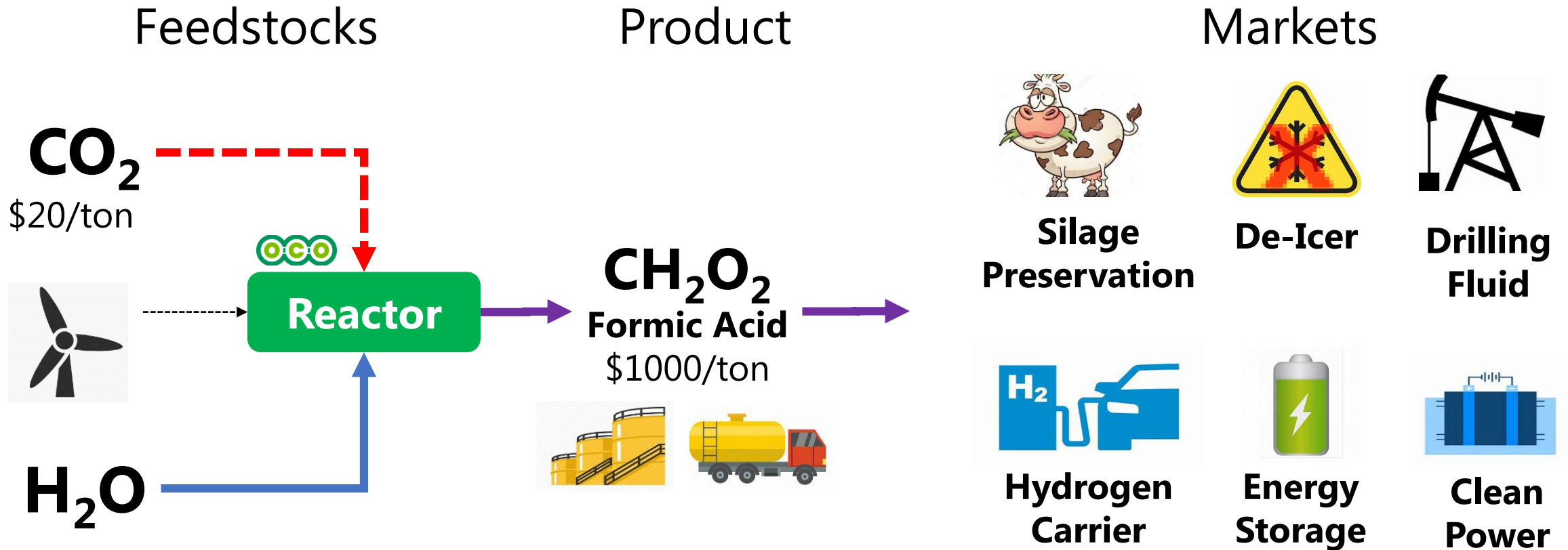
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CO₂ Price = \$0.02/kg of CO₂

Our Solution

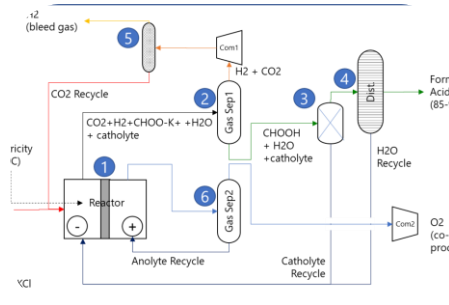
Upgrade the value of CO₂ by 50 times (\$20 -> \$1000/ton) into a zero-carbon chemical and fuel at a 30% lower cost than existing fossil-based synthesis routes



- ! OCO's FA process and product qualify for up to \$247/ton_CO₂ tax credits (e.g. 45Q)

Commercialization Traction

OCO is Planning its Final Commercial Scale-Up Stage Starting in January 2020



Raised Funds

- DOE-EERE Award
- DOE-NETL Award
- Angel Capital
- Founder Capital

Scaling-Up

- Phase 1 of 3 New Scaled-Up Pilot Plant Commissioned in Ohio in July

Final Design

- Final Full-Size Cell and Balance of Plant Design
- Development with Eqpt. Manufacturer

First Customer

- Deployment of FA-fueled 250 kW Back-up Power Generation Unit for Northwest Utility

First Full Plant

- Looking at co-located partner sites to build and operate the world's only zero-carbon FA full-scale (1 tpd) process demonstration plant



We are Looking for Great Partners Interested in Improving Bio-ethanol Refinery Operating Margins by \$0.50/gallon



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Thank You!

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