



High-Efficiency CO₂-to-Renewable Natural Gas Conversion

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HIGHLIGHTS

- **Next-Gen Bioconversion:** A high-rate platform that transforms captured CO₂ into high-value Renewable Natural Gas (RNG).
- **Dual-Enhanced Performance:** Integrates proprietary physical and biological accelerators to bypass traditional limits in gas-to-liquid mass transfer and microbial kinetics.
- **Commercial Scalability:** Overcomes the primary engineering bottlenecks, solubility and biofilm density, that have historically hindered the commercialization of bio-electrochemical systems.

OPPORTUNITY

Current Carbon Capture and Utilization technologies often struggle with low throughput and high-energy intensity. Specifically, Microbial Electrosynthesis (MES) systems are frequently limited by poor CO₂ solubility and sluggish microbial activity at the cathode.

Researchers at the University of Alberta have developed an advanced conversion platform that addresses these constraints through a coordinated enhancement of system performance. The approach improves how carbon is delivered and how microbial communities function, enabling substantially higher fuel production rates. By aligning these improvements, the technology offers a strong pathway toward scalable biogas upgrading and the generation of carbon-neutral renewable methane.

COMPETITIVE ADVANTAGE

- **Modular & Scalable:** The combined physical-biological strategy is designed for integration into existing industrial emissions infrastructure, offering a clear path to commercial-scale RNG production.
- **High-Rate Methane Yields:** Outperforms standard bio-electrochemical benchmarks, providing a clear advantage for energy providers and carbon-heavy industries.

STATUS

- Patent pending.

INVENTORS

- [Dr. Bipro Dhar](#) and team

MORE INFORMATION

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