

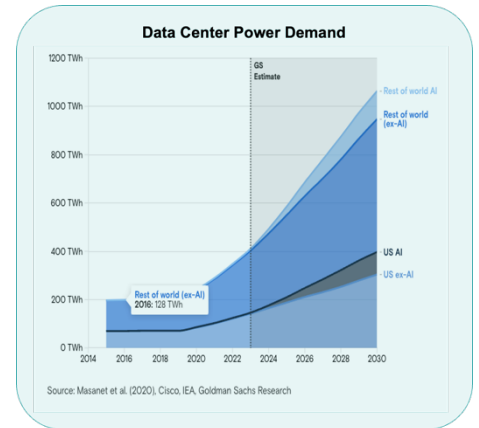
GRIMES CARBONTECH (GCT)

Use Case: Powering Data Centers with Green Hydrogen

The challenge: Data centers are creating an unprecedented demand for energy. They represent the fastest growing sector measured by the amount of energy they consume, with artificial intelligence (AI) responsible for a 160% increase in consumption per data center. A single ChatGPT query requires almost 100 times as much energy as a Google search (2.9 watt-hours versus .3 watt-hours).

By 2030 data centers will consume 8% of available power in the U.S. versus 3% in 2022, and, at that point, U.S. utilities will need to have invested \$50 billion in new capacity just to keep them running. That means an additional three billion cubic feet of natural gas per day, along with the requisite pipeline infrastructure. And demand for energy continues to grow at a compound annual rate of 2.4%, with 0.9% of the demand coming from data centers.

Even if we're able to generate sufficient energy to keep up with demands, there's another daunting barrier: our aging electric grids, which will require several trillion dollars in upgrades to support growing worldwide demand for energy.

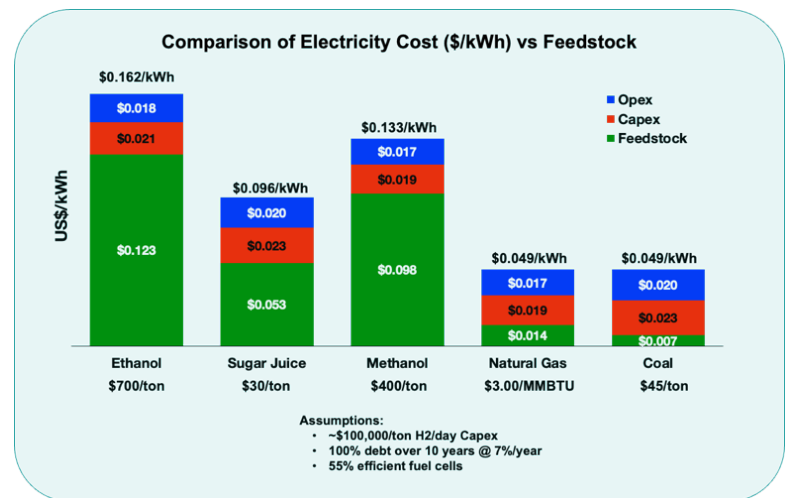


Using GCT's proprietary approach, integrating power generation and heat recovery, data centers can cut their demand for electricity by 50%.

How do we do it? The short answer is electrochemical engineering. GCT converts sugar juice – or any available organic material – into methanol and further refines the methanol to create green hydrogen, using a process known as Caustic Aqueous-Phase Electrochemical Reforming (CAPER).

Our CAPER process

- Can operate on low-cost, raw ethanol or blue hydrogen derived from natural gas or coal
- Can be coupled with our carbon capture and reuse (CCR) process to convert and recycle fossil carbon to make cost-competitive syngas or other liquid fuels
- Is safely transported to your site in modular, stackable shipping containers to provide unparalleled system reliability
- Integrates power generation and server cooling, enabling data centers to reduce their demand for electricity by up to 50% of current and projected totals
- Operates on waste heat (<200°C) and in liquid-phase, eliminating the need for gas-phase compression, a major cost



With GCT's proprietary technology, data centers can use low-grade waste heat to produce hydrogen onsite and on-demand, with zero or negative carbon footprints.

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