

GRIMES CARBONTECH (GCT)

Use Case: Producing Green Hydrogen from Sugar

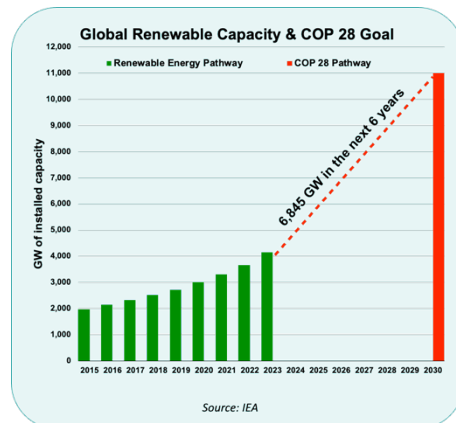
The challenge: Demand for green energy far exceeds current production capacity. Renewable energy currently provides approximately 14% of the world's energy, with wind and solar comprising 5-6% the current renewable supply. But the intermittent nature of wind and solar mean that they can't be relied on to provide sufficient baseload capacity to existing power grids. In addition, grid capacity is limited – as anyone who has experienced a blackout during an extended period of extreme heat knows all too well.

The opportunity: Sugar produces 2.4 billion tons of waste per year on 20 million hectares of land. And we are not currently using all the available land. There are 15 million hectares of usable land that is idle or undeveloped and approximately 2 billion hectares of semi-arid, non-food producing land available worldwide, which could be used to grow agave. Why agave? It's an excellent feedstock, requiring little water and no fertilizer, for producing affordable, green hydrogen energy without competing with food production.

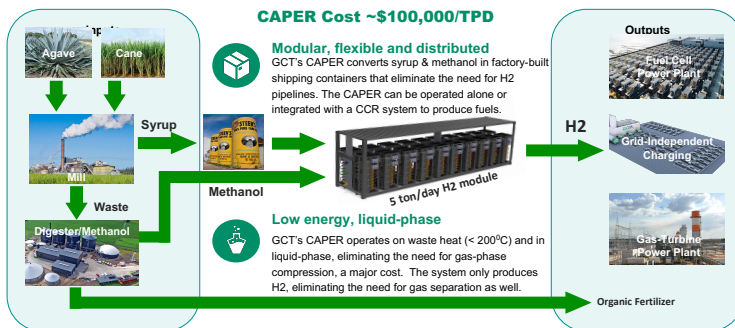
This is where GCT comes in: We have the only method for producing green hydrogen and electricity from sugar and sugar waste.

Our process:

- Converts sugar juice directly to green hydrogen and converts the sugar waste products to methanol, which is subsequently used to produce more green hydrogen
- Eliminates the need for fossil-derived fuels and fertilizers for growing, harvesting & transport
- Produces a benign syrup, which is easily and safely transported and stored where it's needed to produce hydrogen onsite and on demand
- Enhances the value of a sugar farmer's land, as one hectare of sugar cane can produce 1.6 tons of hydrogen per year from the sugar and another 1.5 tons from its waste
- Turns semi-arid land into a high-value commodity by using it to grow agave, which, after a 5-year growth cycle will produce 16 tons of hydrogen per year from its sugar and another 13.5 tons from its waste on a single hectare of land.



✓ **CAPER of syrup & bio-methanol creates affordable Green H₂**
Electrical efficiency can increase as much as 50% over conventional plants



In other words, GCT's electrochemical process, known as Caustic, Aqueous-Phase Electrochemical Reforming (CAPER), doubles the value of the land used for growing sugar, creates the first high-value use for the world's semi-arid land and enables the rapid scale-up of green hydrogen energy.