

Green H2 more profitable than Sugar

Grimes Carbon Tech (GCT)

A net negative green technology company changing the world

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CAPER (Caustic, Aqueous-Phase, Electrochemical Reforming)

Distributed CAPER systems using low-grade waste heat to produce hydrogen on-site & on-demand with a zero or negative carbon footprint

CCR (Carbon Capture & Reuse Technology)

CCR technology that converts CO2 into Sustainable Aviation Fuel (SAF) at the cost of conventional, fossil-derived, Jet A fuel

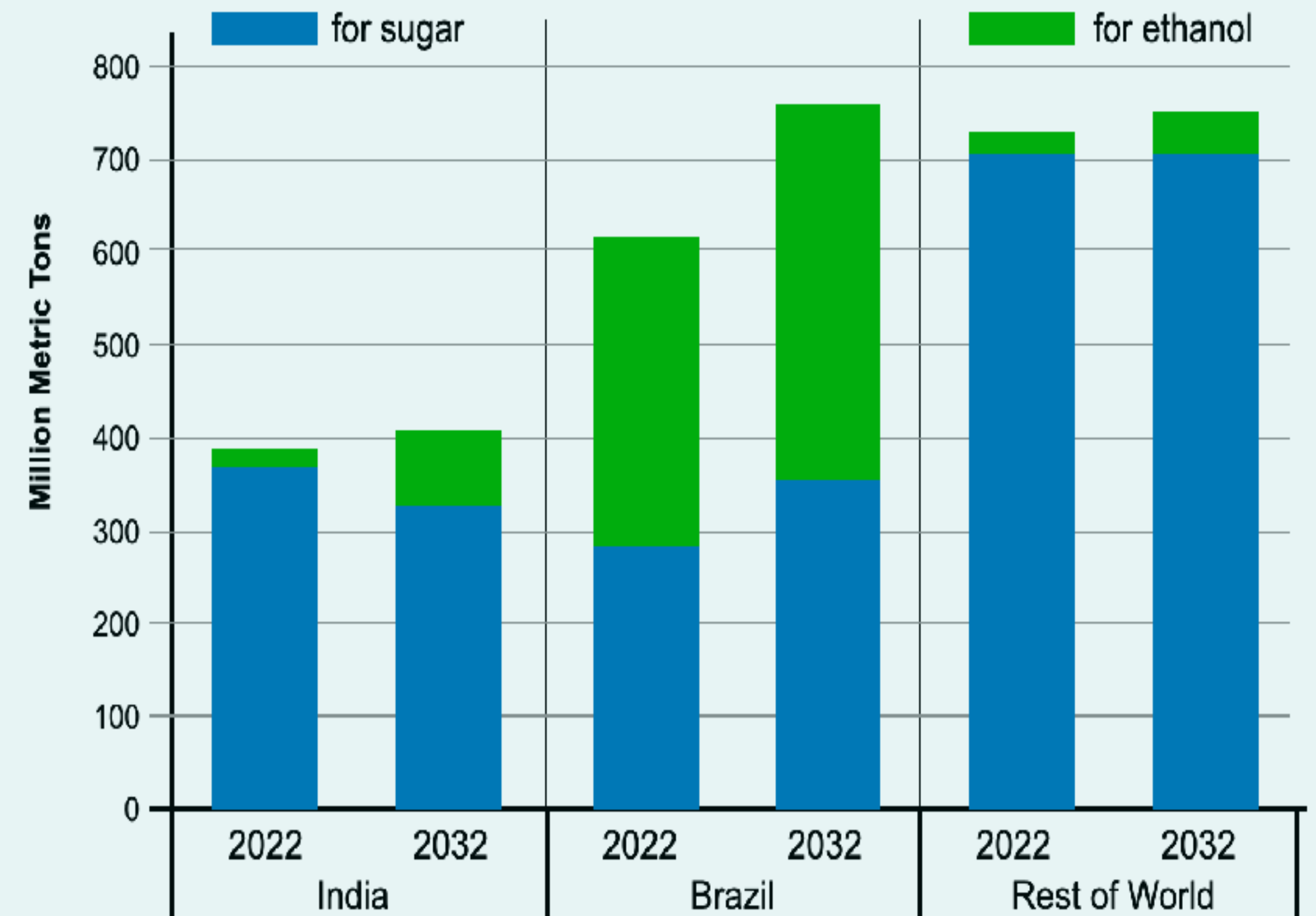
🌿 Limited growth opportunities for sugar growers & mills

Profit margins on both sugar & ethanol are low & volatile

Although green cane processing requires;

- Sugar cane requires substantial fossil fuel for planting, harvesting & transport ~4-5 liters of diesel equivalent (LDOE) per ton of cane.
- Milling & processing requires about four times as much energy, most of which is provided by burning bagasse.
- Fossil-derived fertilizers add the equivalent of another 10 LDOE per ton of cane.
- Conversion of sugar to ethanol requires significant increases in both capital & operating costs.
- US costs make both sugar & ethanol expensive compared to other producers.
- Carbon emissions, land & water issues & market conditions restrict growth opportunities.

Cane for Sugar & Ethanol Production to 2030



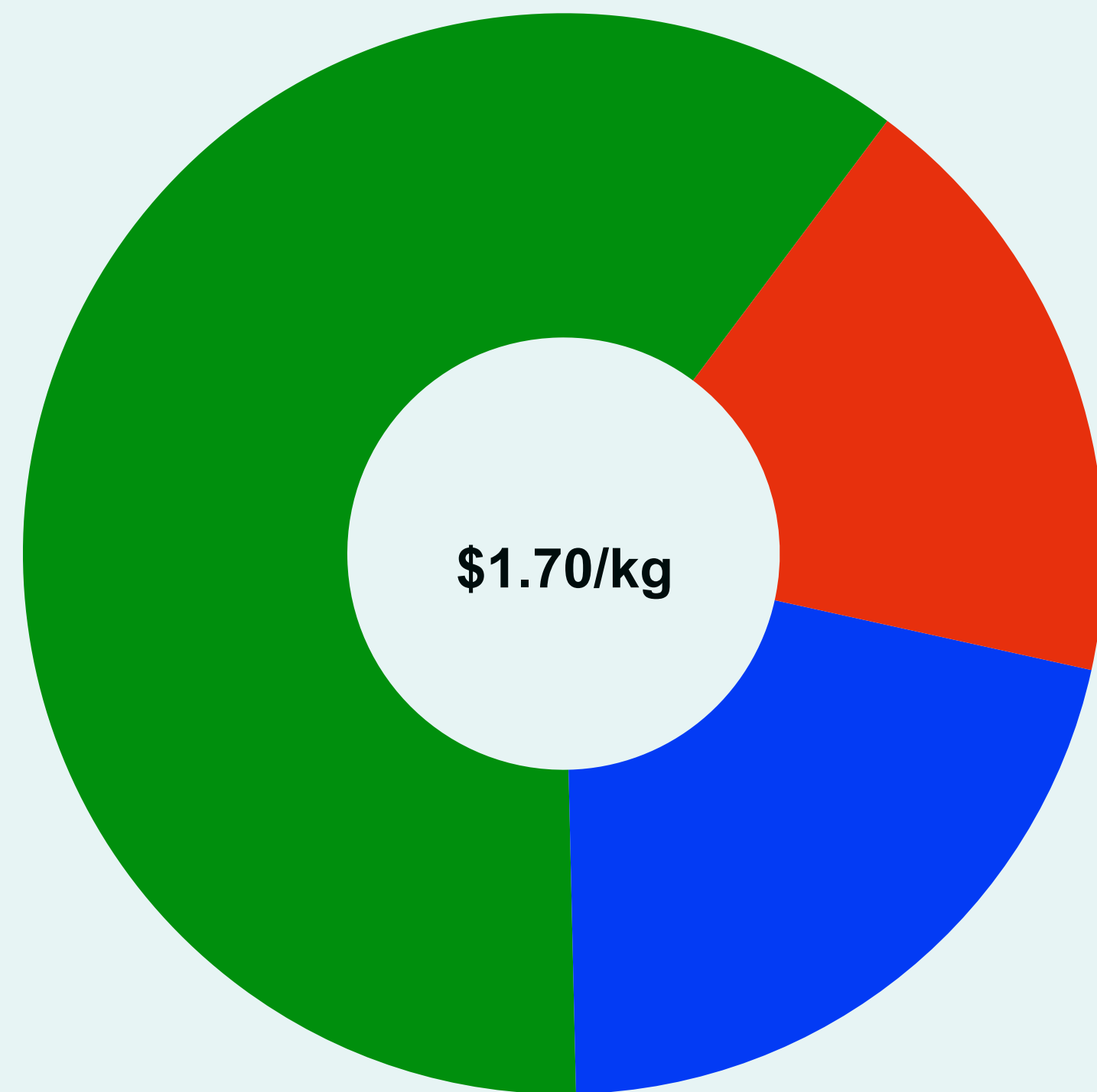
Source: UN FAO

GCT systems offer unprecedented profit opportunity

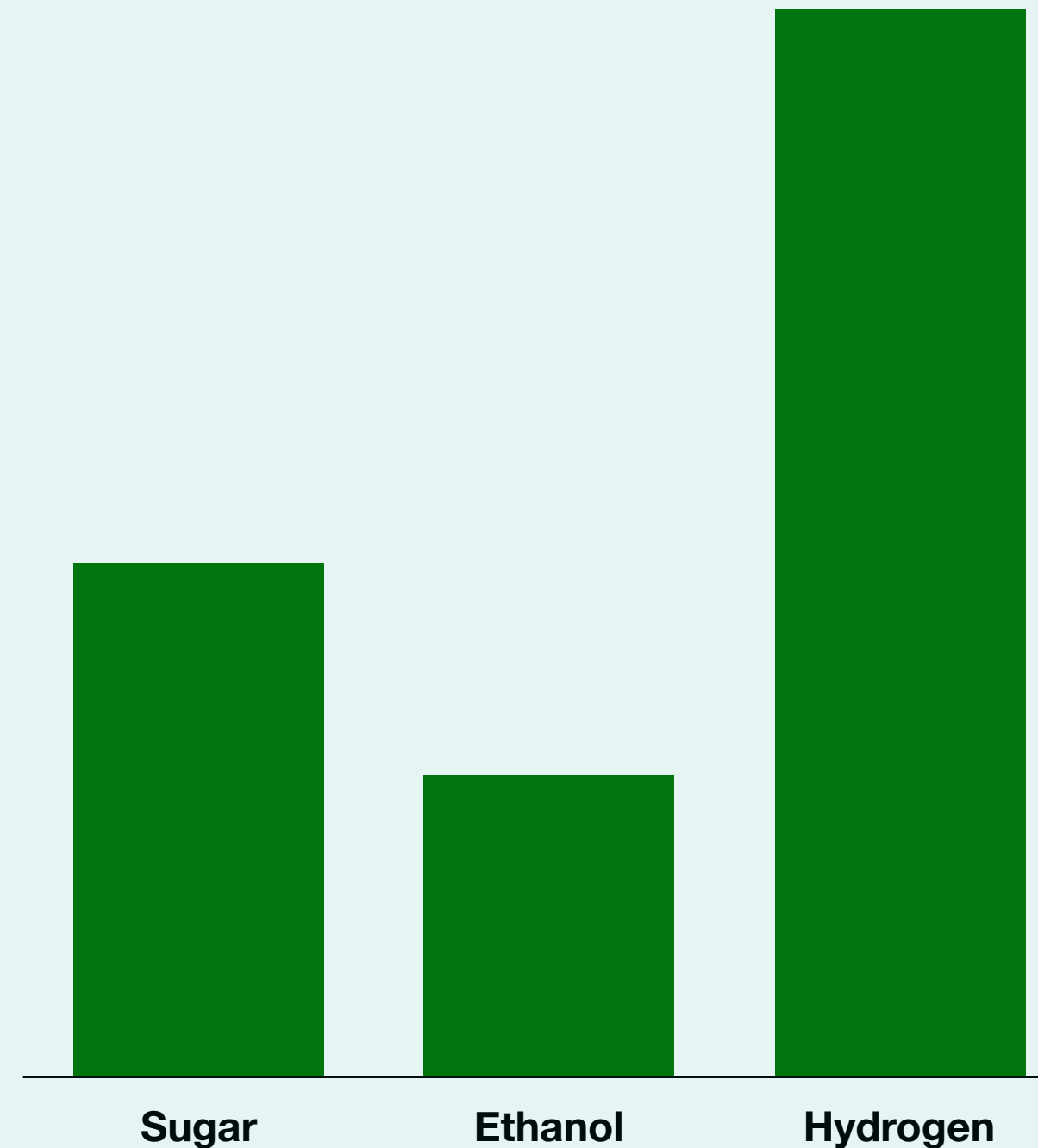
50% reduction in energy consumption & method of monetizing waste

Cost of Green H2 & Revenue per Ton of Cane Options

Cost of Green H2 (\$/kg)



Revenue per Ton of Cane



Assumptions:

- Sugar Juice @ \$30/ton
- 100% debt over 10 years @ 7%/year
- 55% efficient fuel cells

GCT CAPER process:

- Can use sugar juice directly & all waste by converting it to methanol & then Green H2.
- Eliminates the need for fossil-derived fuels and fertilizers.
- The benign syrup is easily transported & stored with no safety issues.
- One hectare of cane can produce 1.6 tons of H2 per year from sugar & another 1.5 tons from its waste.
- Will reduce mill operating expenses by ~50% & eliminate the need for any fossil fuels for planting & harvesting.
- GCT's CAPER process will double the value of sugar land & create the first value for semi-arid land.

CAPER of syrup & bio-methanol creates affordable Green H2

Electrical efficiency can increase as much as 50% over conventional plants

CAPER Cost ~\$100,000/TPD

Modular, flexible and distributed

GCT's CAPER converts syrup & methanol in factory-built shipping containers that eliminate the need for H2 pipelines. The CAPER can be operated alone or integrated with a CCR system to produce fuels.

Low energy, liquid-phase

GCT's CAPER operates on waste heat (< 200°C) and in liquid-phase, eliminating the need for gas-phase compression, a major cost. The system only produces H2, eliminating the need for gas separation as well.

Inputs



Agave



Cane



Mill

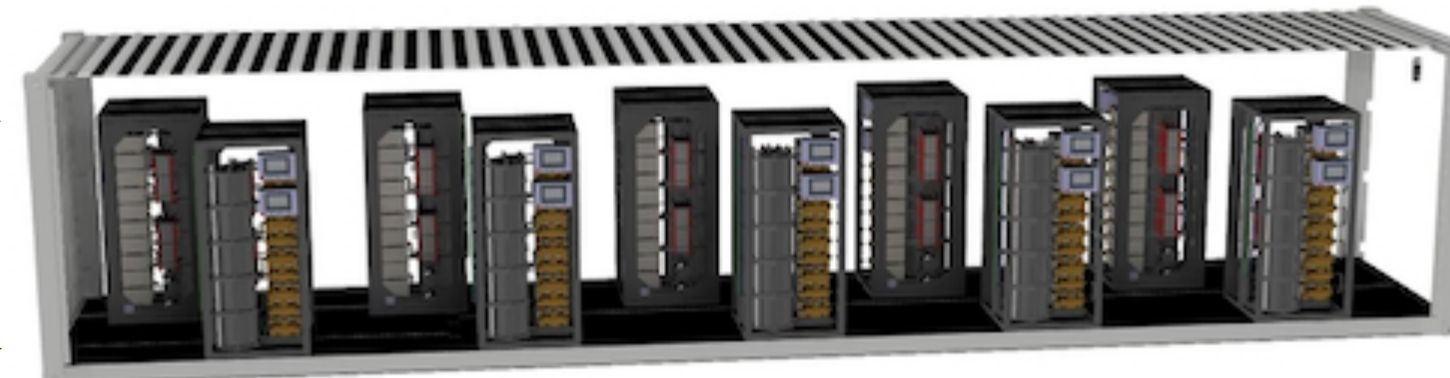


Digester/Methanol

Syrup



Methanol

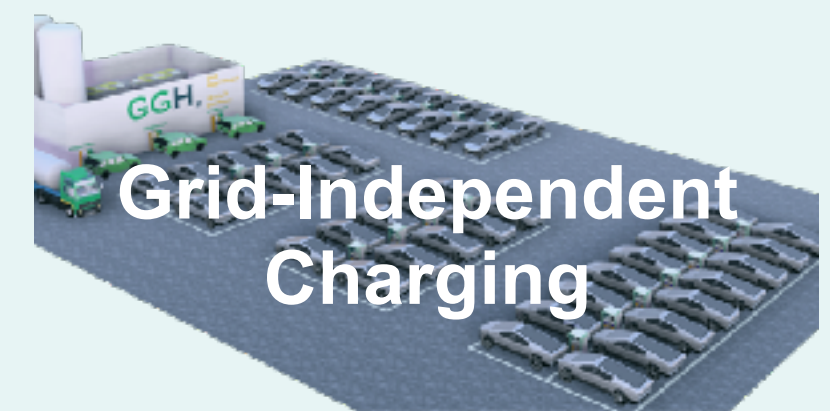


2.5 ton/day H2 module

Outputs



Fuel Cell Power Plant



Grid-Independent Charging



Gas-Turbine Power Plant

Organic Fertilizer