

# Closed-Loop, Zero-Carbon Marine Fuels

## Grimes Carbon Tech (GCT)

A net negative green technology company changing the world

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### **Cost-Competitive E-Fuels from intermittent solar & wind**

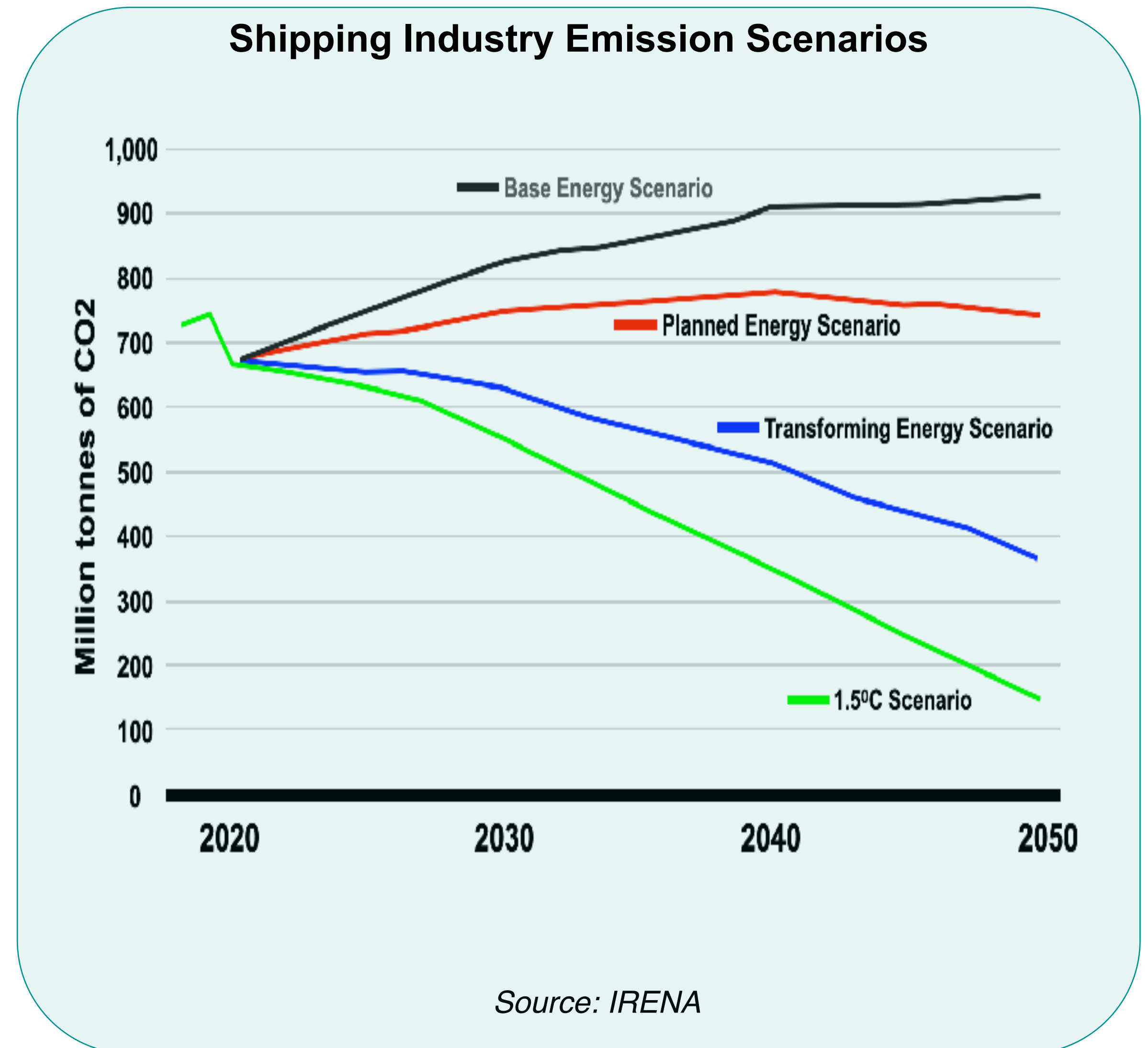
CCR technology that converts CO<sub>2</sub> & renewable electricity into sustainable methanol, diesel or other fuel, at the cost of conventional, fossil-derived alternatives

# Shipping fuel needs are growing along with pressure on GHG emissions

## Shipping emits 3% of total GHG emissions and will increase by up to 250% by 2050

### Green alternatives are being widely sought

- International Maritime Organization (IMO) reports that in 2018 global shipping energy created around one billion tons of CO<sub>2</sub>.
- International shipping energy demand grows in lockstep with worldwide GDP growth.
- Fuel represents between 50-70% of the total operating costs of a ship, depending on ship size, type and duty cycle
- The International Renewable Energy Association (IRENA) estimates that over 700 million tons of emissions will have to be eliminated to reach the 1.5°C goal.
- New clean fuel targets of 20% by 2030 & 70% by 2040 seem unattainable with current technologies.



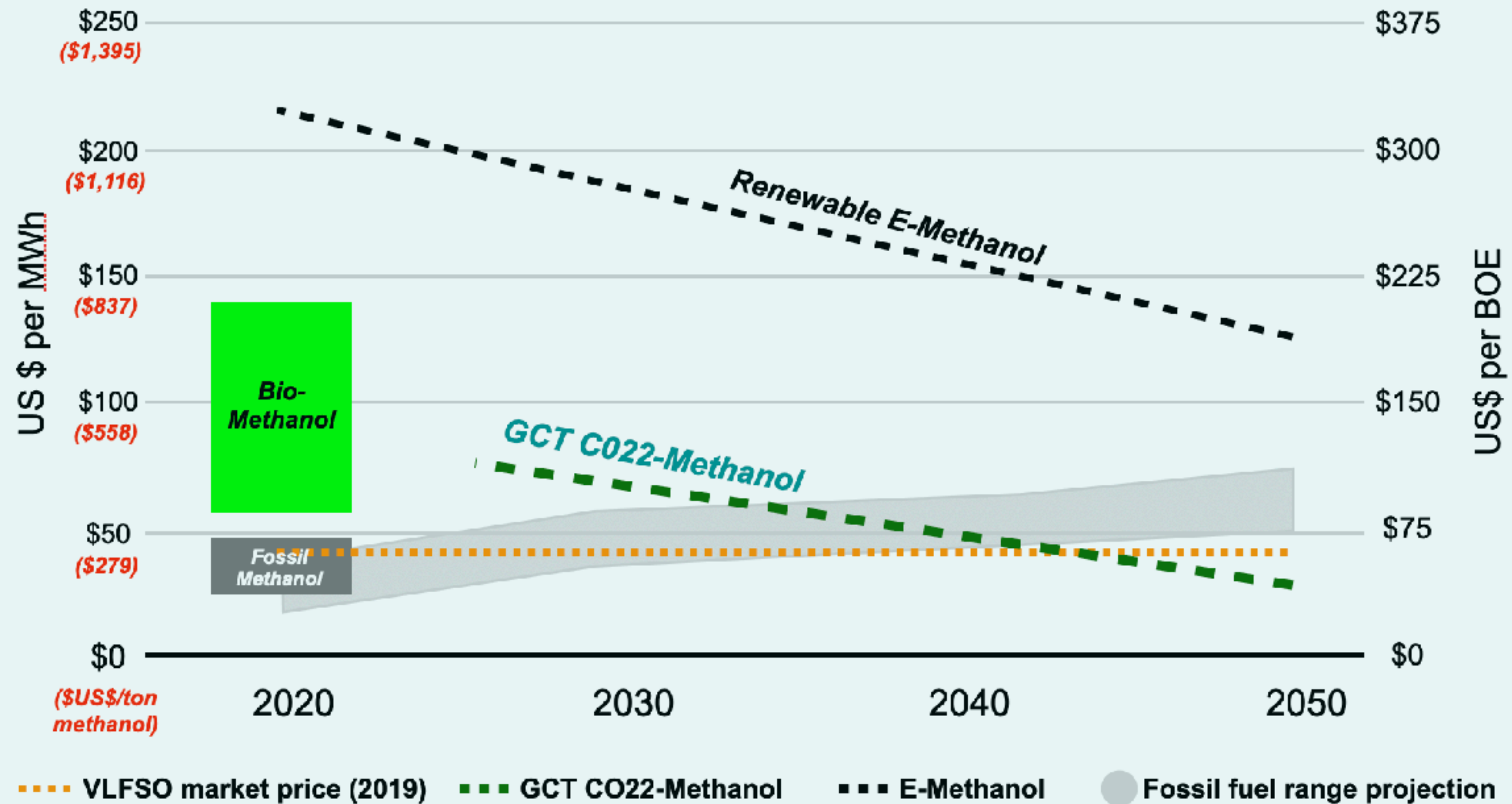
# GCT H2 & Methanol offer competitive fuel cost without subsidy

Closed loop fuel synthesis couples carbon reuse with renewable electric sources

## GCT CO2-Fuels Process:

- The only cost-competitive, efficient, zero carbon fuel for the future, up to 40% more efficient than fossil fuels.
- Cost-effective, modular construction can be quickly scaled to meet demand
- Requires one-off purchase of electrolyte, which is then recycled on each trip indefinitely to create methanol and/or Hydrogen fuel.
- Only input required after initial electrolyte purchase is electricity. One shipping container produces 5.5 tons of Methanol/day.
- Can be coupled directly to intermittent renewable plants without the need for a grid connection.
- Zero-carbon footprint fuel on its maiden voyage and becomes more negative with each subsequent use

Comparison of GCT H2 & Methanol to other fossil & renewable fuels



Sources: IRENA & Lloyds Register (2019)

1 ton of methanol = 333 gallons = 7.92 bbls = 1,258 liters

# CO2-Methanol can use intermittent solar & wind to make fuels

## Zero & Negative Carbon fuels at prices competitive with oil, without subsidies

