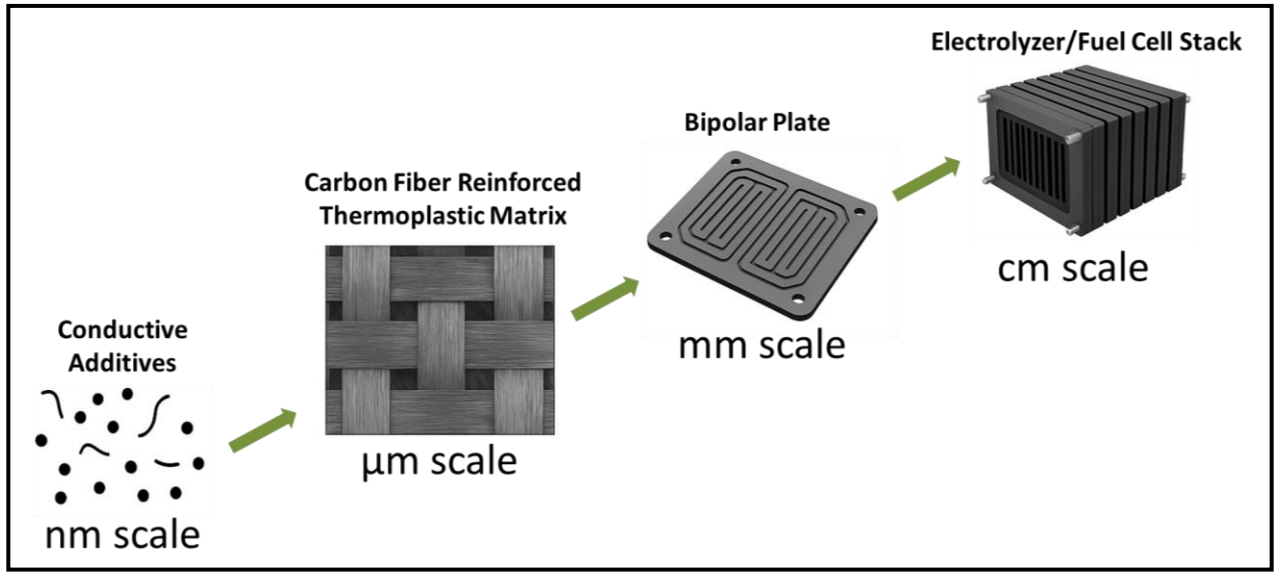
Hycomplate

Enabling next-generation high-performance bipolar plates



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Carbon13

eit JUMPSTARTER
Funded by the European Union

ClimateLaunchpad

Underperforming Bipolar Plates and Outdated Manufacturing

Published 02/17/2025

Composite bipolar plates provide 81% improvement to hydrogen fuel cell power density

Source: CompositesWorld

Bipolar plate corrosion can lead to increased voltage drop due to increased contact resistance. In addition, corrosion products can leach into the MEA and poison the ionomer in the catalyst layer or the membrane.

Source: DOE, US

Bipolar Plate (BPP)	**Considerable effort needed to achieve high volumes without many simultaneous production lines**

Source: DOE, US

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The Pain

Weight

Accounts for **60–80%** of total stack weight, limiting system efficiency.

Material

Metals are heavy and corrosive, **reducing durability.**

Manufacturing

High-volume production requires major effort and **multiple lines** (DOE, US).

Cost £

Represents about **30%** of total stack cost, impacting scalability.

Temperature

High operating temperatures **(>80 °C)** accelerate corrosion and **performance loss.**

Performance

Power density/efficiency and life cycle impact remain **key bottlenecks** (APC, UK).

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The Gain

IP Strategy = Material(s) + Process(es)

Scalability

Mass-production for **cost-effective**, large-scale deployment

Sustainability

Recyclable and reusable composites **reduce environmental impact**.

Stability

No degradation observed in VRFB testing (competitor data).

Design

Generative-design of plate and flow channels optimized for efficiency.

Lightweight

Significantly lower weight for **improved system efficiency** and portability.

Durability

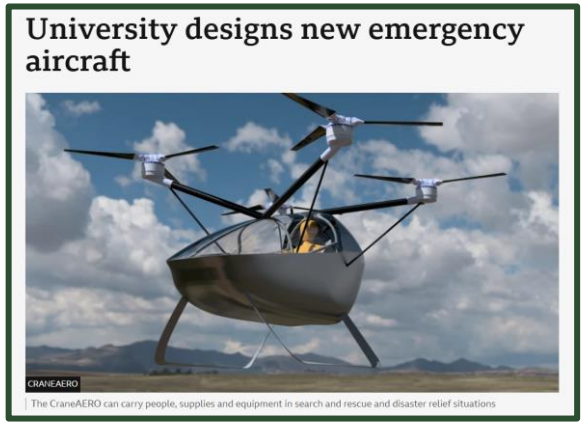
30,000 hours lifetime vs **10,000** hours for conventional materials (competitor data).

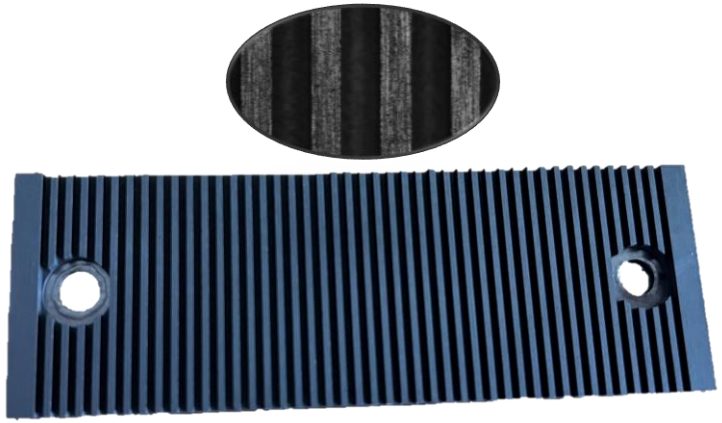
Performance

+81% increase in fuel cell power density for superior output (competitor data).

Momentum

- 2+ years self-funded development
- Supported by Future Frontiers Fund → TRL 4
- 15+ customer interviews
- Expert endorsement
- Letter of Intent from Cranfield Drone Technology and fuel cell demonstrator on their drone as range extender





Commercial plate

5.98 gram

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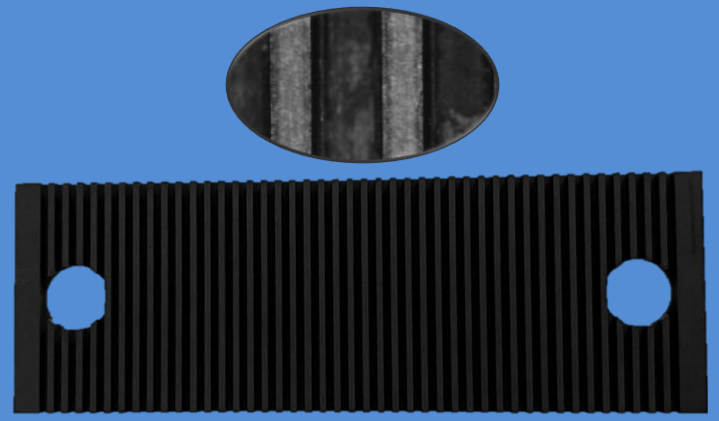


representative

Hycomplate's plate

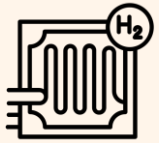
2.91 gram

Fields of Application

Hydrogen Fuel Cells

Electrolyzers

Flow Batteries

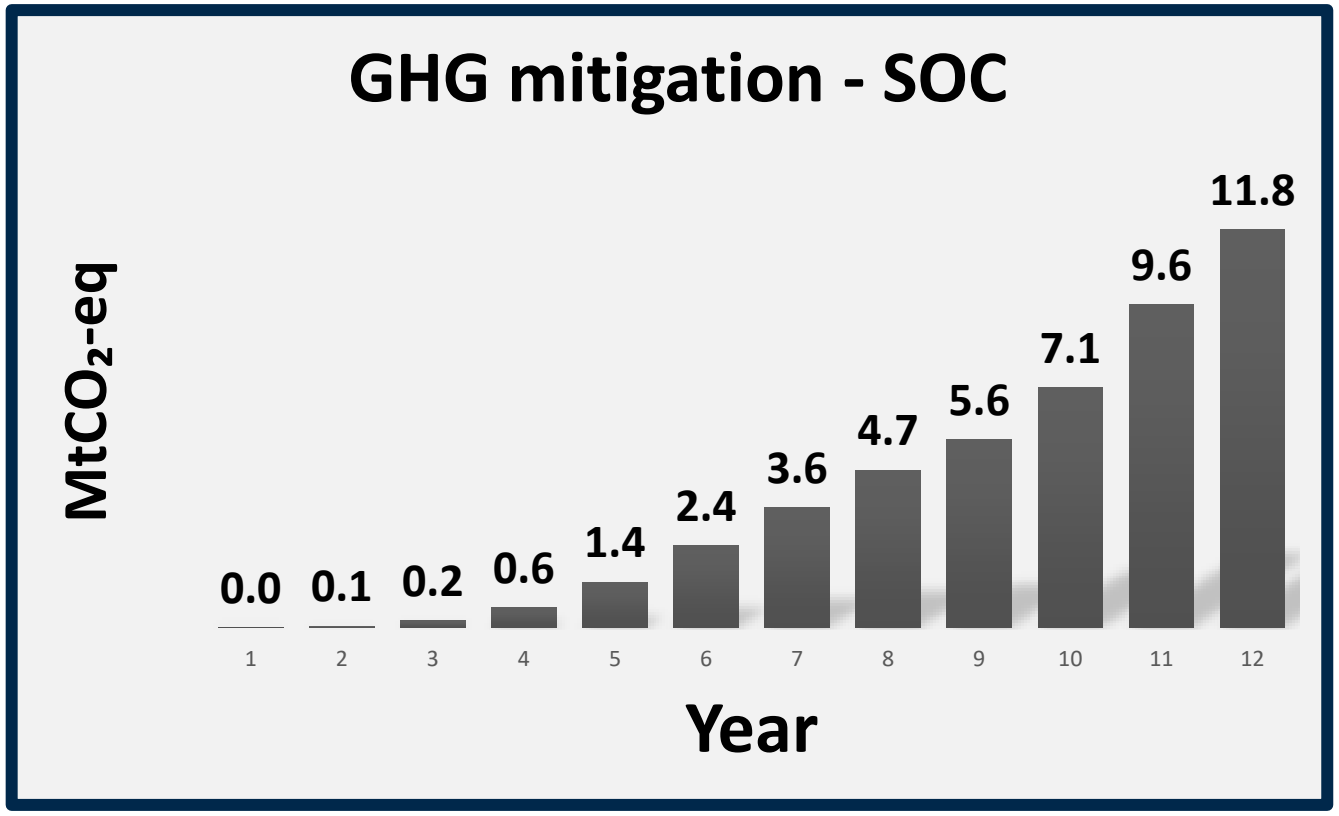


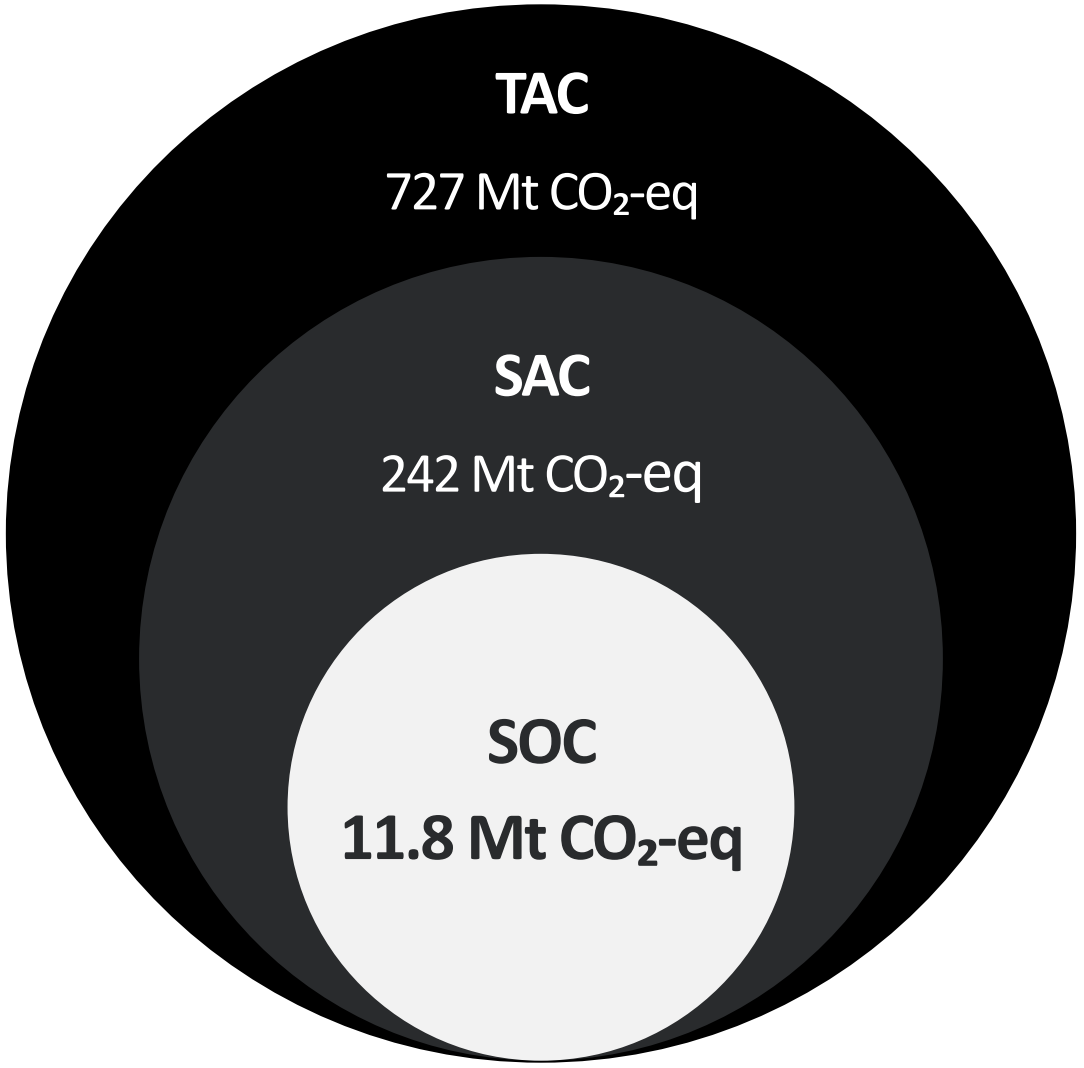
Heat Exchangers

Competition

	Hycomplate	HYCCO BIPOLAR PLATES	DANA
Durability	★★★☆	★★★☆	★☆☆☆
Weight	★★★☆	★★★☆	★☆☆☆
Mechanical properties	★★★☆	★★★☆	★★☆☆
Forming capabilities	★★☆☆	★★☆☆	★★★☆
Electrical conductivity	★★☆☆	★★★☆	★★★★
Thermal conductivity	★★★☆	★★☆☆	★★★★
Production rate	★★★☆	★★☆☆	★★★★
Price	★★★★	★★★☆	★★★☆

Climate Impact–Hycomplate





Serviceable Obtainable Carbon (2037):

11.8 Mt **1.2M BPP Sale Target (annually)**

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Thank you for your interest in Hycomplate!

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