cert

systems

Essential molecules without fossil fuels

DeepChecks submission

ROUND OVERVIEW

- CERT Systems (‘CERT’) is commercializing Direct CO_2 Electrolysis, a technology to convert carbon dioxide emissions into Sustainable Aviation Fuel (SAF) and other essential molecules

- CERT is raising a $3.5M USD Seed Round to accelerate commercialization
  - We have about **50% in soft-commits** from strategic investors, **seeking a lead**

- **Timing:** CERT will be announcing **new non-dilutive funding** from a commercial partner in late June 2026

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CERT SYSTEMS PROFILE

- **HQ**: Toronto, Ontario, Canada
- **Employees:** 12 full time, 4 interns
- **Prior Equity Funding Raised:** None – clean cap table
- **Prior Non-dilutive Funding Raised:** >$8M USD
- **Revenue: >$700 k** in non-recurring engineering revenue
- **Highlights:**
  - Finalist in $20M NRG COSIA Carbon XPRIZE
  - Received Breakthrough Energy Fellowship
  - Tencent CarbonX finalist

Breakthrough Energy
Fellows

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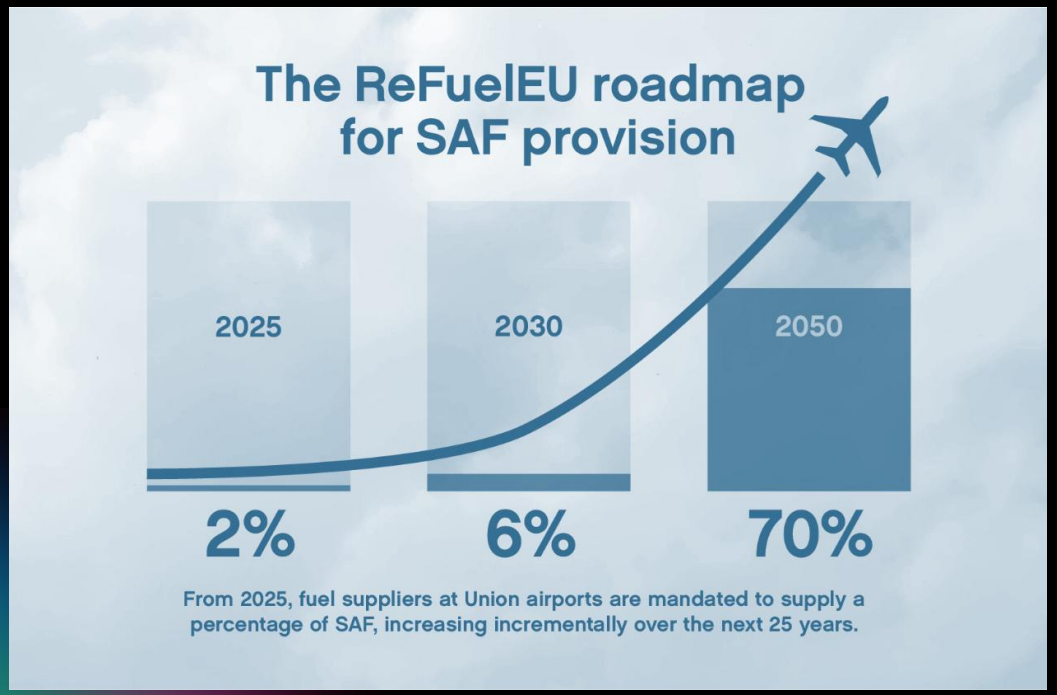
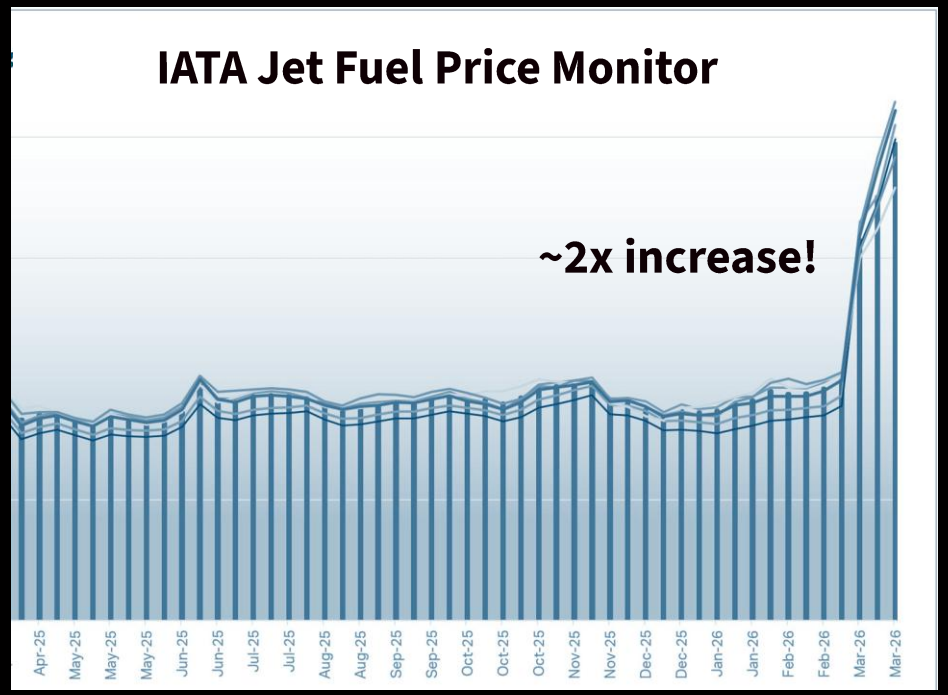
CLEAN FUELS MADE FROM AIR

THE WORLD NEEDS SUSTAINABLE FUELS

- Global policies are forcing airlines to find new sustainable aviation fuel (**SAF**) supply



- Fuel supply security is challenged by world events at an increasing rate



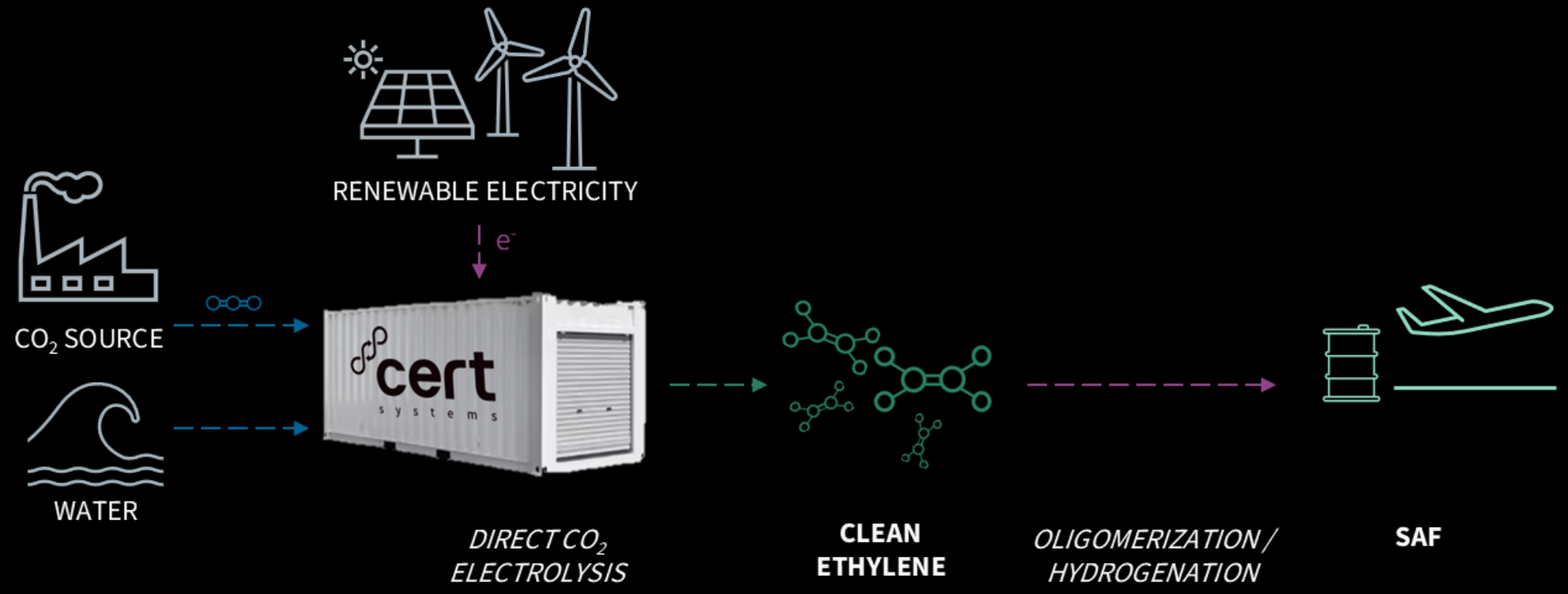
SAF PATHWAY COMPARISON

	HEFA	Alcohol to Jet (AtJ)	Power to Liquids (PtL)
Feedstock Availability	✗✗	✗	✓✓
GHG Reduction Potential	✓	✓	✓✓
Modularity	✓	✓	✗
SAF Yield / Selectivity	✗	✓	✗
Eligible for eSAF Credit	✗	✗	✓

SAF PATHWAY COMPARISON

	HEFA	Alcohol to Jet (AtJ)	Power to Liquids (PtL)	**Ethylene to Jet (EtJ)**
Feedstock Availability	✗✗	✗	✓✓	✓✓
GHG Reduction Potential	✓	✓	✓✓	✓✓✓
Modularity	✓	✓	✗	✓✓
SAF Yield / Selectivity	✗	✓	✗	✓
Eligible for eSAF Credit	✗	✗	✓	✓

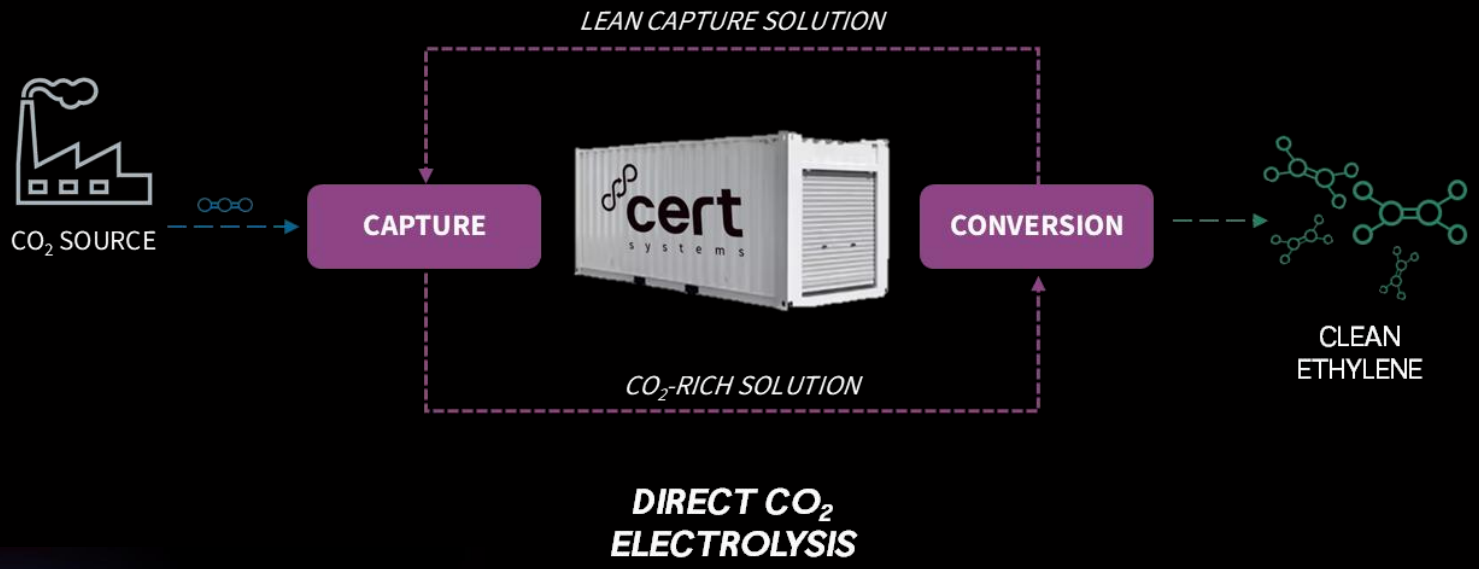
CERT PATHWAY : ETHYLENE – TO – JET



Modular technology with abundant feedstocks and selective pathway **reduces cost and complexity**

5 patents pending

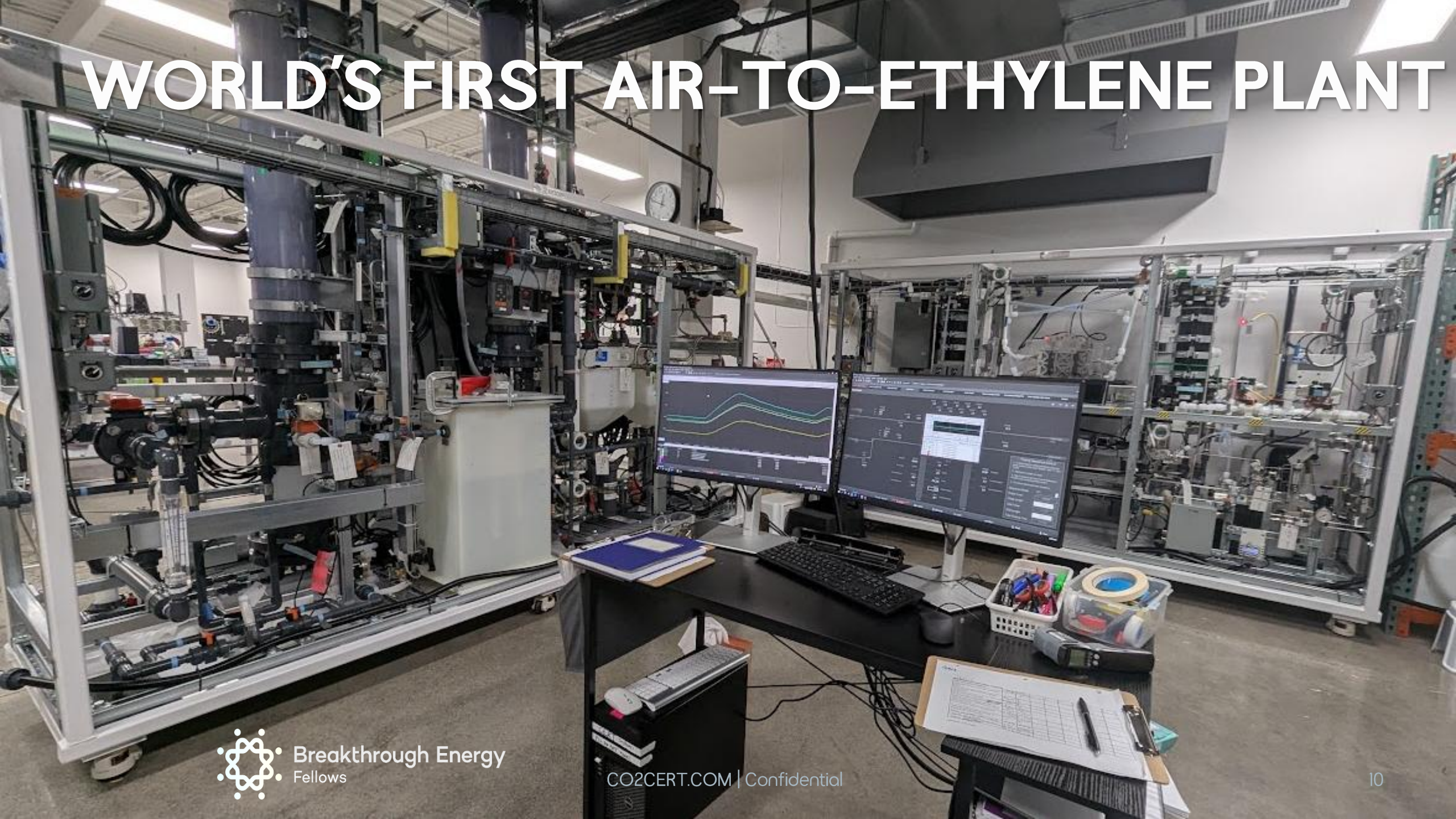
ENABLED BY DIRECT CO_2 ELECTROLYSIS



Advantages:

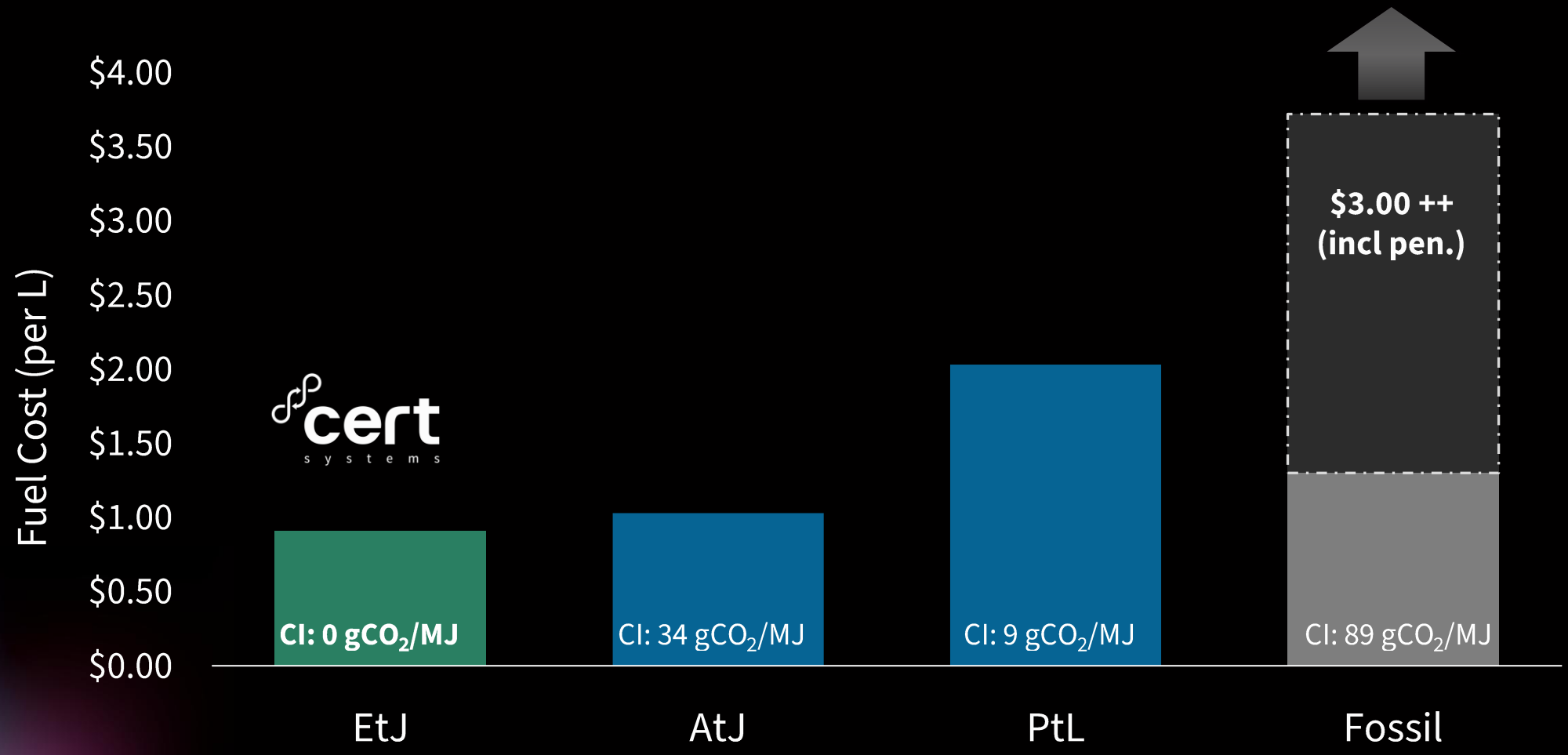
1. Any concentration of CO_2 feed
2. No H_2 or biomass input needed
3. Pure product streams of ethylene
4. Up to 5 t_{CO2} avoided per $t_{ethylene}$

WORLD'S FIRST AIR-TO-ETHYLENE PLANT



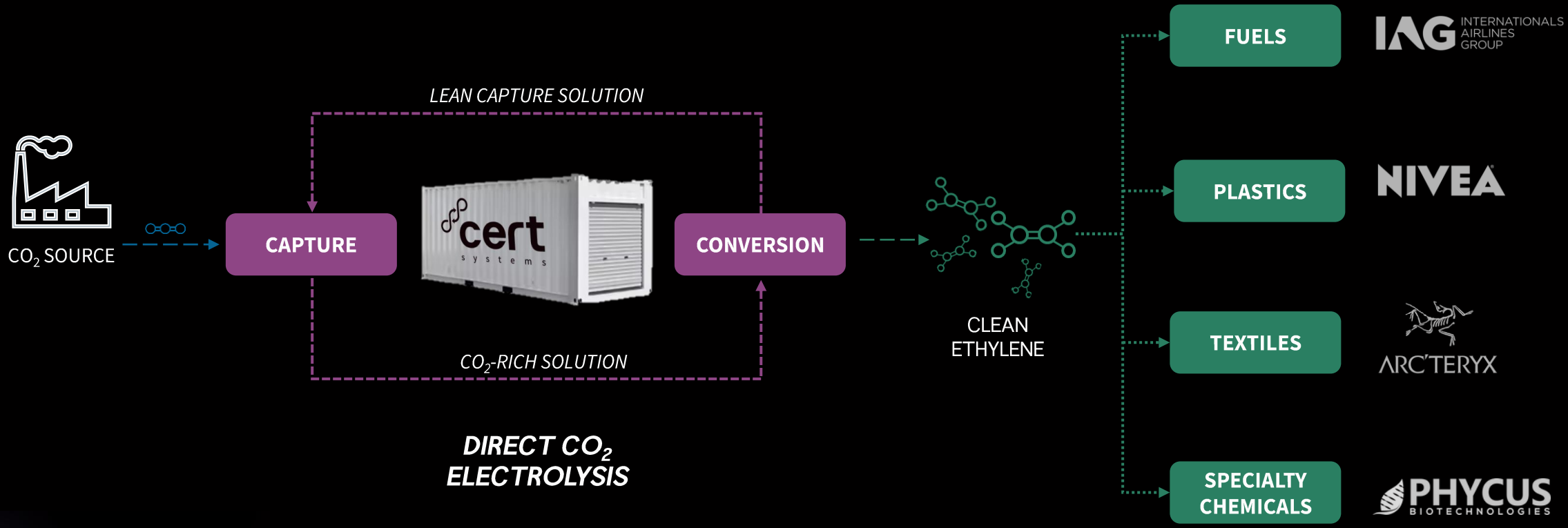
Breakthrough Energy Fellows

LOWEST COST & CARBON INTENSITY



Note: Using estimated 2050 EU penalty (Carbon Direct)
Future case for CO2-to-ethylene

A VERSATILE SOLUTION



Ethylene is the world's most used organic chemical – $200B/yr

* Representative brands

WORLD-CLASS TEAM

Alex Ip, PhD

Co-Founder & CEO

15 years in Cleantech
Grew teams for solar and carbon R&D
Established partnerships with global companies

Christine Gabardo, PhD

Co-Founder & CTO

Electrochemical expert
>50 peer-reviewed articles, >14k citations
Led XPRIZE team in finals

Breakthrough Energy Fellows

Carbon made

XPRIZE CARBON
nrg | cosia
FINALIST

ADVISORS

Prof. Dave Sinton
Chief Scientific Advisor
UNIVERSITY OF TORONTO

Jen Wagner
Business Advisor
CARBON CURE

Alice Havill
Scale-up Advisor
LanzaTech

Houston Brown
Fractional IP Director
ip

John Gartner
Operations Advisor
PLUG POWER

Susan Koch
Fractional CFO
Carbon Engineering

Joe Cargnelli
Electrolyzer Advisor
HYDROGENICS

MULTIDISCIPLINARY TEAM

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CERT'S JOURNEY & PATH FORWARD

UNIVERSITY OF TORONTO

XPRIZE CARBON nrg cosia FINALIST

1 of 10 finalists
Integrated gas phase electrolysis pilot (100 kg/day)

1V decrease, 33% FE increase

Paid proof of concept

AGC

3x increase capacity of system with no drop in EE

Paid proof of concept #2

CURRENT FUNDRAISE: Seeking $3.5M USD

Pilot Plant

Commercial Demonstration

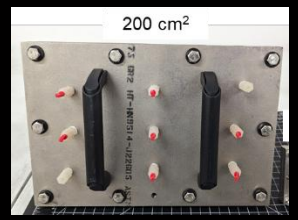
Commercial FOAK Plant

Nth of a Kind Plants

2020 2022 2024 2026 2028 2030 2032 2034

Breakthrough Energy Fellows

Philanthropic funding to develop and scale carbonate electrolysis



Scaling by >100x, EE improvement 6x

Integrated carbonate electrolysis pilot (1 kg/day)

Continued R&D & Innovation on Electrolyzers, Plants, and Products

OVER $8M USD OF FUNDING TO DATE

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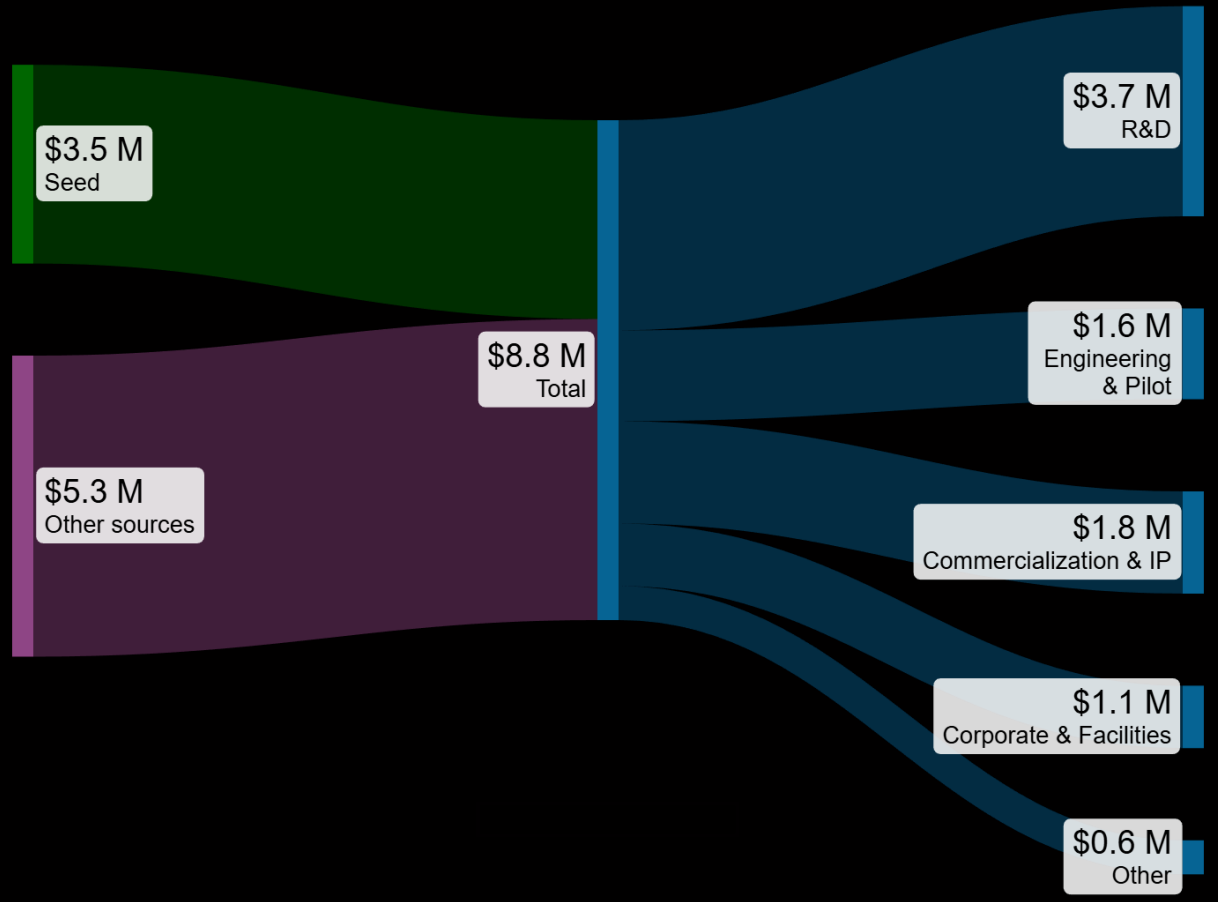
CERT INVESTMENT OPPORTUNITY

$3.5M USD Equity Round

Milestones

- **Build** tonne-scale pilot
- **Engineer** first commercial demo
- **Secure** initial offtake customers
- **File** key patents



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MARKET ROADMAP & TAILWINDS

COMMERCIAL ROADMAP

- **Phase 1: Pilot (Current Seed Raise):** We will build our 1 tpa pilot to generate samples and build partnerships with CPG brands for offtake of our materials.
- **Phase 2: Commercial Demonstration (Series A):** We will own and operate a commercial demonstration to provide sustainable materials for first off-takers. We will start in the personal-care sustainable packaging space to validate the scalability while building partnerships in fuels.
- **Phase 3: Commercial FOAK (Series B+):** Having validated the technology and market, we will partner with incumbent chemical producers to scale and deploy into SAF markets. We will license the technology and manufacture the core electrolyzer components.

CUSTOMERS AND REVENUE MODELS

Ethylene + SAF **(Technology Provider)**

UNITED · DELTA · Lufthansa · TECHNIP ENERGIES · LUMMUS TECHNOLOGY · Honeywell UOP

Ethylene **(Technology Provider)**

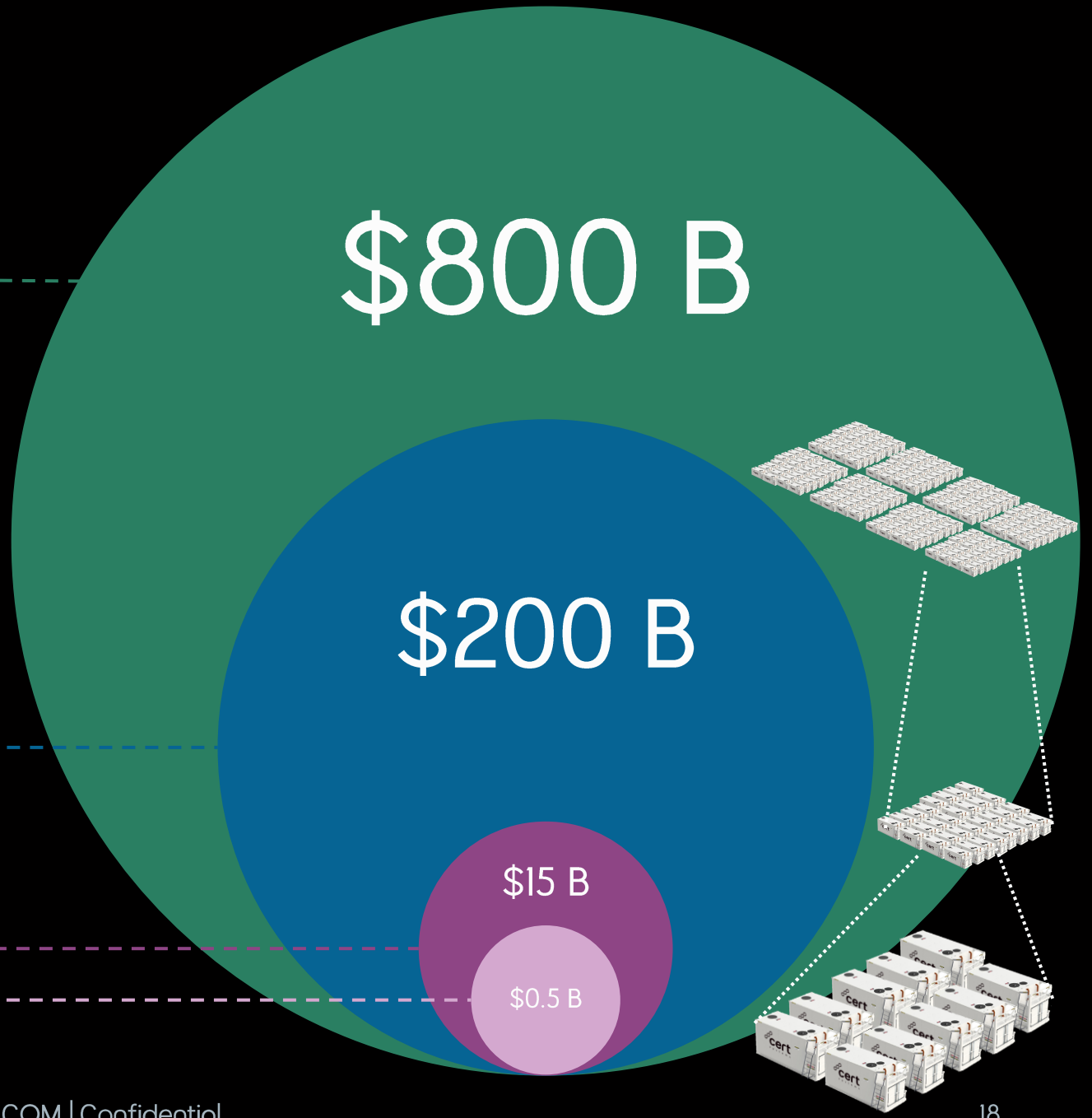
REPSOL · BASF We create chemistry · TotalEnergies · AGC

Sustainable Polyethylene **(Direct Sales, JV)**

Milliken · TOYOTA · amcor

Renewable HDPE packaging **(Direct Sales)**

NIVEA · DANONE · P&G



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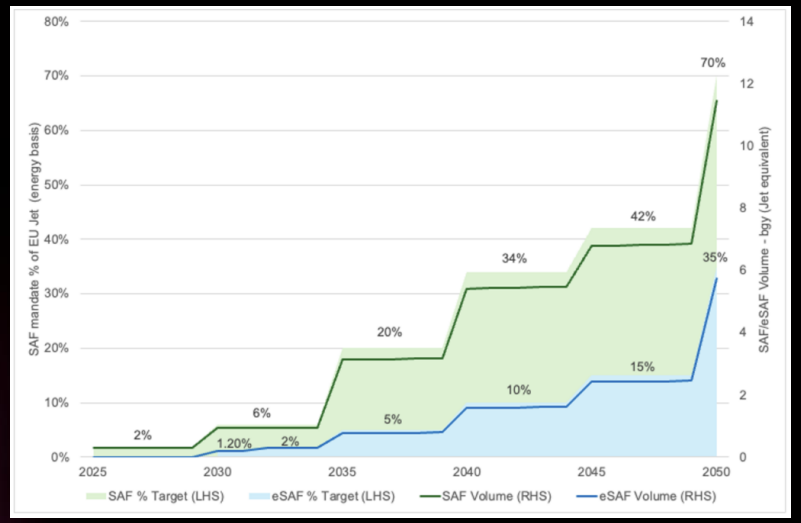
IMPORTANCE OF eSAF

- Biomass routes are highly dependent on feedstock to determine carbon intensity and scalability
- Fuels made from CO_2 and electricity are considered eSAF
  - EU and UK have mandates for eSAF as part of overall aviation fuel blend - starting in 2030 and reaching 35% of total fuel by 2050
  - Non-compliance leads to penalties 2-13x the price difference in eSAF and fossil jet



EU SAF (green) and eSAF (blue) mandates) [Stillwater Associates]

SAF POLICY PUSHING ADOPTION

Cost-comparison of compliance vs non-compliance (US$/gallon)

		United Kingdom		European Union	
Year	SAF type	Cost of compliance ($/gallon)	Cost of non-compliance ($/gallon)	Cost of compliance ($/gallon)	Cost of non-compliance ($/gallon)
2025	SAF	$4.42	$23.55	$4.42	$8.84 (+$4.42 next period)
	e-SAF	–	–	–	–
2030	SAF	$2.77	$23.55	$2.77	$5.54 (+$2.77 next period)
	e-SAF	$7.21	$24.92	$7.21	$14.42 (+$7.21 next period)
2040	SAF	$2.08	$23.55	$2.08	$4.16 (+$2.08 next period)
	e-SAF	$5.44	$24.92	$5.44	$10.88 (+$5.44 next period)
2050	SAF	$1.72	$23.55	$1.72	$3.44 (+$1.72 next period)
	e-SAF	$4.59	$24.92	$4.59	$9.18 (+$4.59 next period)

Carbon Direct

- Global policies require uptake of SAF
  - Penalties can far exceed the initial green premium
  - UK has implemented Revenue Certainty Mechanisms for SAF producers

DEFENCE AND ENERGY INDEPENDENCE

- CO_2 conversion enables localized production of fuels and materials
- Reduces reliance on long, international supply chains
- Ethylene-based molecules can easily drop-in to existing infrastructure

"Synthetic e-Fuels are the only scalable solution that match the energy density, storability, and versatility of conventional fuels – making them indispensable for modern defense readiness."
- Rheinmetall (defence manufacturer)

POLYETHYLENE: CORPORATE DECARBONIZATION MANDATES

INCREASING REGULATORY PRESSURE

"By 2030, **sustainable non-fossil sources** should cover at least **20% of the carbon use** for chemical and plastic products.

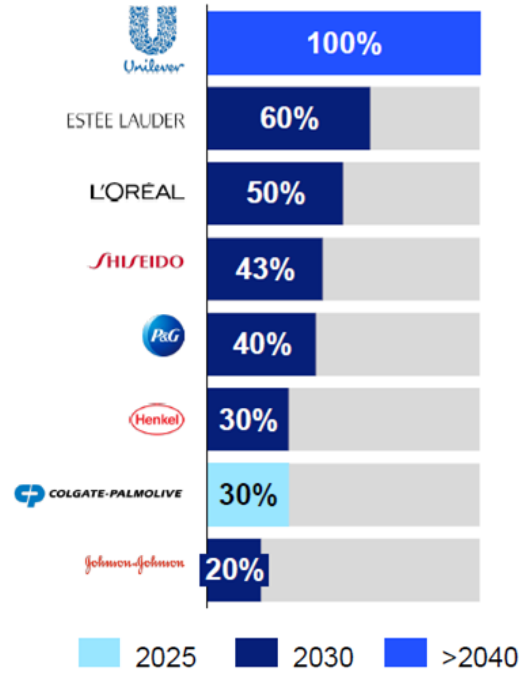
- European Parliament

European Parliament

INCREASING CONSUMER PRESSURE

Consumers seek 30-40% value chain CO_2 cuts by 2030

- McKinsey



JOIN OUR MISSION

To produce clean fuels made from air

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ALEX@CO2CERT.COM