

MEMBER MEETUP



[October 1st, 2025](#)

Agenda



1. Bagels & Coffee
2. Intros
3. Keeping up with ID
4. Upcoming Events & Offerings for Members
5. **ID Member Spotlight:** Hamed Heidari from C+UP
6. **ID Member Resource:** Joshua O'Shea from Glen Ellyn Public Library

Keeping up with ID:



- **Welcome to our new Clean Energy Program Manger, Ricardo Magallon!**
- **Member Portal is available for your use!**
- **Room Booking is available through the portal**
- **Midwest Innovation and Entrepreneurship Summit: Moved to February 26, 2026**
- **Clean Energy Incubator Program:**
 - **Fill out the Connect Form**
 - **Connect with Bill Payne and Mike Varon**

Scan the QR code to keep up with the news:



YOUR MONEY MATTERS

WITH JON HANSEN



**TUESDAY
OCTOBER 21ST, 2025
6:30PM**



Tune in to WGN Radio 720 AM on October 21st, 2025 at 6:30pm, for Your Money Matters with Jon Hansen. **Innovation DuPage's** Managing Director, Dan Facchini, MS, CFRE, and **City Tree Delivery's** Chris Hohenstein, **People of Play's** Mary Couzin, and **Gray Matter Games's** Joe Barron , will be on air. Join them for an engaging discussion about the upcoming Toy and Game fair as well as making your holidays effortless with City Tree Delivery.

FEATURING:



Upcoming Workshop:



Top 10 Tax Strategies for Entrepreneurs



Presenter: Sean O'Connell

- Maximize deductions & depreciation
- Simplify accounting & mileage tracking
- Plan smarter with retirement & §529 options
- Navigate sales, marketing & QBI strategies

Wednesday, October 22, 2025

🕒 5:30 - 7 p.m.

📍 535 Duane St. Glen Ellyn, IL 60137

 **SIKICH.**

Register Today!



Upcoming Workshop:



Event Name:

Expand Your Business Globally: Illinois Export Roadshow 2025

Date, Time, and Location:

Tuesday, October 28th, 2025

10:00 AM to 12:00 Noon

Business Development Center (Civic Center)

535 Duane Street, Training Room 301

Glen Ellyn, IL 60137

Register Today!



Member Offerings:

NaperLaunch Academy

Growing a Business

During this four-week series, attendees will:

- Learn how to write a business and strategic marketing plan
- Explore library resources for entrepreneurs
- Master six key professional sales skills

 **NAPERVILLE**
PUBLIC LIBRARY

**OCT
22
2025**

6:30 - 8:30pm



Nichols Library

Register Today!



Resources and Workshops



Additional Resources



Strategic Business Advisor

Mike Varon
Innovation DuPage



Strategic Technology Advisor

Justin Mayer
Innovation DuPage



Executive-in-Residence

Bill Payne
Innovation DuPage



MEMBER MEETUP



ID Member Spotlight:

C+UP

Hamed Heidari



Skip H₂. Start at C3

The Future of Fuels & Chemicals: Carbon-Negative Propane.

The World's First Scalable ePropane Platform

Hamed Heidari, PhD - Founder & CEO

Q4 2025

ILLINOIS TECH
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ENERGY

ARPAE™



RESURGENCE
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**INNOVATION
DUPAGE**

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The Problem



Industrial CO₂ emission abatements are permitting heavy, expensive, slow.



Clean fuels are produced in limited quantities via multi-step, and costly processes and required need new infrastructure and logistics.



Renewable electricity, low cost and stranded but lacks long duration energy storage, grid availability and portability

Our Solution

Single-step electrochemical process

CO_2 + water + renewable electricity → propane

CO₂-rich emissions

Biogenic /
Industrial

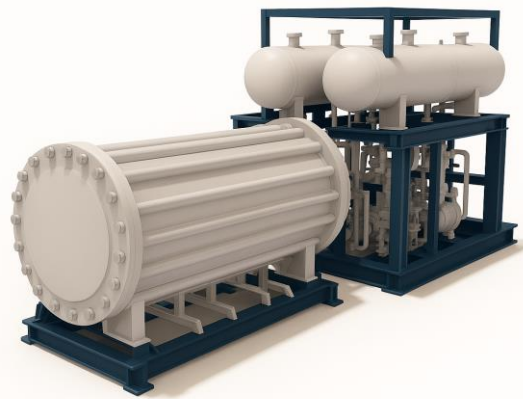
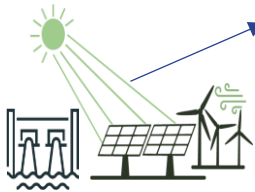


Water



Electricity

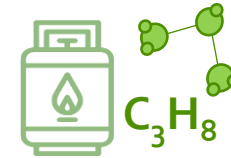
Renewable
/ Curtailed



C+UP Electrolyzer
5MW modular design

Propane (lpg)

Drop in for fuel,
SAF, chemicals



Oxygen

No H₂ input

No new infra/ or pressure req.

Works on CO₂-rich emissions
(fermentation off-gas, flue gas).

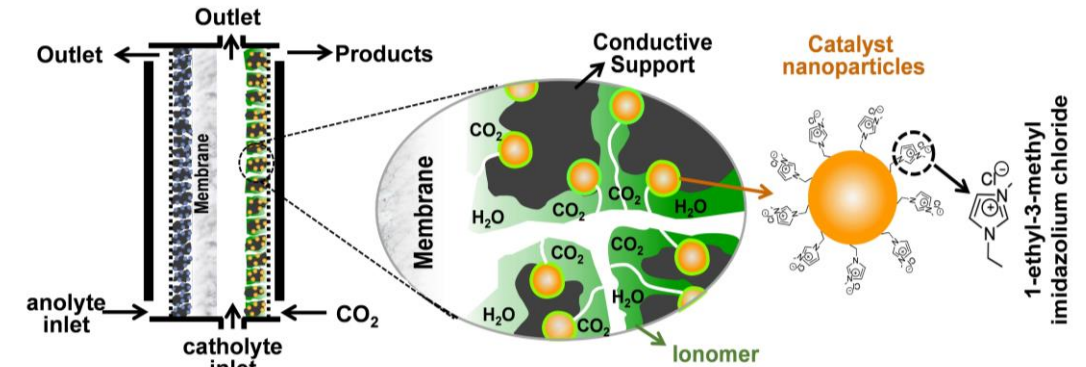
Energy-dense, drop-in molecule
fuel, SAF feedstock, polymers.

Store stranded/curtailed
renewables as liquid energy.

Modular, scalable, infra-ready.

Scientific Breakthrough

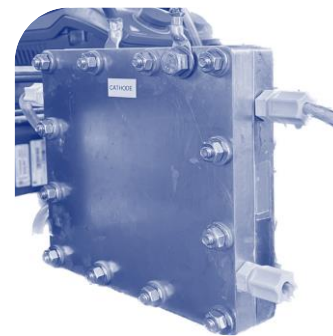
- 90% selectivity for propane
- 50% single-pass carbon efficiency
- <2.4 V operating voltage
- 200+ h of continuous operation (<5% decay)
- Minimal carbonate formation (<5%)
- No external hydrogen required



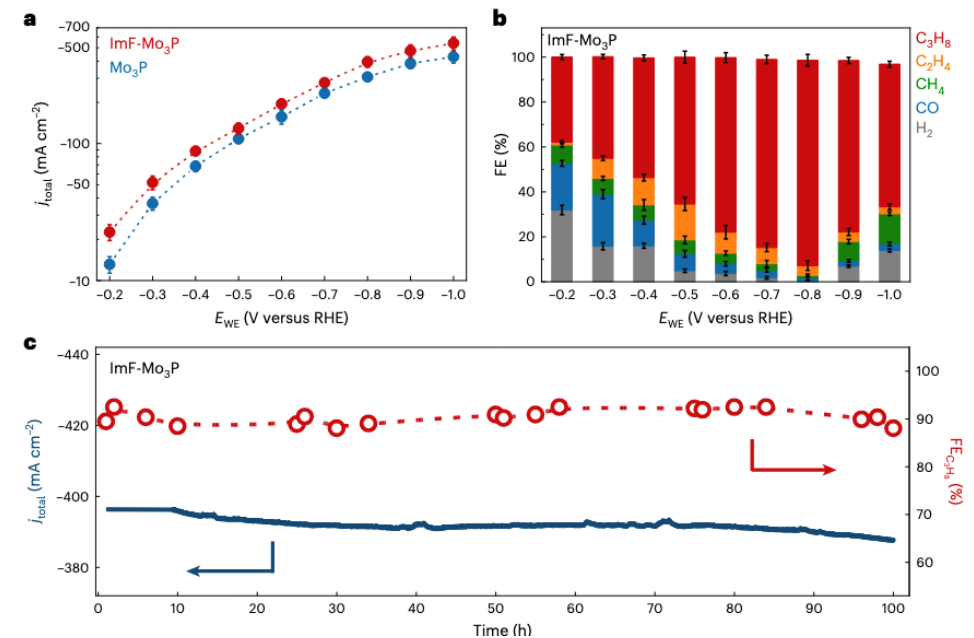
nature energy

Article
<https://doi.org/10.1038/s41560-023-01314-8>
Imidazolium-functionalized Mo₃P nanoparticles with an ionomer coating for electrocatalytic reduction of CO₂ to propane

<https://tinyurl.com/4bcztm5m>



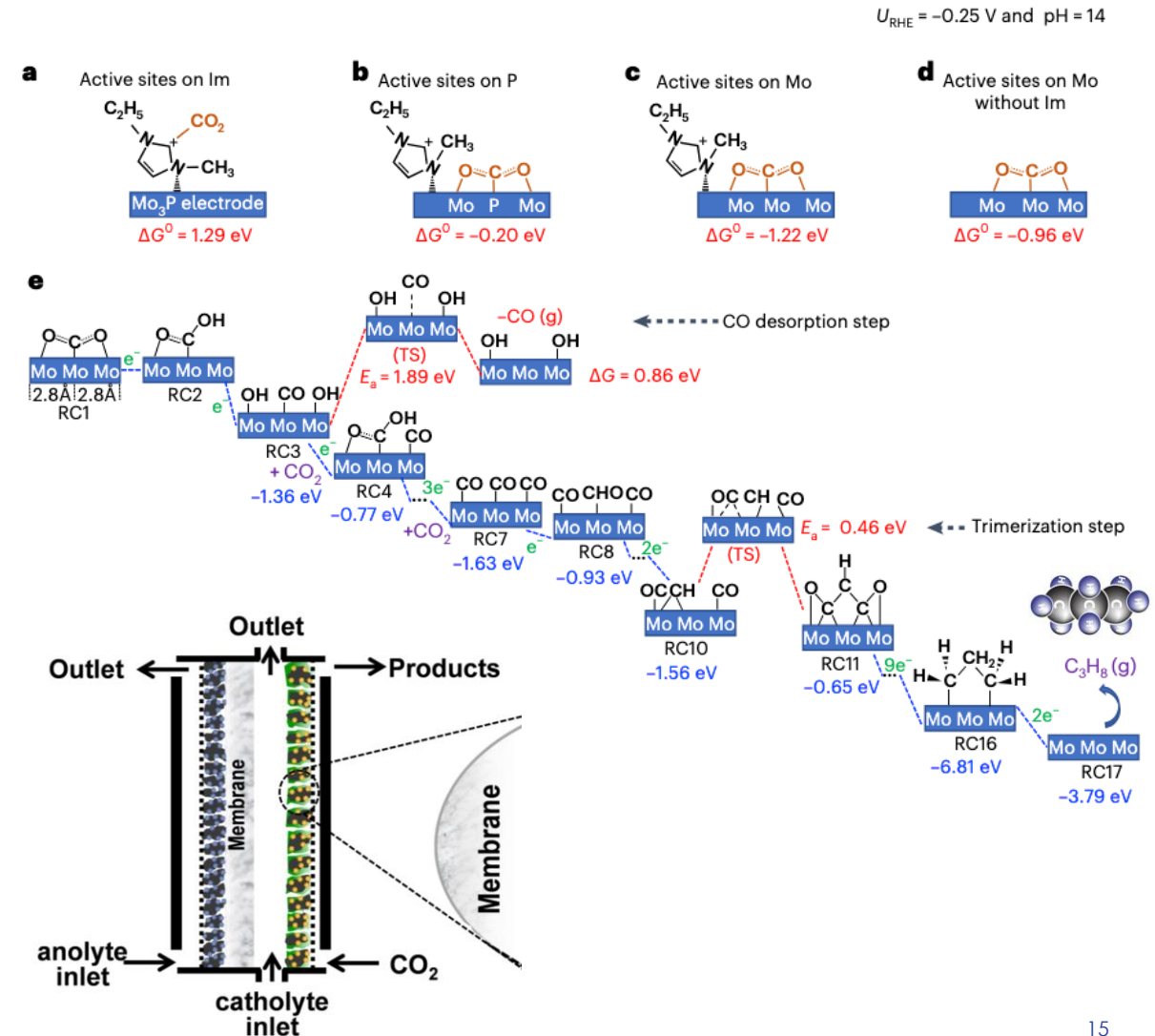
Bench scale 100W prototype (4x4")
 ✓ TRL4 achieved



System Architecture

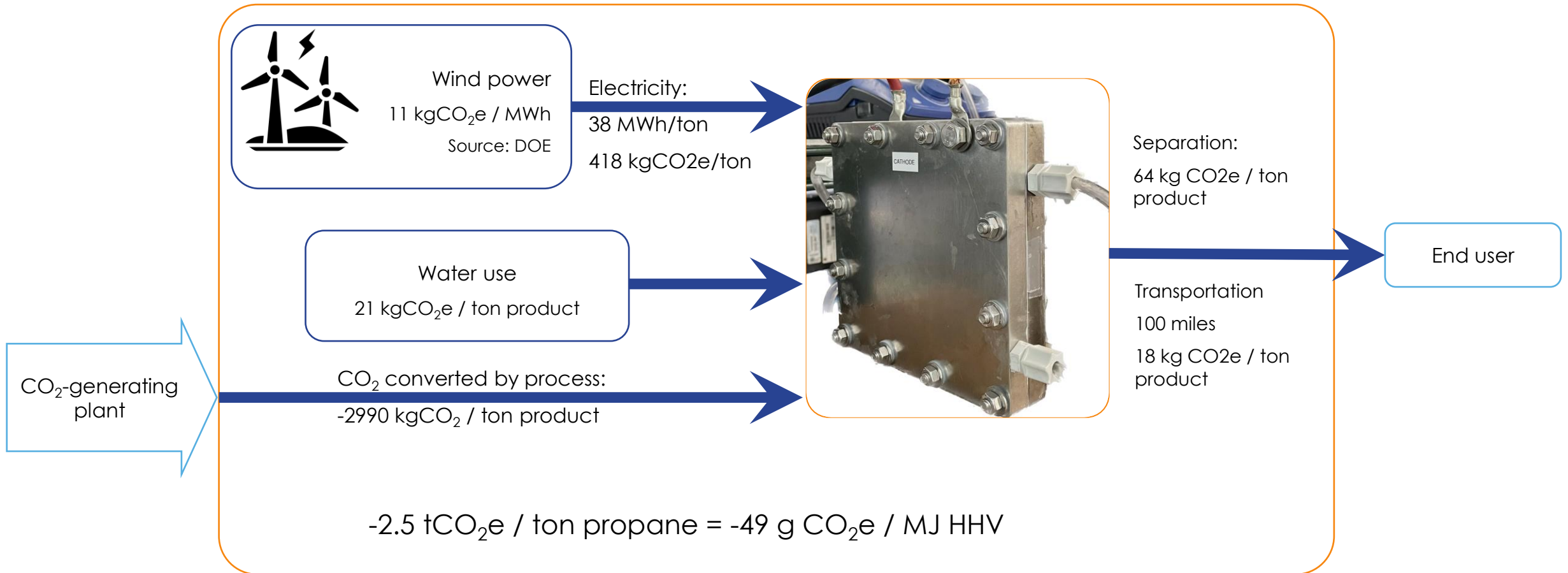
Modular, scalable zero-gap electrolyzer:

- CO_2 enters cathode side;
- Water feeds the anode
- On-demand H_2 generated in situ
- TM-Im catalyst boosts CO_2 adsorption and conversion
- Stack design minimizes energy losses



LCA Flow chart (cradle-to-market)

System boundary



At scale >1M t CO₂ offset = 250,000 cars removed annually

How We Compare

Technology	Feedstock	Output Molecule	Infra Compatibility	TRL	Efficiency
C+UP	CO ₂ + water + electricity	Propane	Full drop-in	4–5	50–63%
Bio-propane	Fats & oils	Propane	Full drop-in	7–8	Low–Medium
FT synthesis	Biomass → Syngas	Mixed fuels	Partial	7	Medium
Green hydrogen	Water + electricity	H ₂	Not compatible	7	Medium
H2-based eFuels Twelve / Infinium..	CO ₂ + water + electricity	Mixed fuels	Partial	7-8	Medium

Scalable, distributed, and practical—propane for every market.

Why Propane (C₃)



Energy-dense, storable,
transportable fuel



Drop-in alternative fuel for diesel
(No Nox, and particulate materials
emission resulting in cleaner air)



Clear advantage vs. hydrogen
(storage, infrastructure, efficiency)

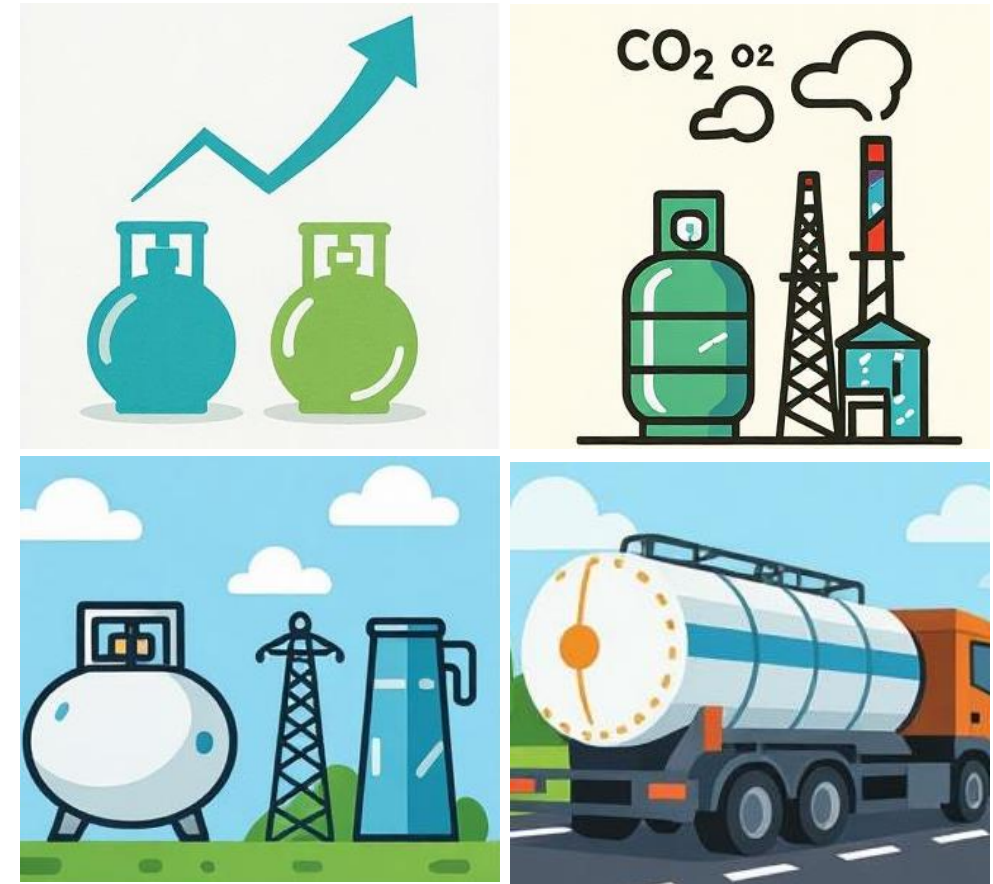


Premium feedstock SAF, green
polypropylene, chemicals

Fuel and feedstock of choice all across the board

Why clean propane matters?

- Propane demand is rising, but current renewable supply is limited and expensive.
- CO₂ is an abundant, biogenic, and undervalued feedstock—especially from ethanol and steel.
- Our process produces clean propane using electricity and water—no bio feedstock required.
- Fits within your existing tanks, trucks, and pipelines—no infrastructure change needed.



Use Cases for Propane Stakeholders

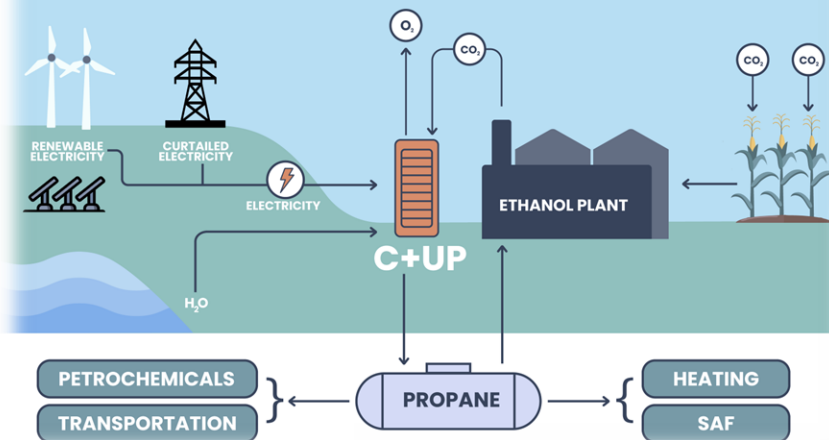
- **Ethanol producers**
Convert fermentation CO₂ into e-propane for on-site fuel or sales
- **LPG distributors**
Add e-propane to portfolio without infrastructure changes
- **Off-grid and rural communities**
Generate propane locally from solar + CO₂
- **Petrochemical/SAF players**
Clean C₃ feedstock for polymers and sustainable aviation fuel



Beachhead: Biogenic CO₂ from Ethanol & Liquor Producers

Why Start Here?

-  **Pure, Biogenic CO₂** — no capture cost
-  **On-site/nearby Renewables**
 - solar, wind, waste heat
-  **Propane Reuse or Sales**
 - fuel, heating, SAF feedstock
-  **Easier Permitting & Incentives**
 - e.g. 45Q, 45Z, LCFS, RINs
-  **Circular Carbon Model**
 - waste-to-value, on-site use



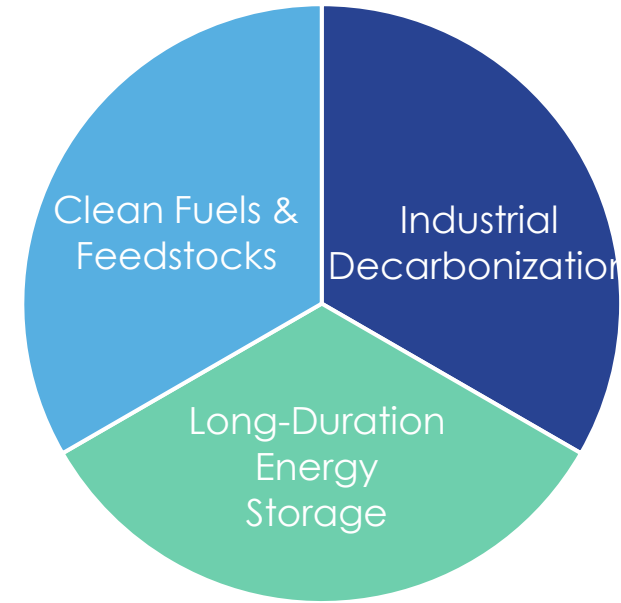
190+ Ethanol plants
emit **50M+** tons of CO₂/year = emissions ~ of **10M** cars

Climate, Market & Economics

\$150B+

\$50B+ propane market;
\$100B+ clean fuels & petrochemicals.

- 5 MW module: 41% IRR, 3-year payback
 - Cost: \$1,200/t at 5 MW vs \$1,800/t retail propane,
 - 3600 t/y CO₂ to 1,200 t/year of propane,
 - Equal to storing ~17 GWh of renewable power



Deployment Roadmap

2026

- 2kW pilot system (Brown-Forman site)
- 500+ hours targeted stability



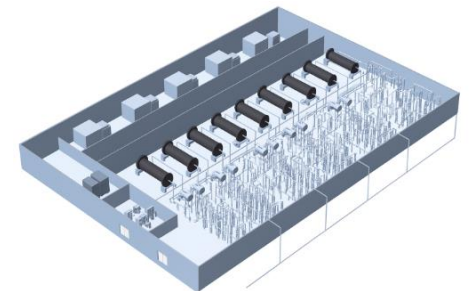
2027–2028

- 20kW demo units hosted by ethanol producers and off-grid users
- Data collection for commercialization



2029+

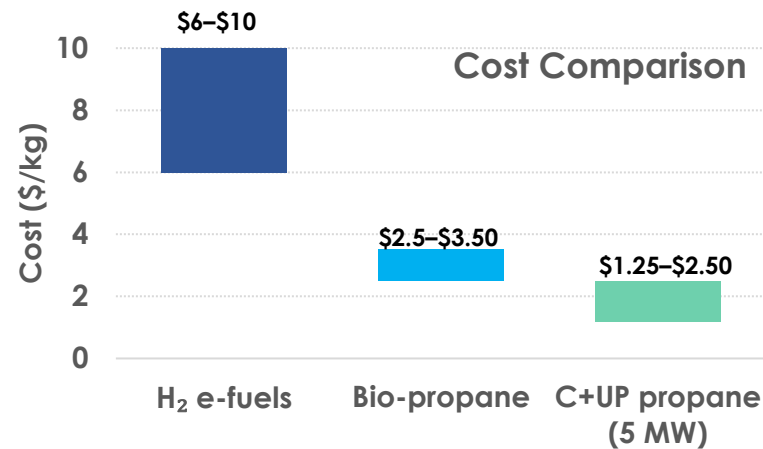
- 5MW modular deployments
- Co-located systems at CO₂ emitters and renewable hubs
- Strategic licensing, fuel partnerships, and SAF integration



Profitable Propane at Plant Gate

LCOX comparison: C+UP: \$1.25–\$2.50/kg

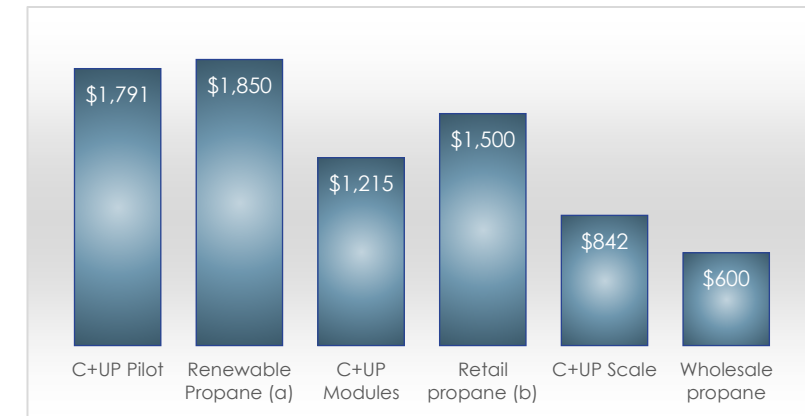
vs H_2 fuels: \$6–10/kg and bio-propane: \$2.50–3.50/kg.



Stacked incentives: Up to \$290-400+/t CO₂
(\$500-1000/t propane)

Incentives as additional revenue: 45Q (\$85/t), 45Z (\$180/t), PWA (5X), LCFS, DOE & USDA programs ^c

	Unit	Pilot (20kW)	Module (5MW)	Scale (150MW)
Propane cost	\$/mt	1,791	1,200	842
Production capacity	t/y gal/y	6 3,000	1,225 640,000	35,000 18,260,000
CO ₂ input	t/y	18	3,600	105,000
Electricity cost	\$/MWh	40	30	25



a. Bio Propane Price: [S&P Global 2024](#)

b. Retail/Wholesale: [US EIA Weekly Propane Wholesale/Resale Price 2024](#)

c. Carbon Credit valuation: [BloombergNEF Global Carbon Market Outlook 2024](#)

Business Model: Capturing Value Across the Carbon-to-Propane Ecosystem

Revenue Streams



System Sales / Licensing

Modular electrochemical systems to CO₂ emitters



Propane Sales / Offtake Royalties

Revenue share from fuel sale via Suburban, AmeriGas



Carbon Credits

LCFS, 45Q, RINs (especially with biogenic CO₂)



Service / Maintenance Contracts

(esp. if C+UP retains ownership)



Technology Licensing / White-labeling

for other verticals (chemicals, SAF)

Key Stakeholders & Benefits

Industrial CO₂ Emitters

Reduce Scope 1, reuse propane, get revenue

Renewable electricity producers

Grid dependency, Storage by converting electrons into liquid fuel

Propane Distributors

Get renewable propane with no infra change

Regulators & Governments

Achieve decarbonization targets

C+UP

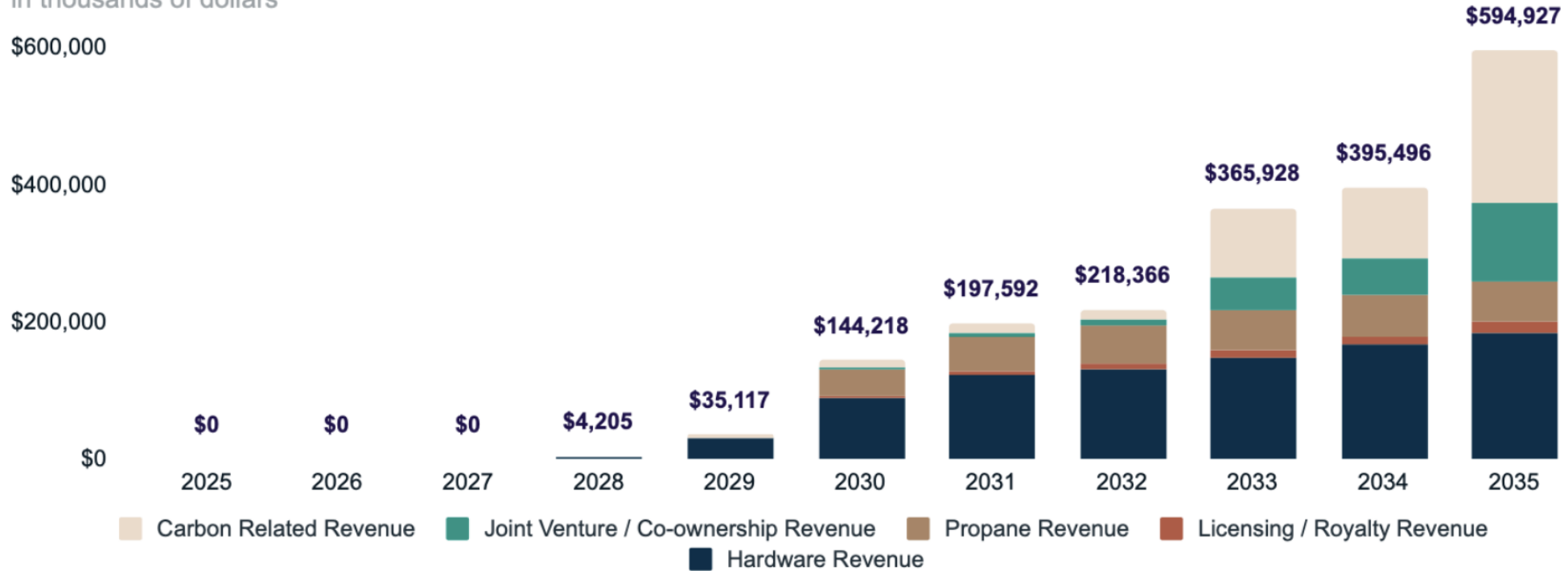
Monetizes IP, earns recurring revenue, builds market moat

Revenue and Profitability

Graph Timeline Until Year : 2035F ▼

Segment Wise Projected Revenue

in thousands of dollars



Traction

- \$5.6M DOE ARPA-E funding at Illinois Tech
- Pending other DOE & NSF funding
- Pilots: Brown-Forman distillery (100 W → 2 kW → 20 kW)
- Partnerships: AmeriGas, Suburban, BP, LanzaJet, Johnson Matthey, ArcelorMittal
- Offtake & Distribution: Suburban Propane, AmeriGas, PERC
- Scaling Up: Johnson Matthey, Naviscale (Halliburton Labs), Chart Industries, Czero, BP
- Policy & Incentives: PERC, WLGA, IL DCEO, USDA, DOE
- Recognition: Rice Alliance, Evergreen, Chicago Innovation, Innovation DuPage, etc.



Impact Metrics

◆ Climate Impact

- 3 t CO₂ in → 1 t Propane out → 2.5 t CO₂e avoided (net LCA)
- 5 MW module: 3,000 t CO₂e avoided/yr

◆ Health Benefits

- Propane emits **~25% less CO₂** than diesel.
- No NO_x, SO_x, and particulates → cleaner air, reduced asthma & heart disease risk.

◆ Jobs & Economy

- Local jobs created .
- Preserves existing industries.
- Expands workforce development

◆ Energy Resilience

- Storable & transportable clean fuel.
- Backup power & heating for schools, hospitals, transit fleets.
- Strengthens community resilience in outages & extreme weather.

our goal is to deliver **clean air, affordable energy, and good jobs** to communities most impacted by pollution and climate change.

Traction & Team



Hamed Heidari, Ph.D.
Co-founder & CEO

Led \$300M+ B2B sales,
Industrial projects,
energy transition, deep
customer networks



Prof. Mohammad Asadi
Co-founder & CSO

Pioneered CO₂-to-
propane chemistry.
12 patents, 4,000+
citations



Majid Roohafza, P.E.
Engineering Lead

20+ years in O&G and
green H₂ project
design, development
and delivery

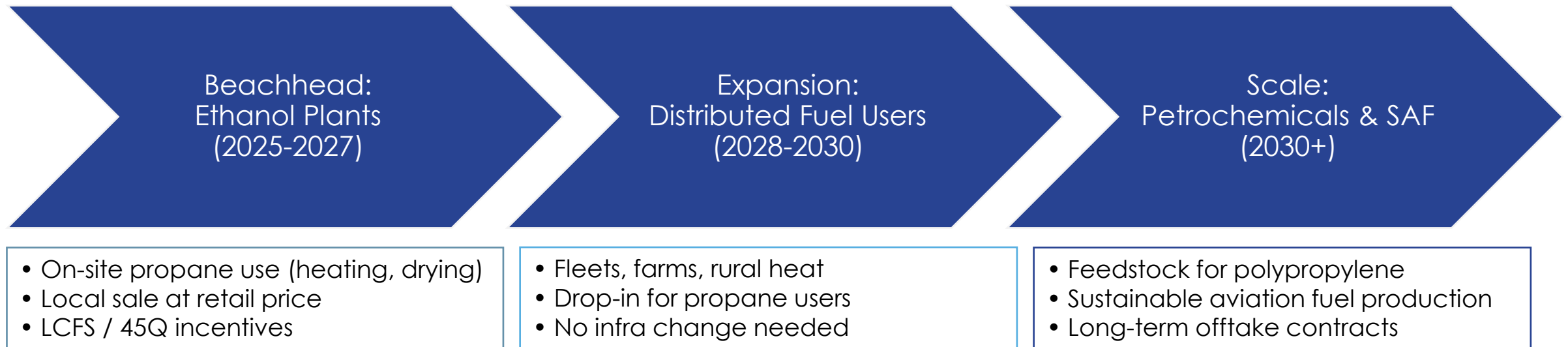
Advisors:

Jack Lewnard, Ph.D.
Strategy Advisor

Franz Nowak, MBA
Scaleup Advisor

Deep industrial execution (O&G, electrochemistry, scale-up)

Go-to-Market Strategy



Fundraising

Seed Round (1st tranche):

- De-risk pilot design and execution plan
- Secure pilot customers & site agreements
- Prepare full Seed round package
- Begin long-lead stack engineering

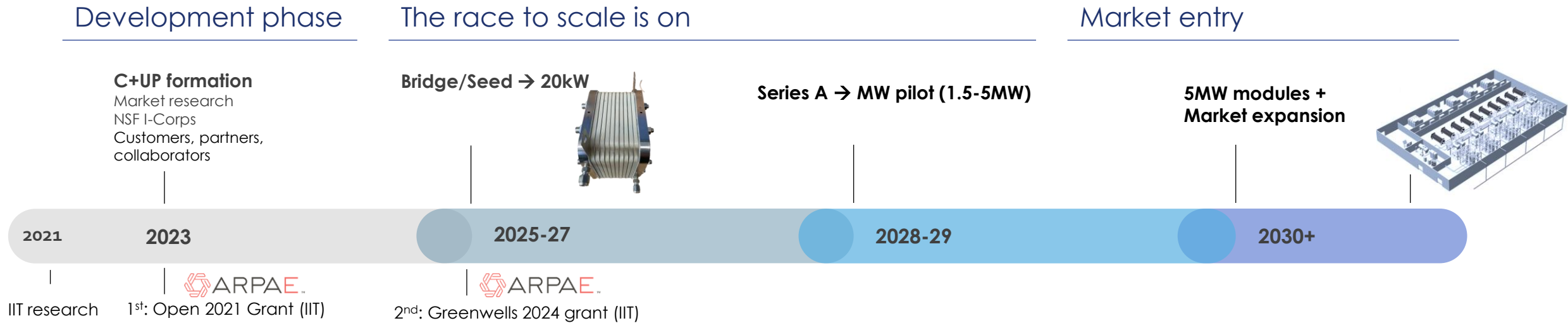
Seed Round (next tranche):

- Build & deploy 20 kW pilot system (TRL5–6)
- Generate operating data and customer validation
- Advance offtake & distributor partnerships

Series A (later):

- Scale to **1.5–5 MW** modules
- Deliver commercial FOAK with industrial customers

Scaleup Roadmap



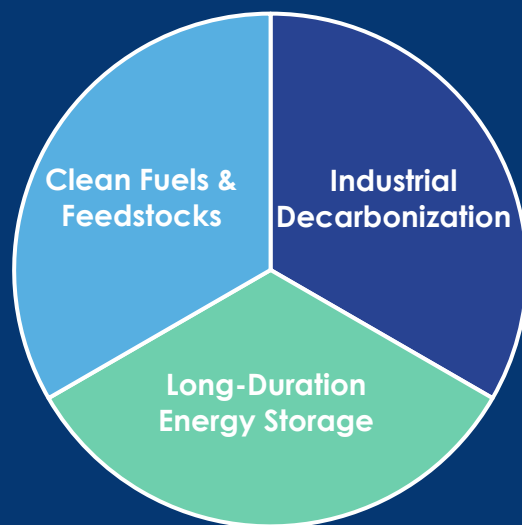
Let's Build the Clean Future

We are seeking partners to help us:

- **Rais seed fund**
- **Secure first customer sites:**
Identify and co-develop pilots with ethanol producers, distributors, or off-grid users.
- **Validate the market:**
Confirm demand, use cases, and economic drivers for renewable propane.
- **Refine market entry strategy:**
Define priority regions and customer segments for deployment.
- **Co-develop the business model:**
Work with propane leaders to refine value creation and pricing.
- **Build early momentum:**
Position together as the leaders in renewable LPG transition.



Delivering energy security through clean, renewable propane.



- Expand access to affordable, renewable LPG globally
- Provide clean energy security for households, industry, and transport
- Accelerate the transition to a sustainable, circular carbon economy

MEMBER MEETUP



ID Member Resource:

Glen Ellyn Public Library
Joshua O'Shea

<https://gepl.org>



Catch the next Meetup on 10/15/2025

Collaborate • Scale • Succeed



INNOVATION
DUPAGE