



DIVI
GAS

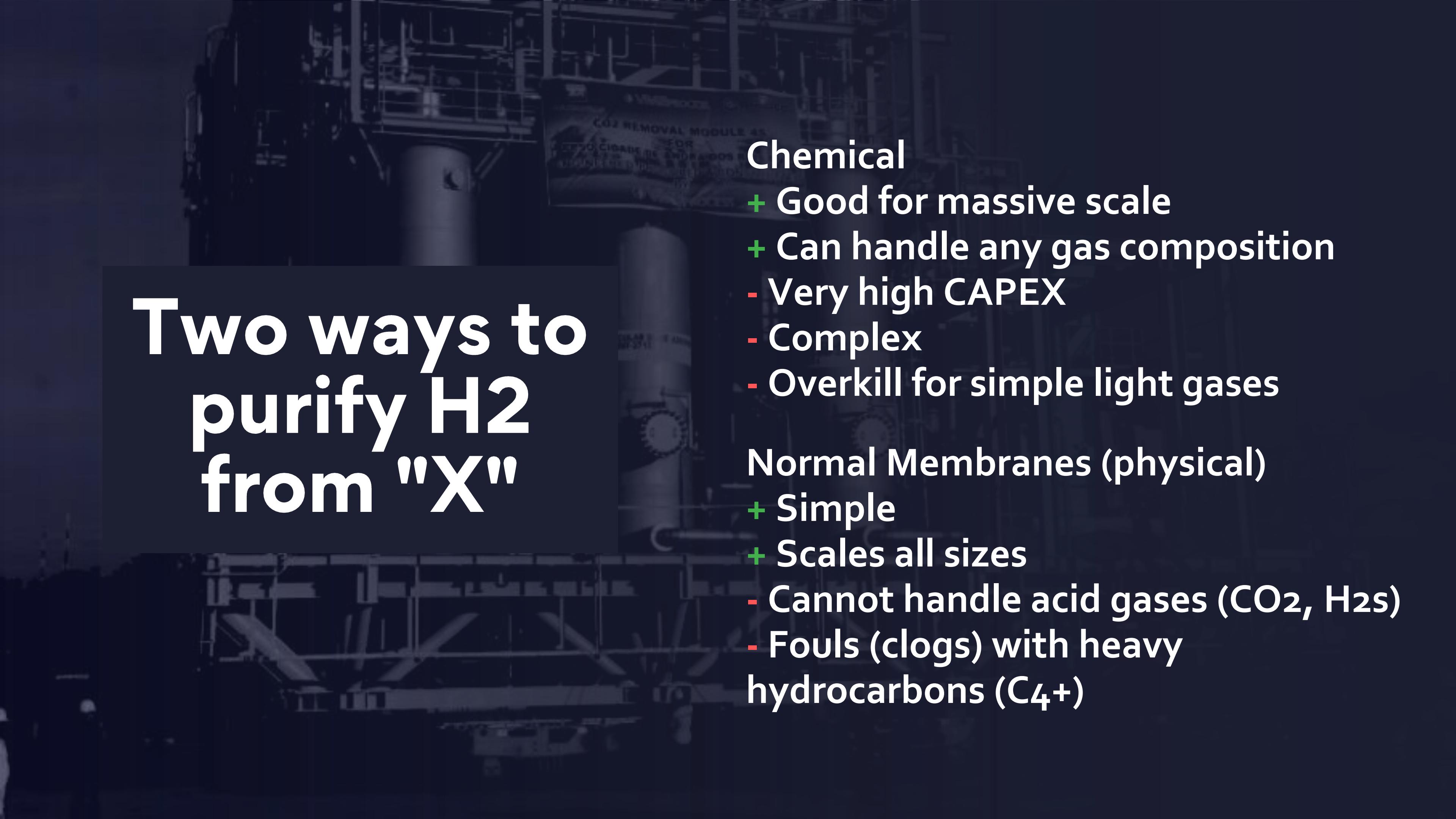


**H₂ always
needs to be
purified before
use or re-use**

**\$110b of H₂
made/yr**

in plants making
gasoline fertilizer chemicals





Two ways to purify H₂ from "X"

Chemical

- + Good for massive scale
- + Can handle any gas composition
- Very high CAPEX
- Complex
- Overkill for simple light gases

Normal Membranes (physical)

- + Simple
- + Scales all sizes
- Cannot handle acid gases (CO₂, H₂s)
- Fouls (clogs) with heavy hydrocarbons (C₄+)

These shortcomings cause problems all over the H₂ value chain

- Carbon Capture (CCUS) at H₂ plants too expensive for almost a Gigaton of CO₂ (Blue H₂)
- Biomass Gasification limited in feasibility (Green H₂)
- Average refineries 'leaks' \$6m per year in H₂ (Grey H₂)
- Many other next-gen hydrogen projects have a bottleneck at separations as well



Enter Divigas

A proprietary new hollow fiber polymeric membrane that has resistant properties far beyond what is currently on the market at an affordable price



DIVI
GAS





Like a standard membrane - The fibers are fitted inside 'module' systems.

Compared to existing systems,
DiviGas:

Resist
Acids



Good for
 H_2S , CO_2 ,
and tested
on extreme
acids

Resist
Heat



Up to 150°C,
which
prevents
Fouling by
 C_4^+

Unique
Pressure



High Max
operating
pressure +
high delta
pressure

Great
Value



Very high
selectivity,
Permaence

Solved

Key Differentiator

- Carbon Capture (CCUS) at H₂ plants too expensive for almost a Gigaton of CO₂ (Blue H₂)



- Biomass Gasification limited in feasibility (Green H₂)



- Average refineries 'leaks' \$6m per year in H₂ (Grey H₂)



- Many other next-gen hydrogen projects have a bottleneck at separations as well



Resist
Acid

Resist
Heat

Unique
Pressure

Great
Value

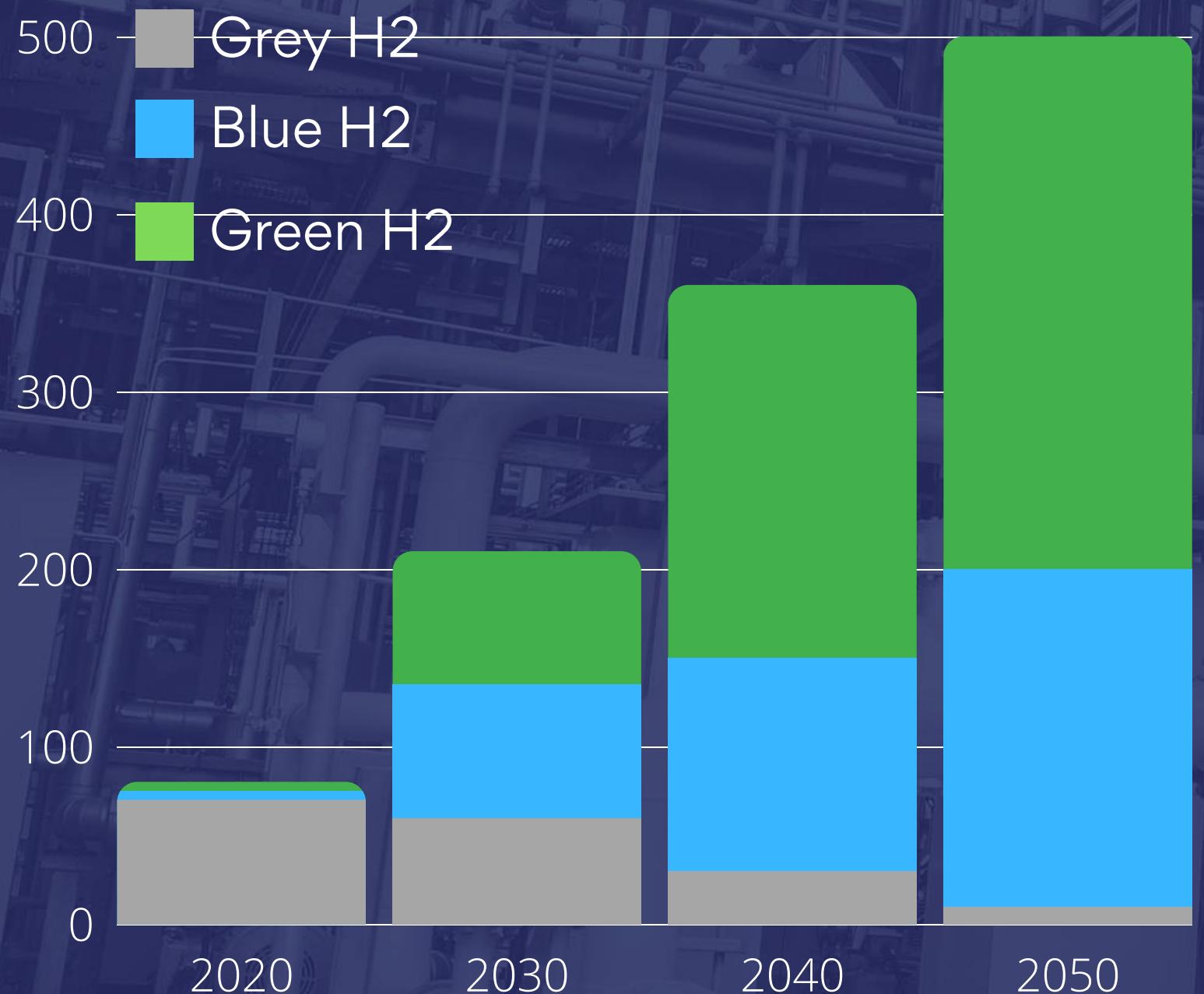


\$

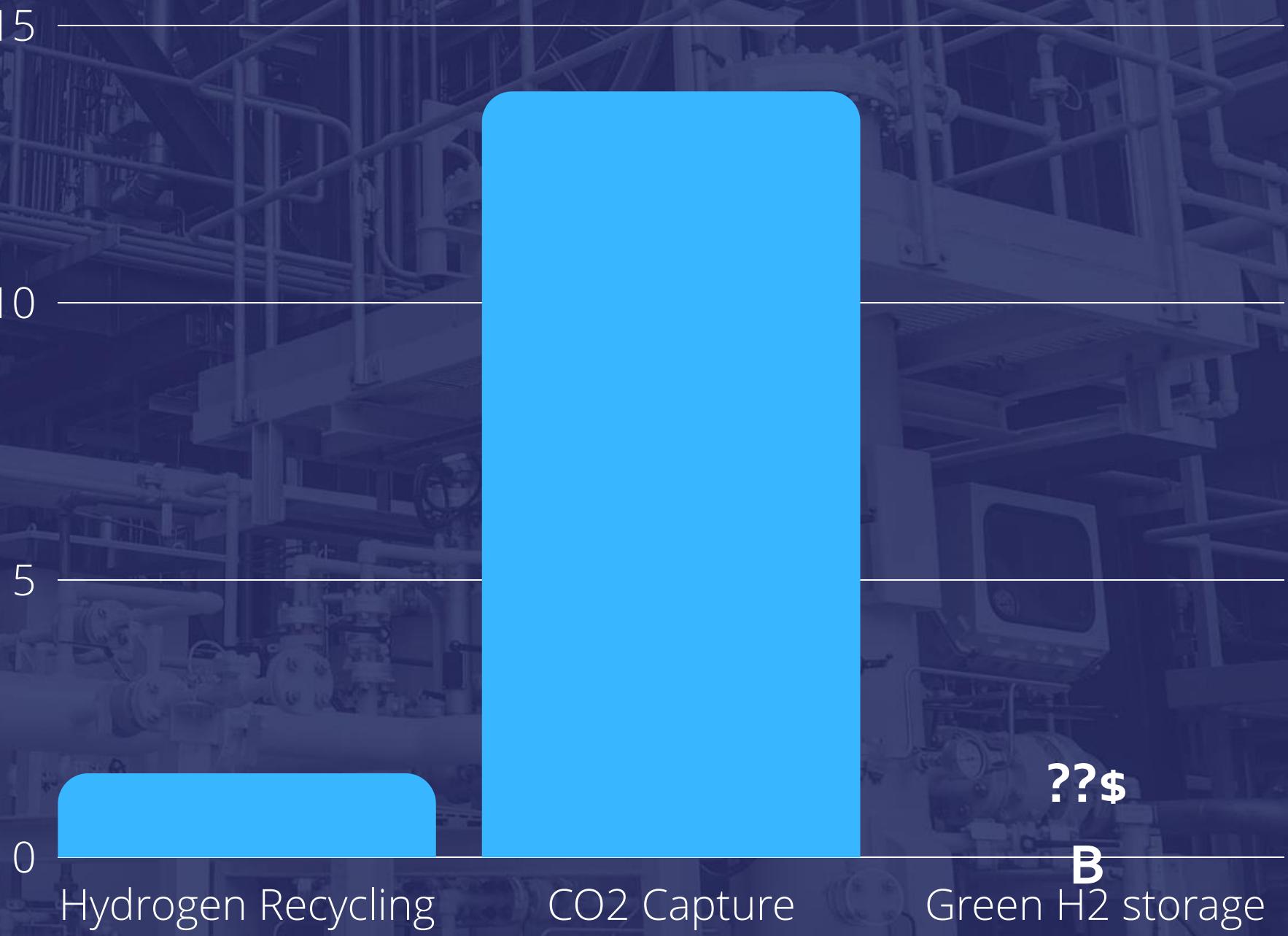
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Already massive, and ever growing Markets

Hydrogen Tonnage



Potential Sales (\$Billions)



Climate Impact

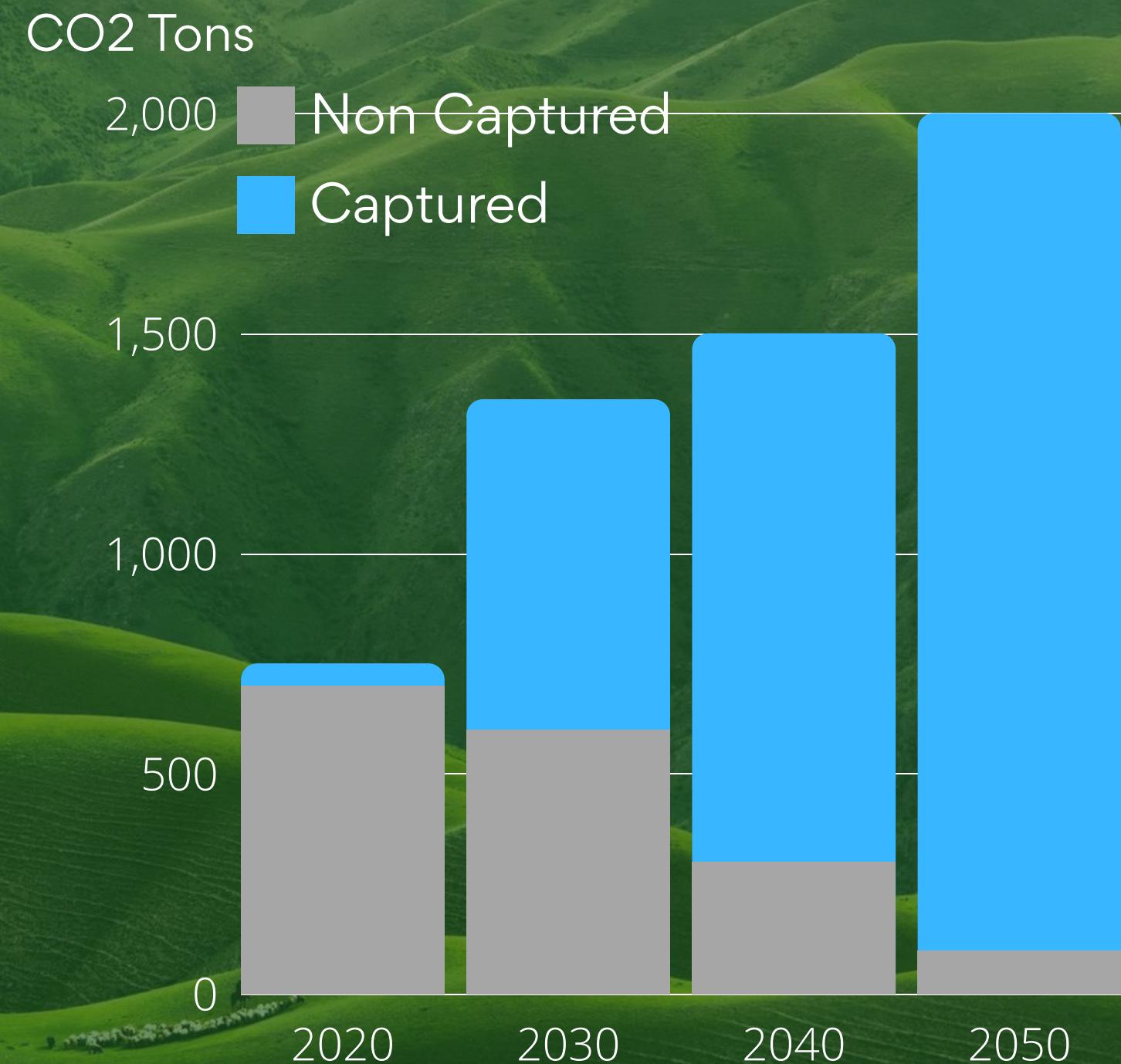
1 Ton of Grey H₂ = ~10 Tons of CO₂

750 Million tons of CO₂ made from
fossil fuel today

2 Gigatons of CO₂ by 2050

We can be a key piece of
infrastructure for all of it

CO₂ we could help sequester



IEA - "net-Zero by 2050" report from June 2021

Robustness



*and other
research
startups



Value



DiviGas is the only
membrane that

- Is Affordable
- Is Scalable
- Can handle these
difficult gases at high
performance

Client Pipeline

+08

Clients
Piloting

\$700K/yr

Average Client size
after pilot

>\$50M

In
pipeline

- Our clients are large veteran equipment providers of refineries and plants
- ^{They a}lready approved price and performance and are waiting our pilots

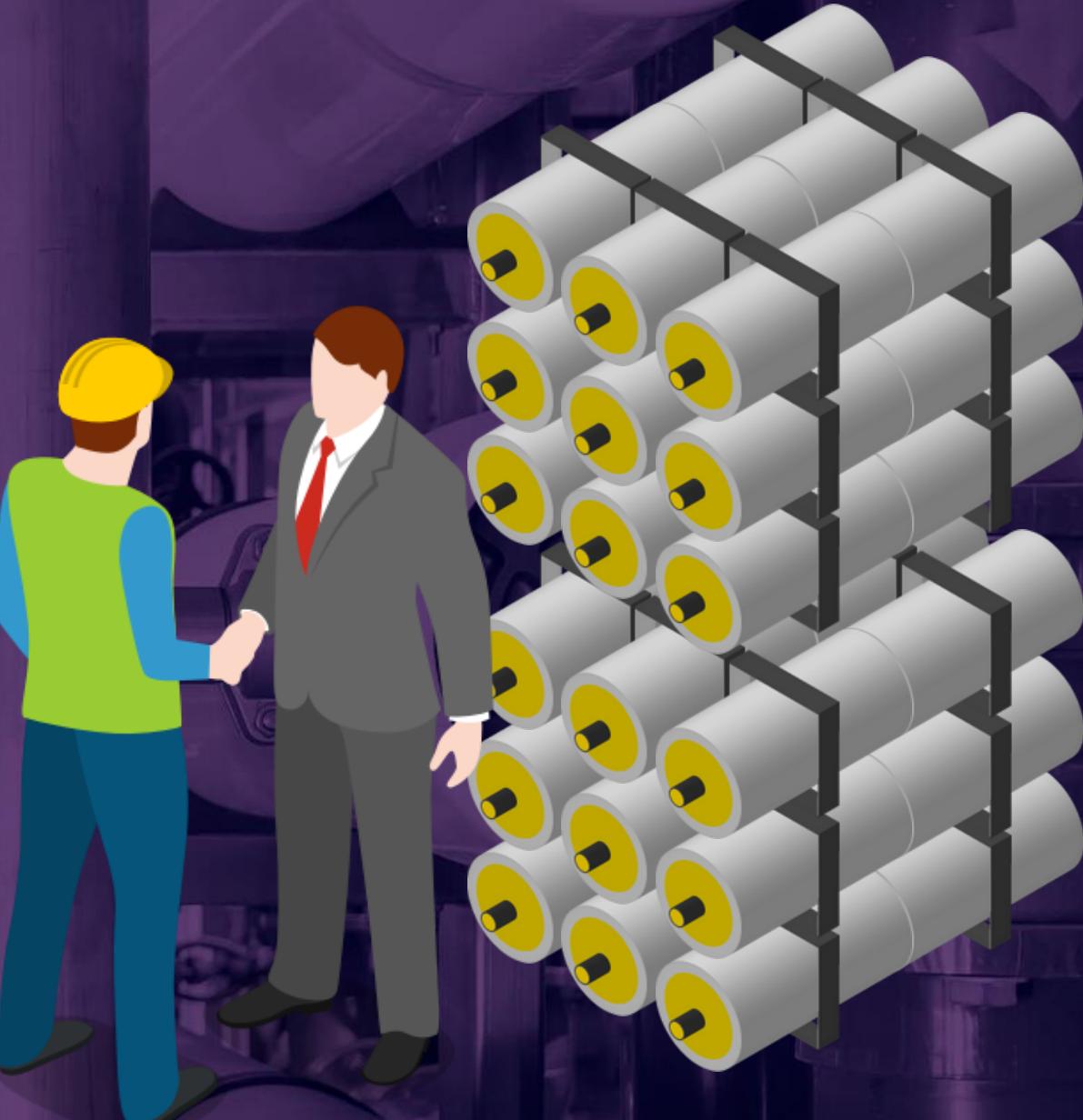
of clients

6	■ Grey H2
2	■ Blue H2*
2	■ Green H2

*overlap between Grey/Blue

Business Model

- Steel 'modules' systems sold to large plant equipment providers
 - Each module cost ~\$32,000
 - Any system can have 3-3000 modules
- Modules contain 'cartridges' that last 1-5 years before needing replacement
- System is guaranteed >15 years, deals (and revenues) locked in for decade+
- Clients can expect to save anywhere from \$60,000-\$100,000 per module or 2-3x their costs



Dr. Ali Naderi

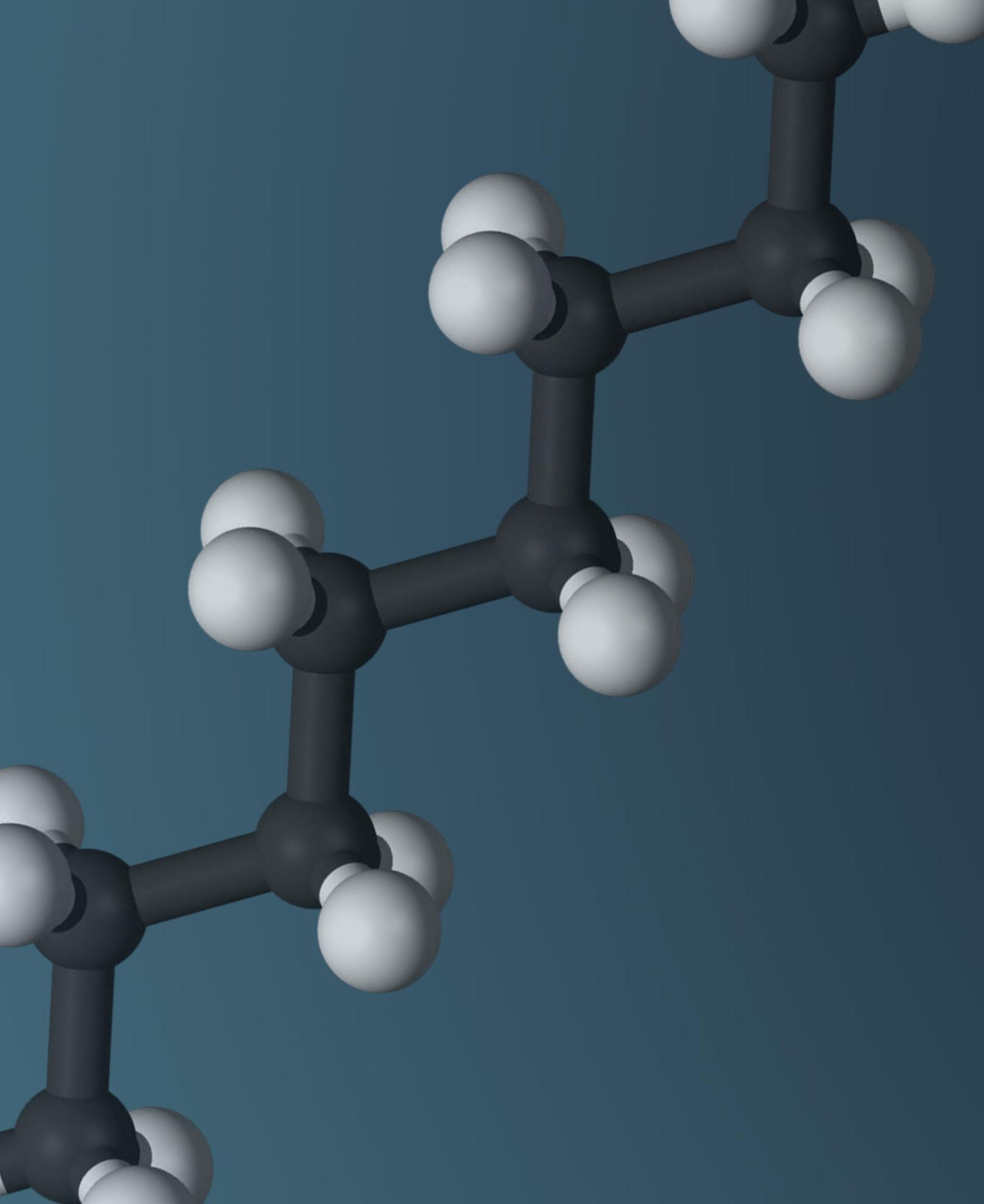
CTO, Inventor & Cofounder

Discovered the idea for the uniquely strong polymer chain structure while patenting other membrane polymer tech with NUS for BASF. He realized its potential and started DIVIGAS

10 years of commercial work and research on polymers including on

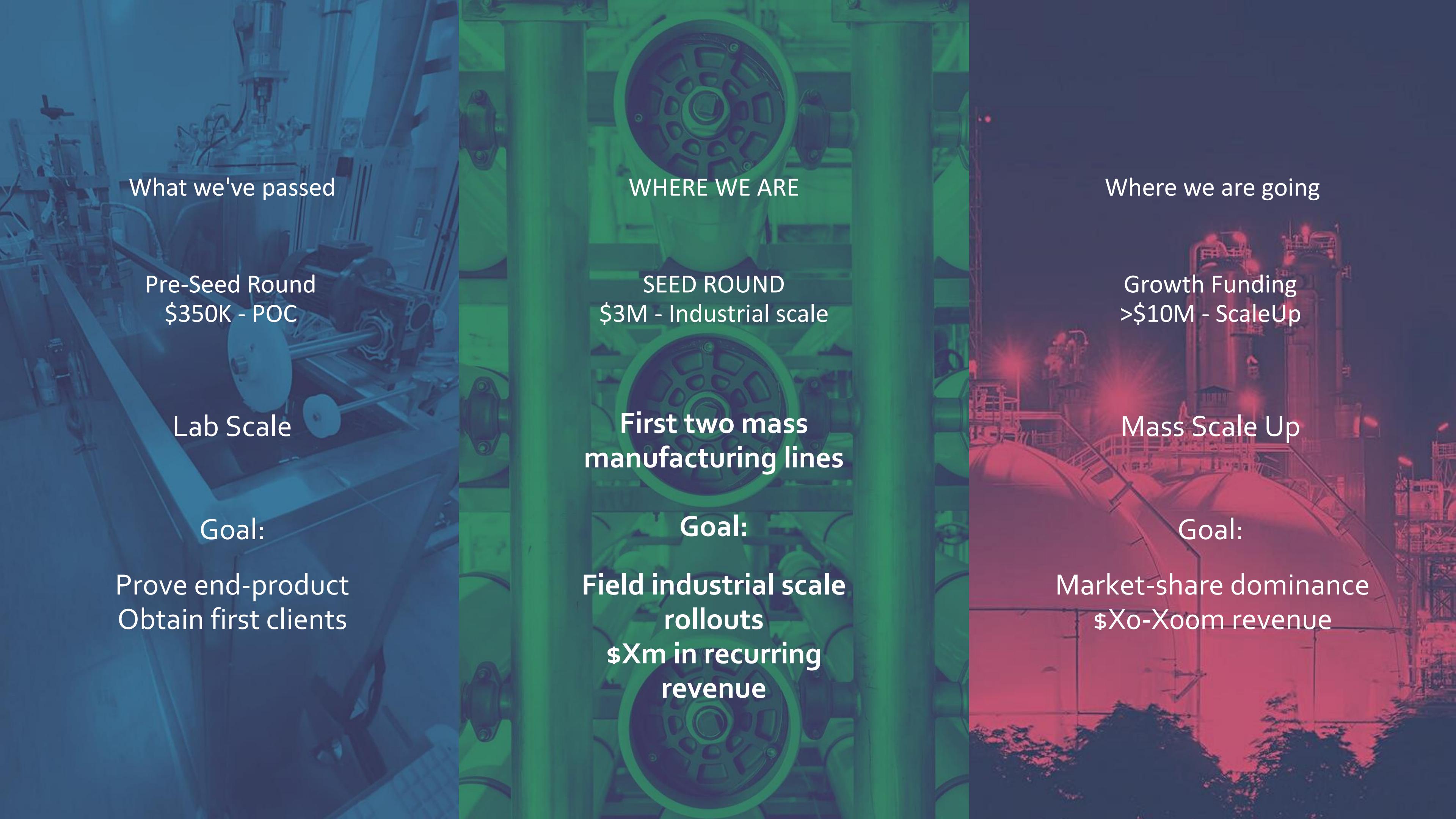
- Numerous membranes
- Space shuttle ablative shielding
- Car chassis crash dampening





Robustness at Nano-scale

- IP in combination of materials and polymer manufacturing technique
- IP completely owned by DiviGas
- Patents in process
- Cannot be reverse engineered from end product (normal for polymers)



What we've passed

Pre-Seed Round
\$350K - POC

Lab Scale

Goal:

Prove end-product
Obtain first clients

WHERE WE ARE

SEED ROUND
\$3M - Industrial scale

First two mass
manufacturing lines

Goal:

Field industrial scale
rollouts
\$Xm in recurring
revenue

Where we are going

Growth Funding
>\$10M - ScaleUp

Mass Scale Up

Goal:

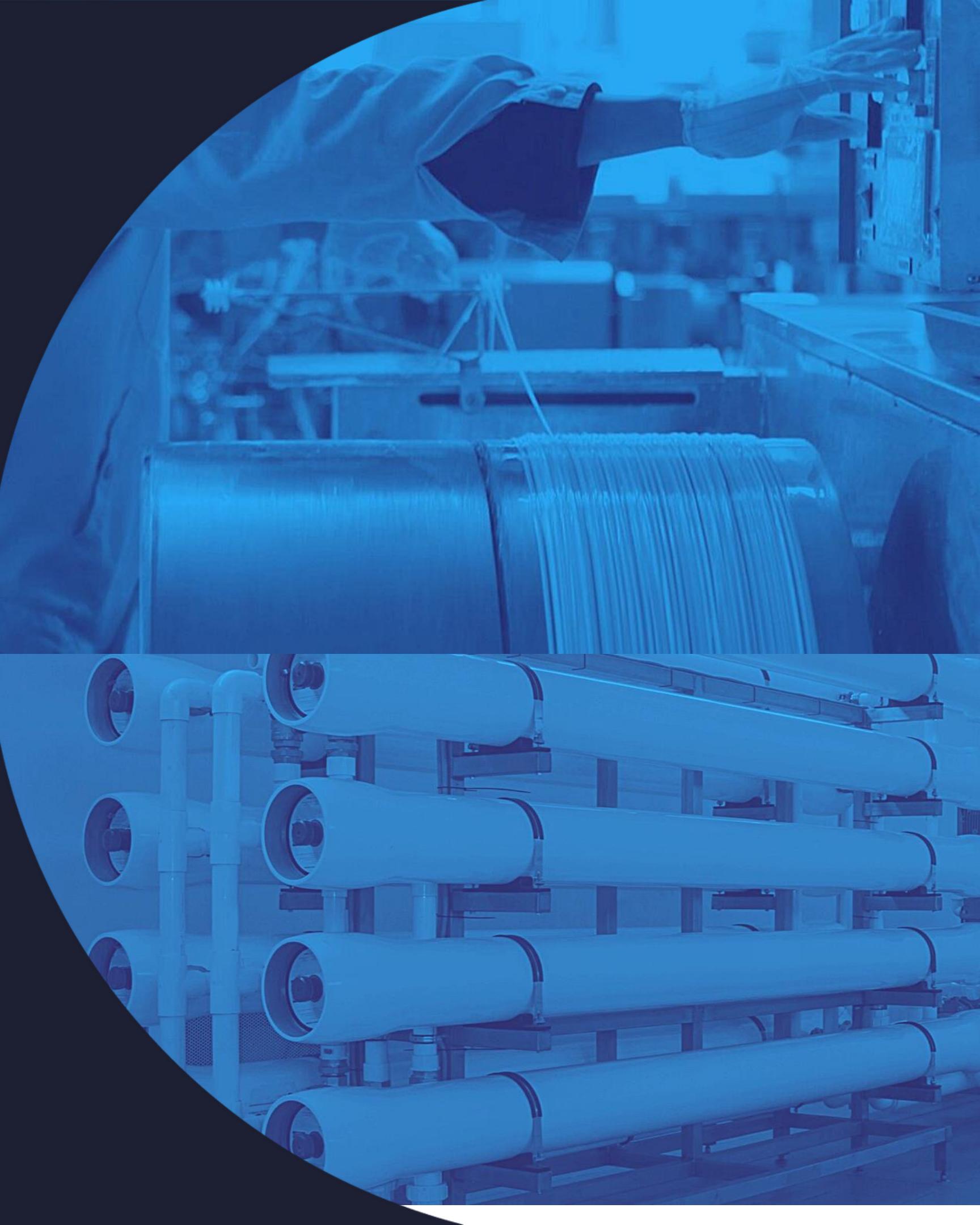
Market-share dominance
\$Xo-Xoom revenue



DIVI
GAS solution
DiviH

What this round takes us to:

- 2 manufacturing lines - 70 modules per year total
- \$3m in potential revenue
- Product Shipped, operating and outputting
- Client demand for larger systems



André Lorenceau
CEO & Founder

Repeat Founder, raised
+\$15m Capital previously

Forbes 30under30

Led a team of 60+ to
deliver global media
tech products



Dr. Ali Naderi
CTO & Founder

Master in Polymer Eng.

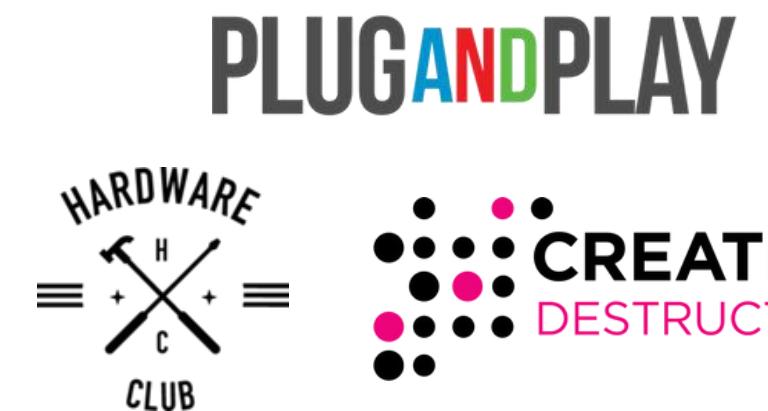
Ph.D. in Chemical Eng.

10 years of work and
research experience
on polymers

Funded and Backed
by

HAX **SOSV** **e-π**

Selected by and part
of



NEW
ENERGY
CHALLENGE

rockstart. YES! DELFT Shell
StartUp Engine



DIVI
GAS

ALL SLIDES AFTER
THIS ARE ANNEX

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Whatsapp

Grey Hydrogen

What:
Recycle wasted Hydrogen

Market:
\$1-3B in membranes
6 Clients found

Why us:
Tough gas handling

Where:
Refineries
PolyPropylene/Ethylene
Nylon 6 plants

Market stage:
Mature

Use Cases

Blue Hydrogen

What:
Carbon Capture at H2 plants

Market:
\$14B in membranes
2 Clients found

Why us:
Co2 separation performance

Where:
Hydrogen plants

When:
Emerging

Green Hydrogen

What:
Green Hydrogen Energy Storage

Market:
\$???B in membranes
2 Clients found

Why us:
Co2 separation performance

Where:
H2 storage sites

When:
Nascent

Multiple Potential on Seed in an Exit Scenario

Bottom up analysis of market through one client that wants us to deliver >100 modules in 2023

Burns & McDonnell
Type: Hydrotreater recovery
\$3m /yr deal = \$45m in guaranteed/booked revenue over 15 yrs

1 out of 6 refineries - 2 hydrotreaters per refinery.
These 12 units could be worth \$36m a year, or \$540m guaranteed/booked revenue by 2024

We already have 6 clients with similar use cases.

Exit multiple (private or IPO) will not be on EBITDA but on market potential, booked revenue and clean impact. If we have \$150m in booked revenue in 2024, we would not sell for less than \$100m

This is before smaller but very rapidly growing other markets

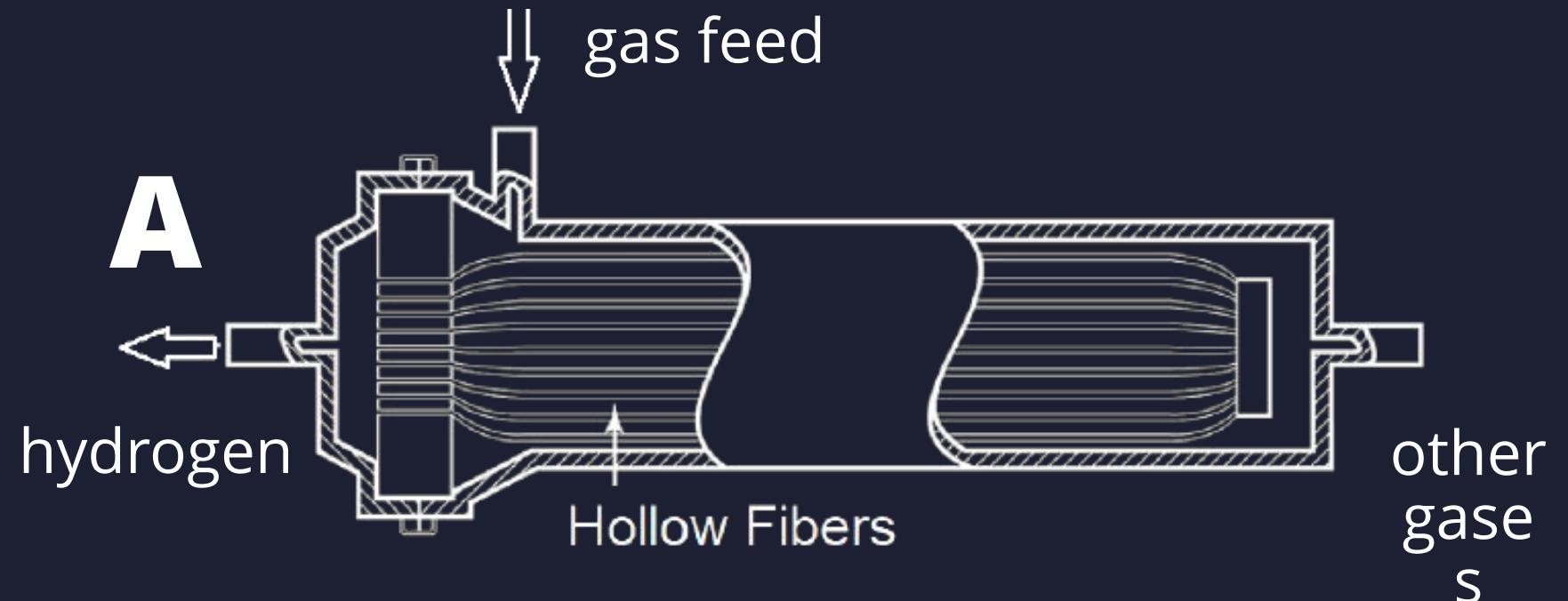
- Other petrochemical Recovery (Likely another \$1b a year)
- Carbon capture (another >\$10B/yr market)
- H₂-renewable energy storage (multiple \$B/yr market).

All numbers millions								Multiple on Seed (20% dil. per rd)
Date	Stage	Revenue /yr	% of hydrotreater market	Booked revenue	Valuation multiple (on Booked rev)	Exit price		
2021-2022	Seed	\$3.5	0.08%	\$52.5	2	\$105	8	
2023-2024	Series A	\$20	0.44%	\$300	2	\$600	38	
2025-2026	Series B	\$75	1.67%	\$1,125	2	\$2,250	115	

There's 1500 hydrotreaters in the world. A potential of \$4.5b/yr in sales on this use case alone, locked for 15 years for \$67.5b in total revenue.

How it works - in detail

- Mixed gas feed containing Hydrogen pushed through proprietary polymeric hollow fibers (A)



- Pressure drives a molecular separation of the Hydrogen only (B) - [See video here](#)

Pure Hydrogen comes out at slightly lower pressure

Other Gases (such as CO₂) come out together at full pressure

Carbon Capture (CCUS) Economics

For Carbon Capture, a huge portion of the cost is in compression of CO₂ after separation



*AW = Amine Wash chemical process

Our membrane is the only one that can separate pure CO₂ from H₂ at full pressure, dramatically reducing CCUS costs by removing compression needs

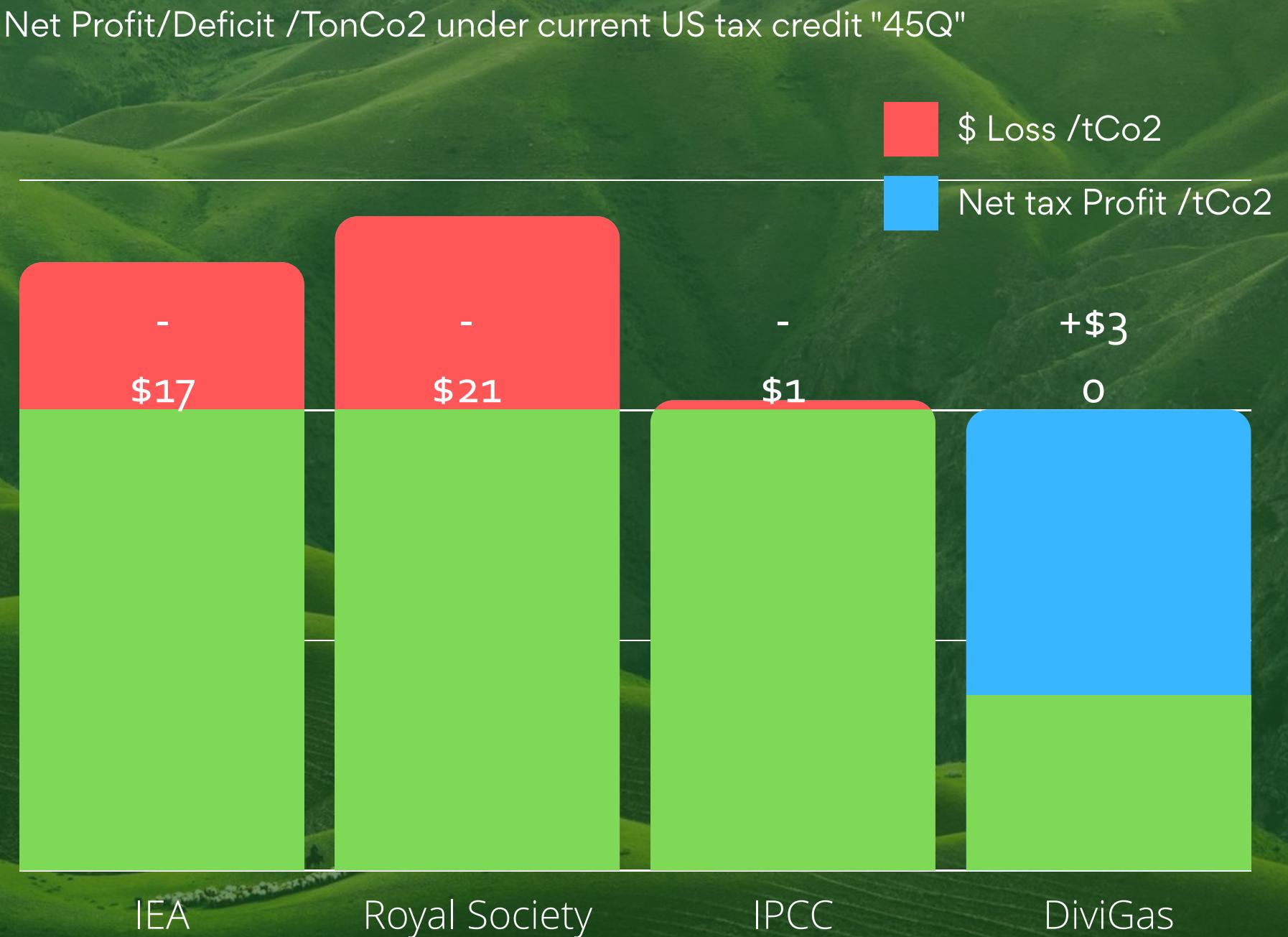


Carbon Capture (CCUS) Economics III - Carbon Taxes

A number of laws today give tax breaks or price each ton of CO₂ emitted.

At \$50/CO₂ton, already existing in the US and multiple countries our technology, (as show on the right), would save \$30 per ton of CO₂, and since H₂ produces ~10 CO₂ weight per H₂, we save \$300 in credits per ton of H₂ separated

- **Significant Existing laws to price CO₂**
 - US '45Q' - ~\$50/ton tax credit
 - France - ~\$49/ton tax
 - Sweden - ~\$119/ton tax
 - EU (ETS) - ~\$19/ton (world bank)
 - And many more
- **Incoming Laws**
 - EU Covid package (30% for climate, June 2021)
 - Chinese 2030 neutrality plan (est 2021)
 - Biden US Climate package (est 2021)
 - Japan Carbon tax upgrade (est 2021)
 - Korea Carbon tax upgrade (est 2021)



Carbon Capture (CCUS) Economics II

Today making 1 ton of hydrogen makes 10 ton of CO₂ costing a total of \$130 (without CCUS)

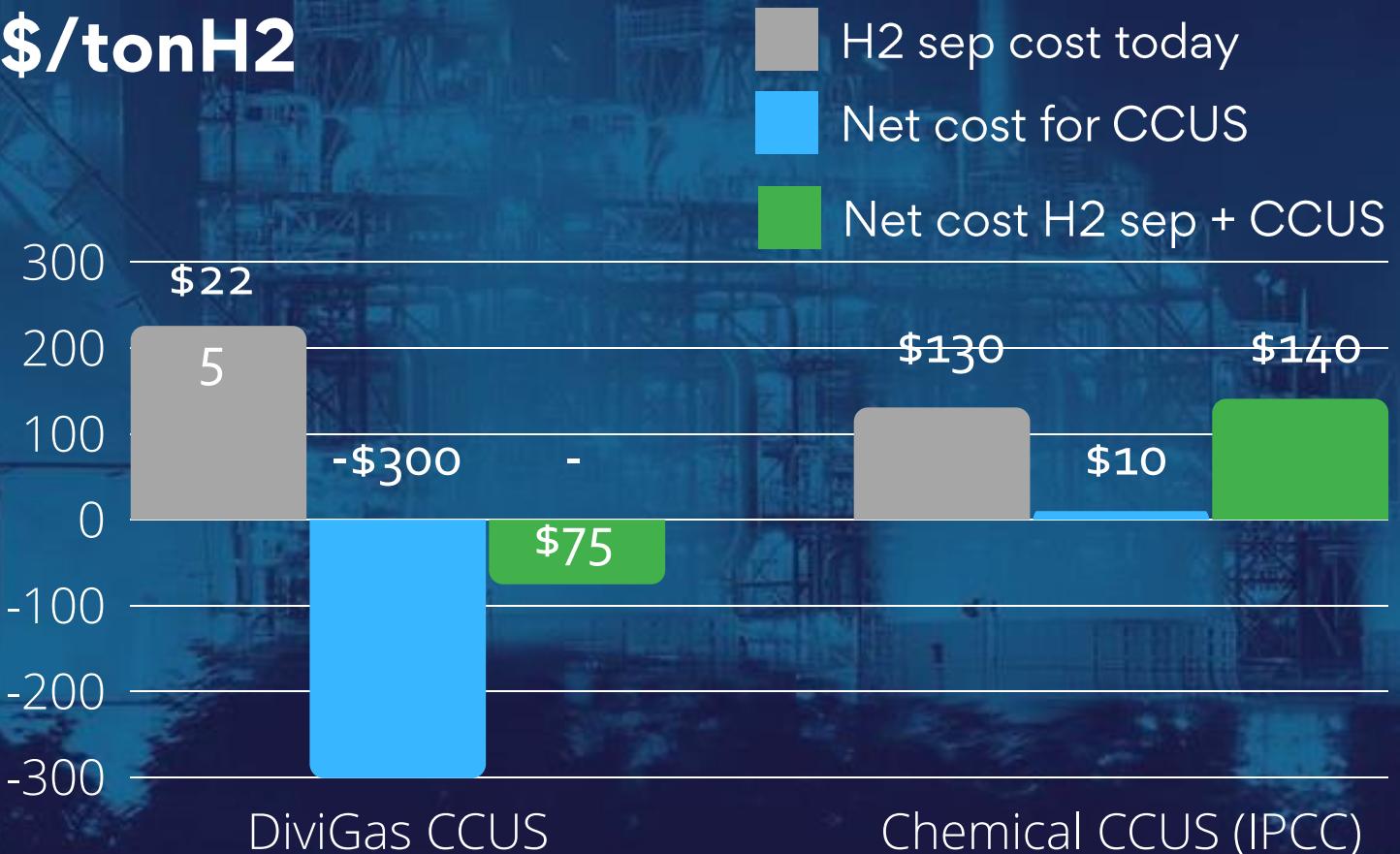
Under "45Q", the \$50/tonCO₂ tax credit, DiviGas CO₂ capture would create a \$300 of tax credit per ton of H₂, resulting in a total of \$75 in profit /tonH₂, before even selling/using the H₂

For more math on the topic, check out our 3 in depth annex slides

Cost Of H₂ separation with/without CCUS



\$/tonH₂



Theoretical SMR CCUS Stream

SMR
Purity%
Recovery%

99.00%
95%

Number of module total
Stage 1
Stage 2

68
60

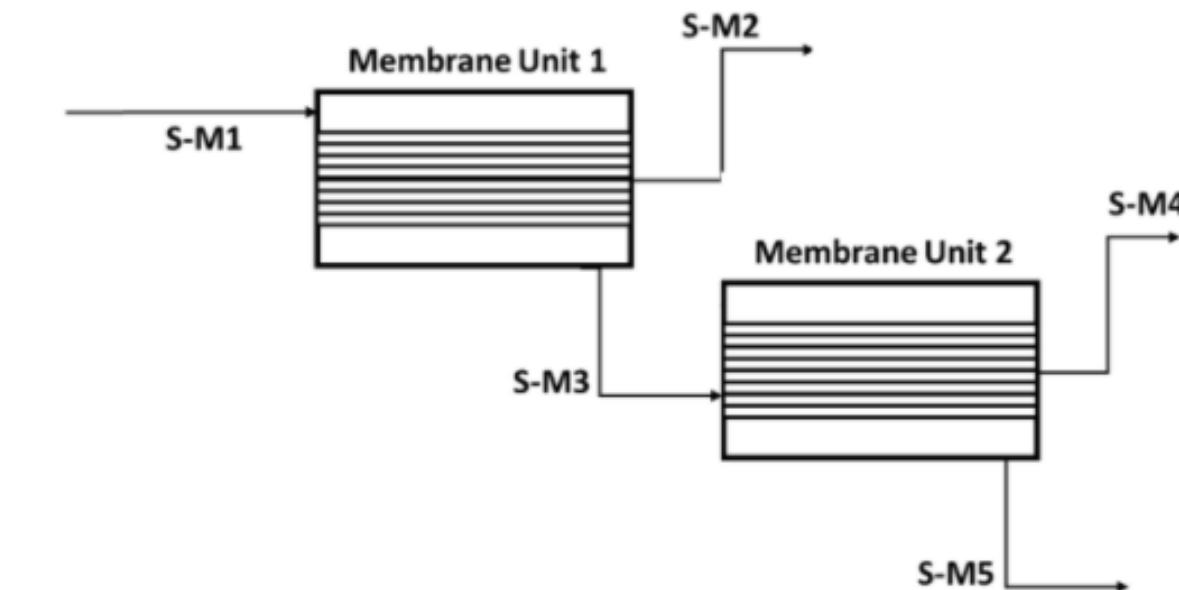
Inlet (SM1)		
% MOLE	Kmol/hr	Mass (Kg/hour)
TOT	100%	201.716
H2	80%	161.4
CO2	20%	40.3
		2100
Temp		150
Pressure		60
1775.5		



Post Membrane (SM2)		
% MOLE	Kmol/hr	Kg/hour
TOT	100%	152
H2	99.0%	152
CO2	1.0%	0.40343
		321
17.75092		
Temp		150
Pressure		45



To Usage



Residue 1 (SM3)		
% MOLE	Kmol/hr	Kg/hour
TOT	100%	49.5
H2	19%	9.6
CO2	81%	39.9
		1777
1757.3		
Temp		150
Pressure		60



OPTIONAL STEP IF WANT PURER CO2

Second Membrane Permeate (SM4)		
% MOLE	Kmol/hr	Kg/hour
TOT	100%	9.430
H2	99.0%	9.030
CO2	1.0%	0.399
		36
17.6		
Temp		150
Pressure		45

To Usage or Discard



Second membrane Residue (SM5)		
% MOLE	Kmol/hr	Kg/hour
TOT	100%	40.1
H2	0.1%	0.6
CO2	99.9%	39.5
		1740.91
1739.77		
Temp		150
Pressure		45

To Co2 Capture Pipeline