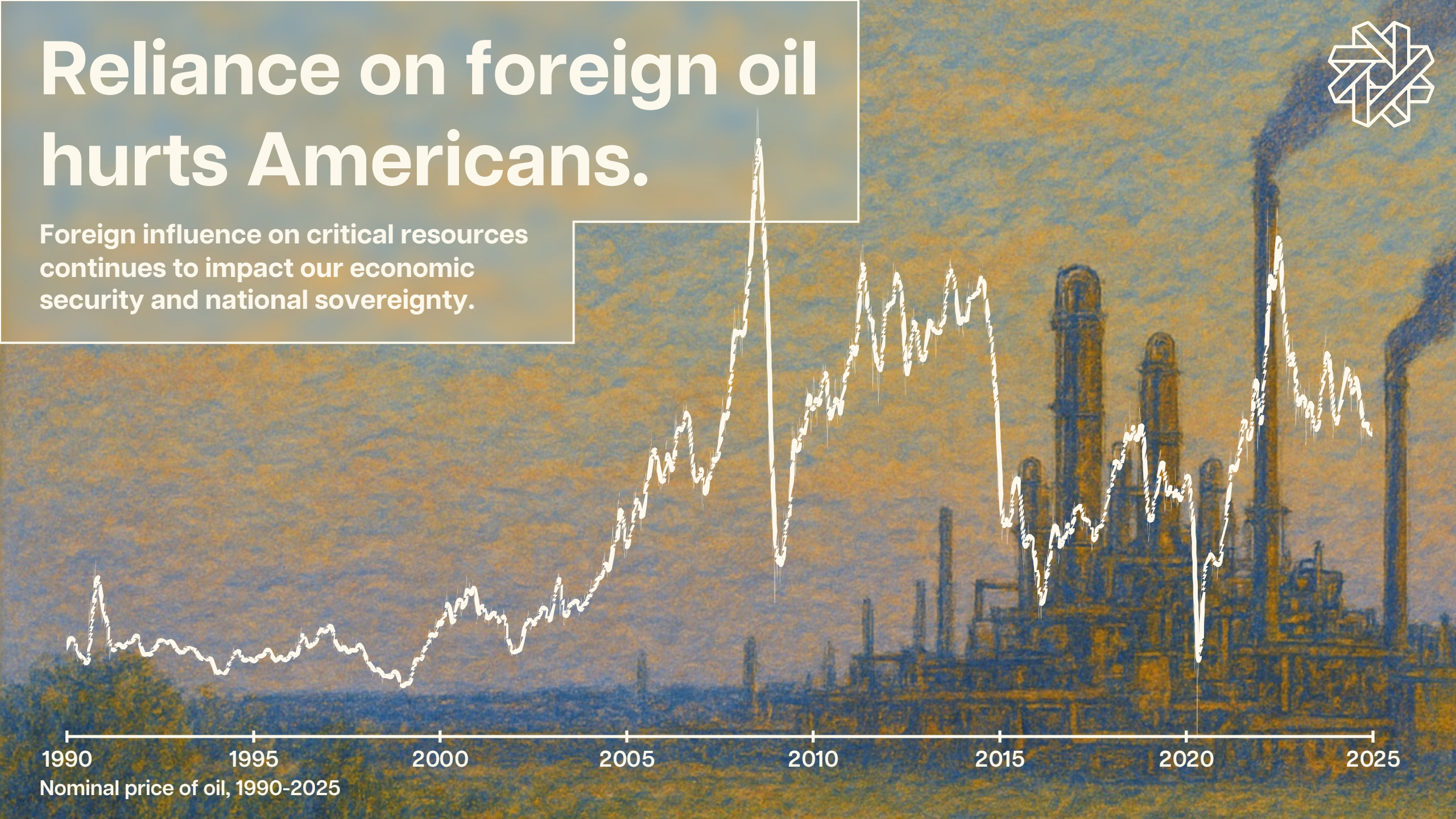
Integrated Dynamics, Inc.

Onshoring production of critical chemicals with next-gen biorefineries.

Reliance on foreign oil hurts Americans.

Foreign influence on critical resources continues to impact our economic security and national sovereignty.



Nominal price of oil, 1990-2025

There is a way out.

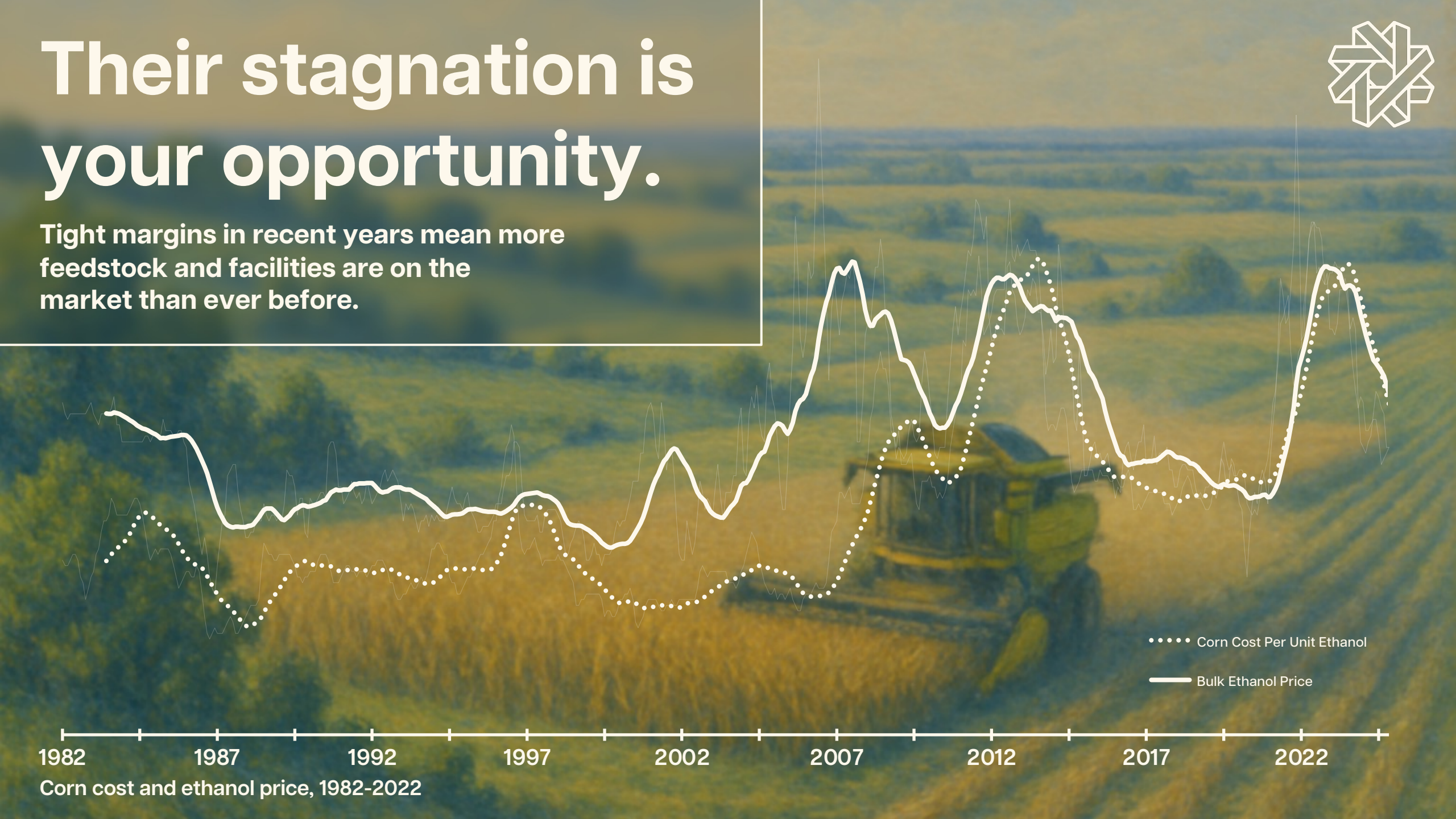
America's corn-ethanol industry is a successful pilot in resource security, but has limited impact due to the E10 cap.

What if we applied this model to every other imported fuel and chemical?

POET's facility in Fairmont, NE

Their stagnation is your opportunity.

Tight margins in recent years mean more feedstock and facilities are on the market than ever before.



Corn cost and ethanol price, 1982-2022

With new biology...

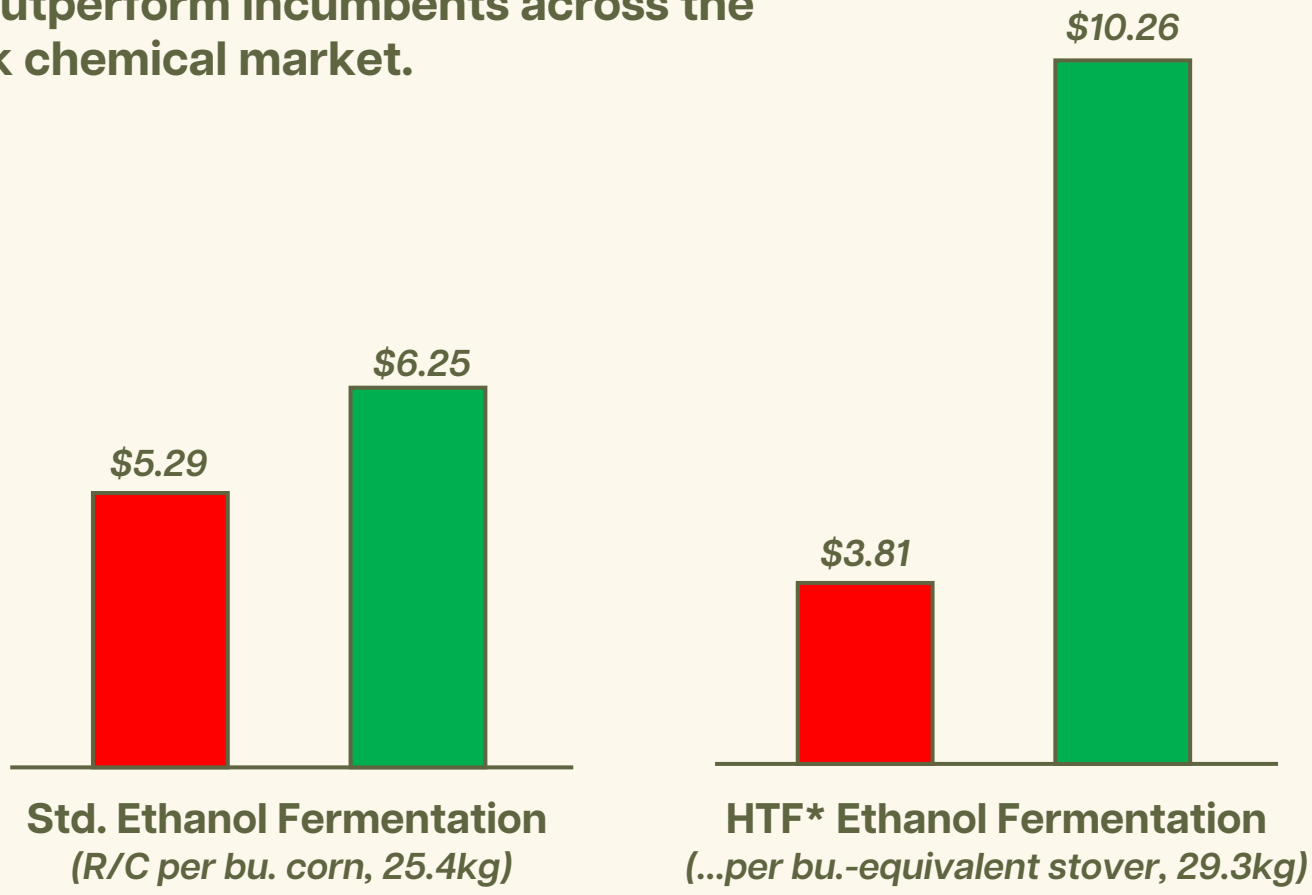
...and some tweaks here...

...we can make a plant like this >4x more profitable and help revitalize our chemical industry.

POET's facility in Fairmont, NE

The market opportunity.

We purpose-built a new biological platform to outperform incumbents across the bulk chemical market.



Std. Ethanol Fermentation
(R/C per bu. corn, 25.4kg)

HTF* Ethanol Fermentation
(...per bu.-equivalent stover, 29.3kg)

*High-Temperature Fermentation, TEA available upon request

We're attacking a $50B market with unprecedented margins.

How we'll do business.

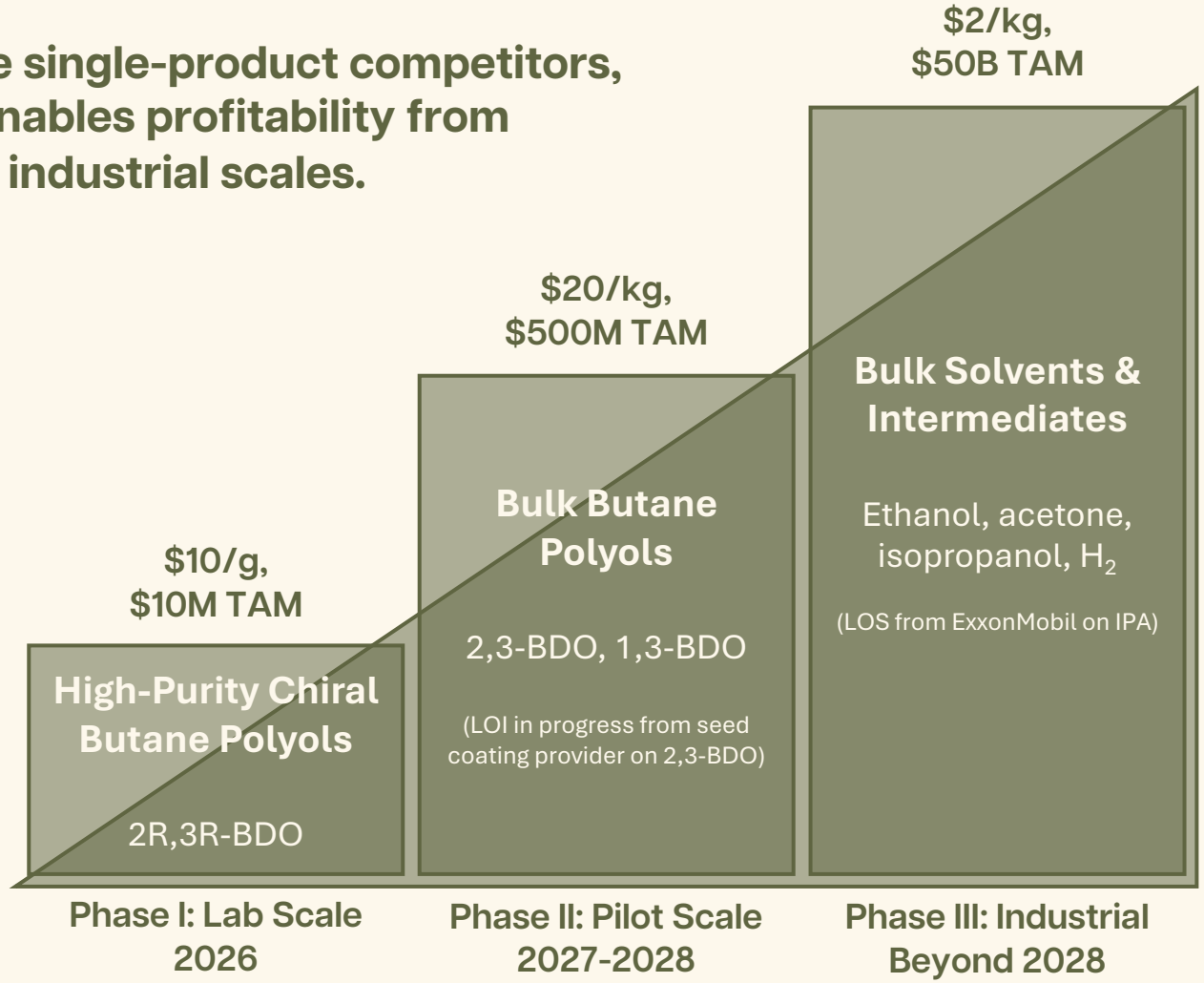
We're going to acquire distressed ethanol plants, drop in our technology, and capture profit from cheaper feedstocks, domestic production, and higher-margin products.

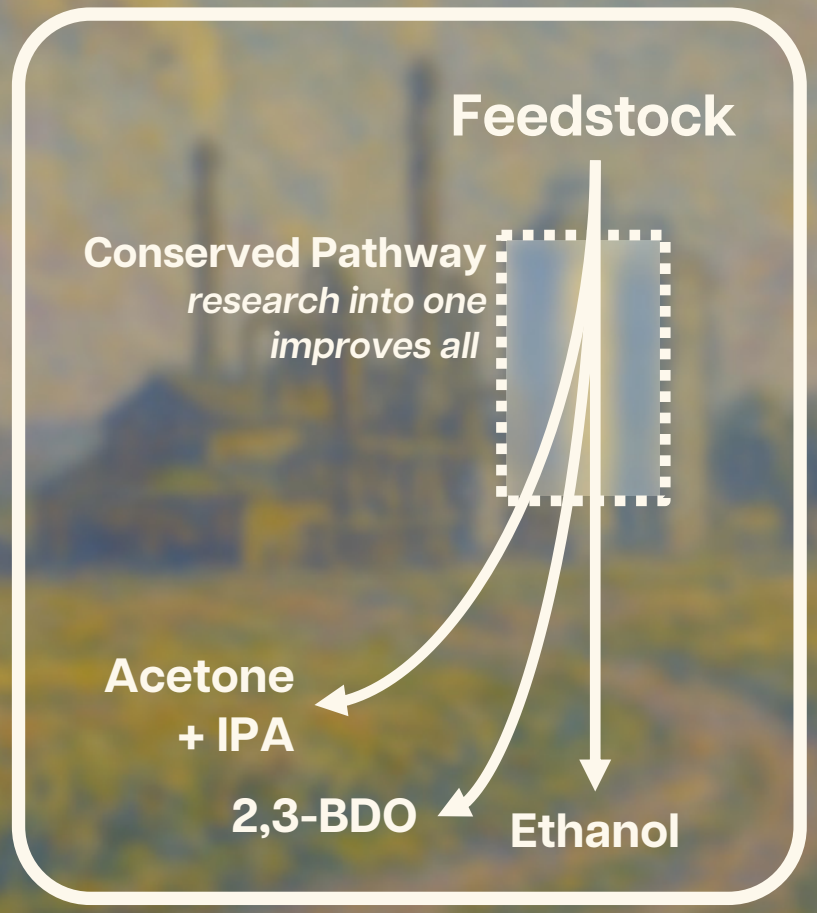
Example: Fulton Ethanol sold by county for $5M in 2025, built for 100Mgpy capacity, unused because of margin squeeze.

Our “wedge” GTM.

R&D continuity means that we can make fine and bulk chemicals with the same research.

Unlike single-product competitors, this enables profitability from lab to industrial scales.





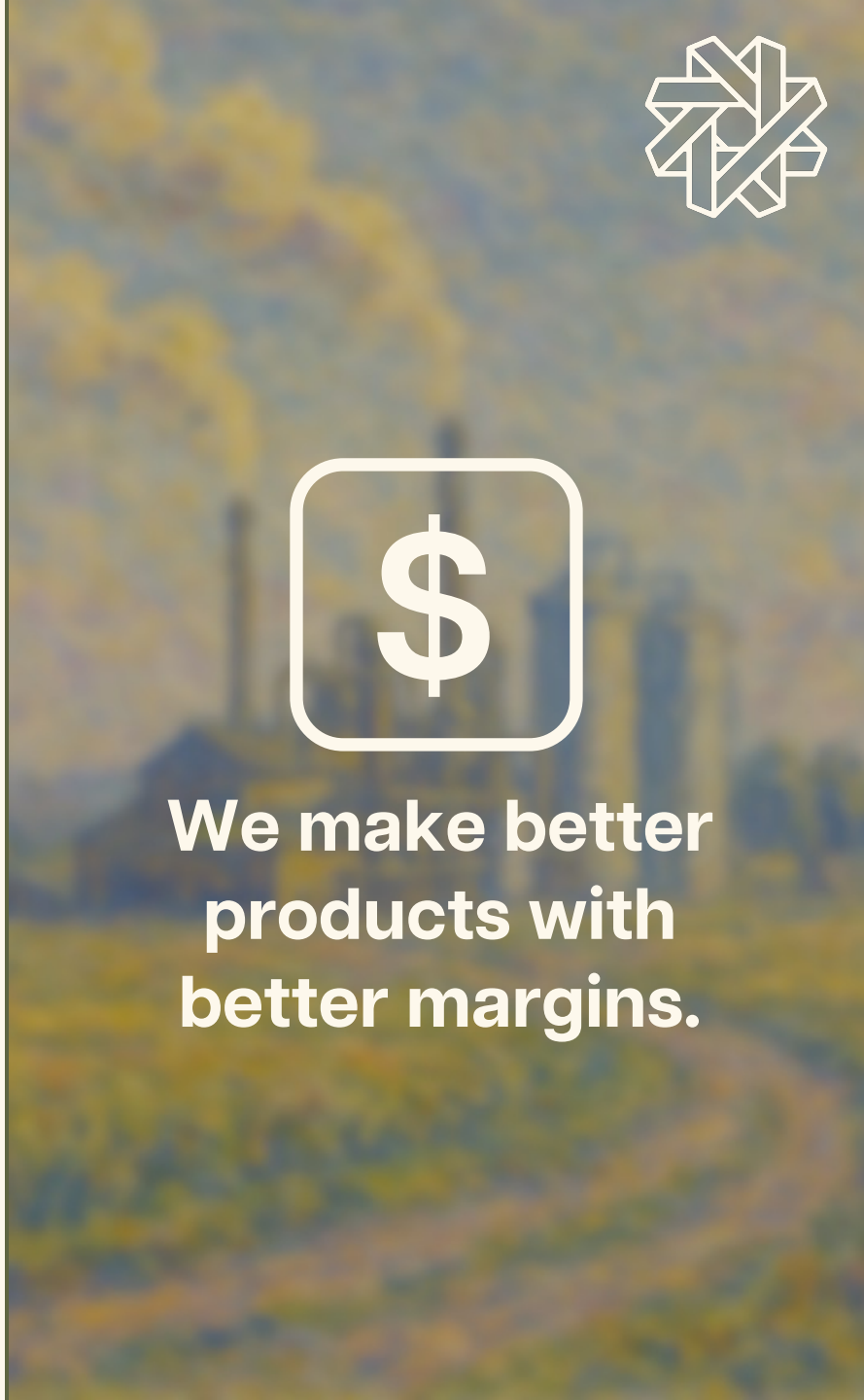
R&D continuity

Beachhead: *chiral butane-polyols.*

Chiral C4 polyols are used in pharma, defense, and agrochemical products.

Sensitive use cases demand extremely pure product, above 99.5%.

Existing chemistry has poor purity; existing biology is too expensive.
We win this market.



Endgame: *solvents.*

>60% of ethanol's cost is corn; biomass is less than half the cost.

Our process runs ~2x as fast, spreading capital costs further.

Co-producing H_2 enables on site SAF production.

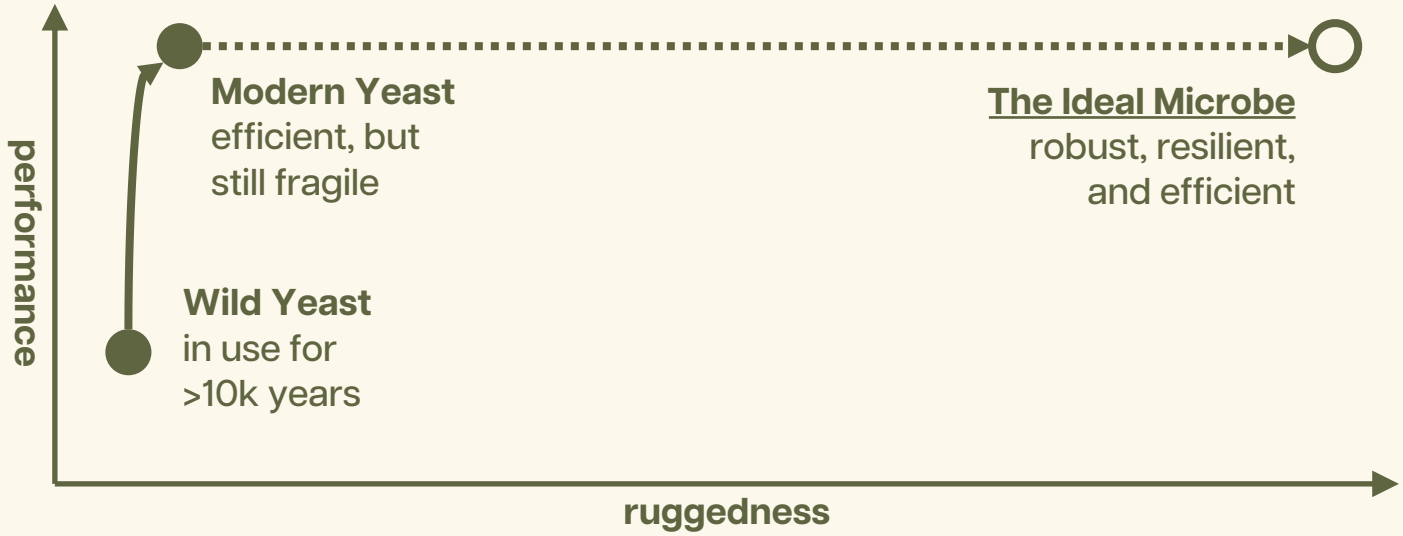
We cut boiling cycles by 50% for lower CO_2e.

The state of the art.

Modern bioprocess is not yet robust enough to out-perform existing petrochemical solutions.

Research in the field primarily focuses on **engineering already-performant strains** to grow faster, resist contamination, use cheaper feedstocks, and make new chemicals.

It has become apparent that engineering robustness is substantially harder than increasing performance was.



Existing barriers to industrial viability:

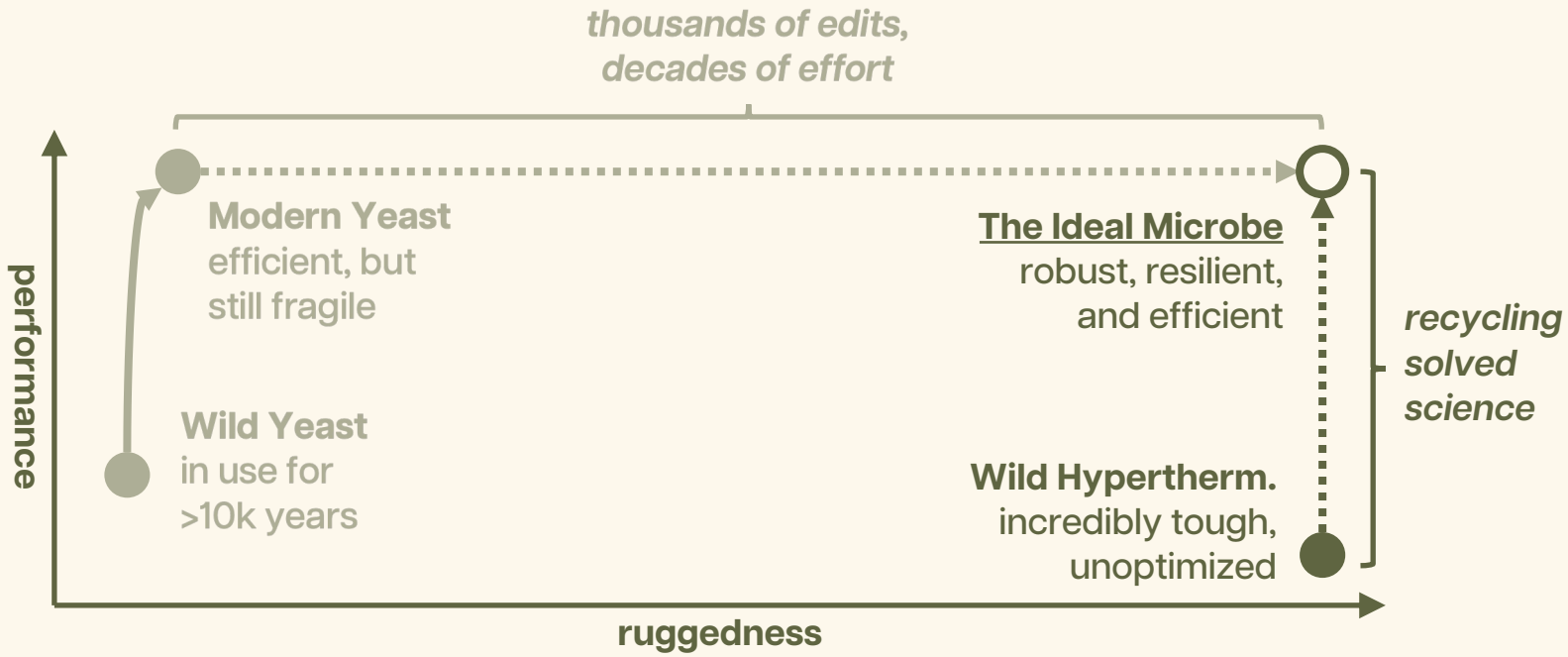
- Low specific productivity
- Vulnerable to contamination
- Uses expensive feedstocks

How we're different.

There already exist microbes with the industrially-valuable traits needed to make bioprocess viable at scale.

By **working with these naturally robust microbes**, we can re-apply existing science to make a rugged *and* performant microbe.

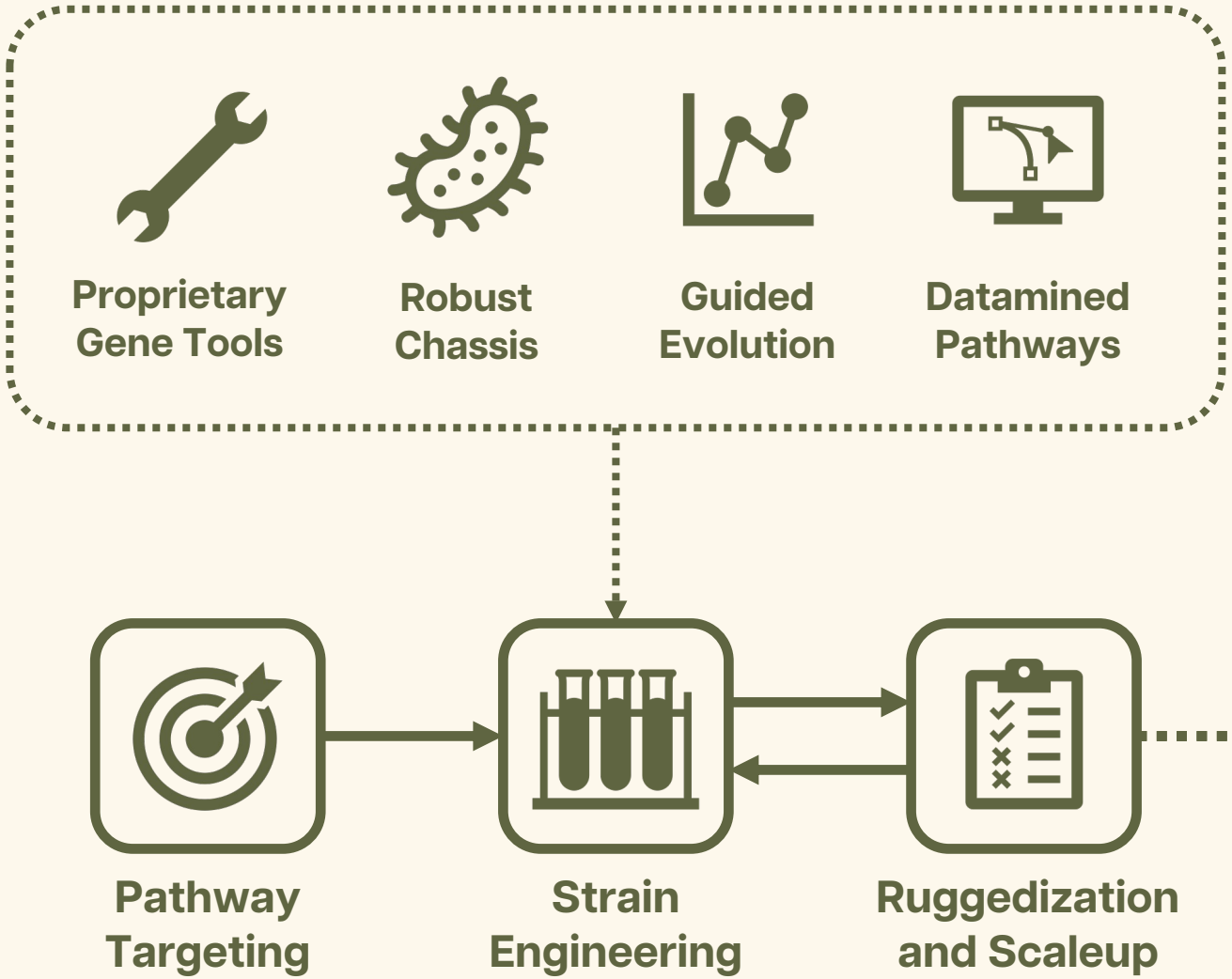
This ends up being much easier.



Removed barriers to industrial viability:

- High specific productivity
- Invulnerable to contamination
- Uses inexpensive feedstocks

How we'll dominate.



Our wins, so far.

- Highest-Temp. Growth on Cellulose (@ 95°C)
- Best Archaean Ethanol Pathway (by 6x)
- Highest-Temp. Acetone Pathway (@ 95°C, by 20°C)

Our team.

Henry Markarian

CEO, leads product, fundraise, and scaling strategy.

BS CompE @ UIUC
Led scaling at Natrion
FDE at Palantir

Niranjan Kulkarni

CTO, leads fermentation design and pathway implementation.

BS BioE @ UIUC
Founded IdeateX
JI Lab Researcher

Corey Kennelly

Synbio Lead, leads strain/metabolic engineering.

PhD Bio @ NU
Research published in Cell, ASM

Our advisors.

Obi Ofoegbu

VP of Engineering
at Amp Americas LLC.

Seasoned ChemE with experience in project development.

Carl Wolf

prev **COO,** 14 years
at LanzaTech

Experienced operator and manager in the synfuels space.

Dr. Harvey Blanch

Professor Emeritus
at UC Berkley

CSO/CTO at US DOE Joint BioEnergy Institute @ LBNL.

Lee Olson

CEO at United Wisconsin Grain Producers

Extensive experience running and building ethanol facilities.

Integrated Dynamics, Inc.

Raising $3M to complete FEL 0-2, scale past 10kL, and prepare for >10mgy plant acquisition in 2028.