LanzaTech

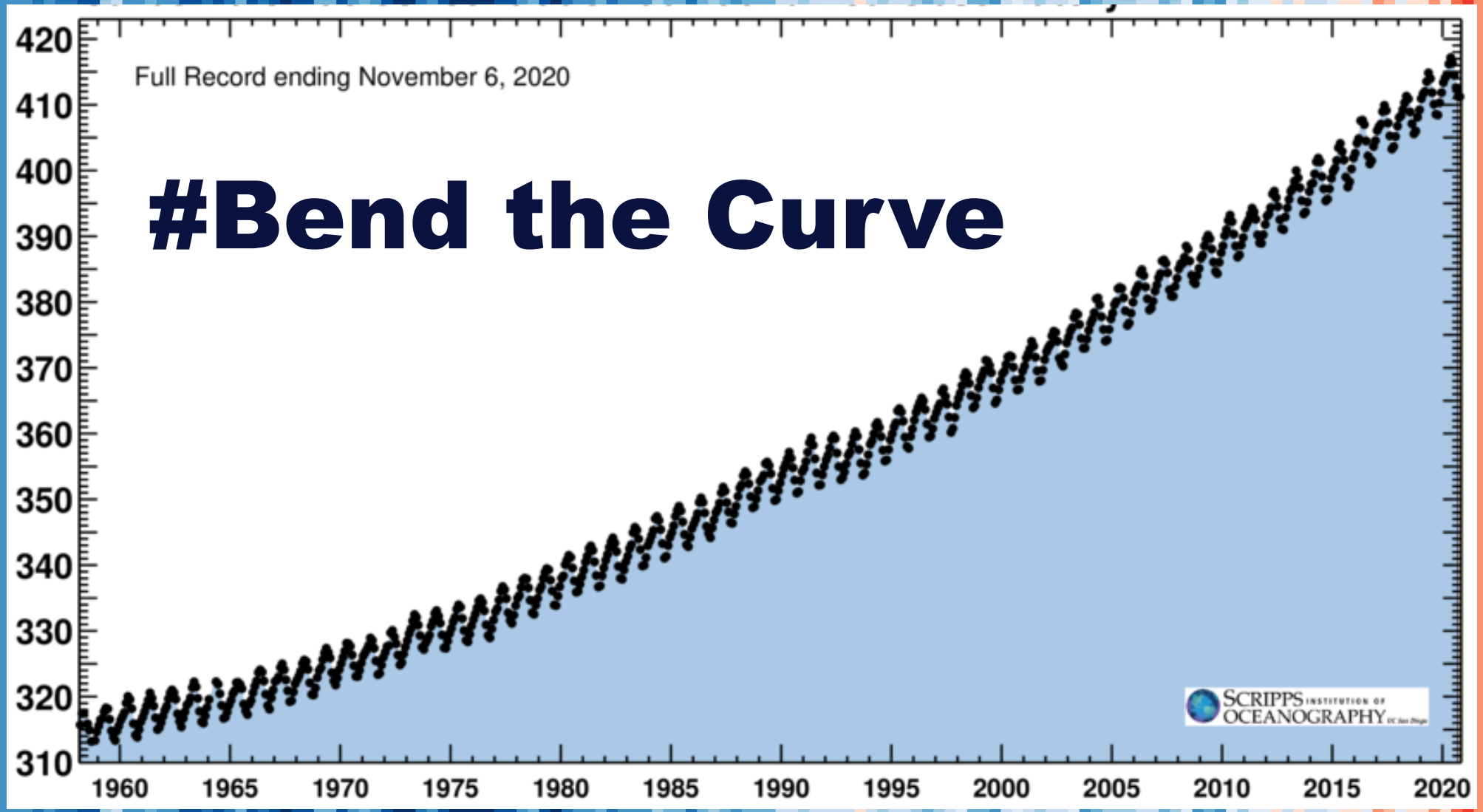
Becoming CarbonSmart

Creating the New Carbon Economy

Disclaimers

Certain statements in this presentation (the "Presentation") may be considered forward-looking statements. Forward-looking statements generally relate to future events or LanzaTech NZ, Inc.'s (the "Company") future financial or operating performance. For example, statements concerning the following include forward-looking statements: the potential success, cost and timing of the Company's technology platform development activities; the potential attributes and benefits of the Company's technology platform; the Company's ability to compete with other companies currently marketing or engaged in the development of similar technologies; the size and growth potential of the markets for the Company's technology and the Company's ability to serve those markets; the rate and degree of market acceptance of the Company's technology; and the Company's ability to expand its business. In some cases, you can identify forward-looking statements by terminology such as "may", "should", "expect", "intend", "will", "estimate", "anticipate", "believe", "predict", "potential" or "continue", or the negatives of these terms or variations of them, or similar terminology. Such forward-looking statements are subject to risks, uncertainties, and other factors which could cause actual results to differ materially from those expressed or implied by such forward-looking statements. These forward-looking statements are based upon estimates and assumptions that, while considered reasonable by the Company and its management, as the case may be, are inherently uncertain. New risks and uncertainties may emerge from time to time, and it is not possible to predict all risks and uncertainties. Factors that may cause actual results to differ materially from current expectations include, but are not limited to, various factors beyond management's control, including general economic conditions and other risks, uncertainties and factors associated with companies, such as the Company, that are engaged in developing proprietary carbon capture technology; changes to environmental laws and regulations; changes to ethanol regulation; and overall business and economic conditions affecting the global carbon capture, utilization and storage industry. Nothing in this Presentation should be regarded as a representation by any person that the forward-looking statements set forth herein will be achieved or that any of the contemplated results of such forward-looking statements will be achieved. You should not place undue reliance on forward-looking statements in this Presentation, which speak only as of the date they are made and are qualified in their entirety by reference to the cautionary statements herein. Except as required by law, the Company undertakes no duty to update these forward-looking statements.

Atmospheric CO_2 Parts per Million

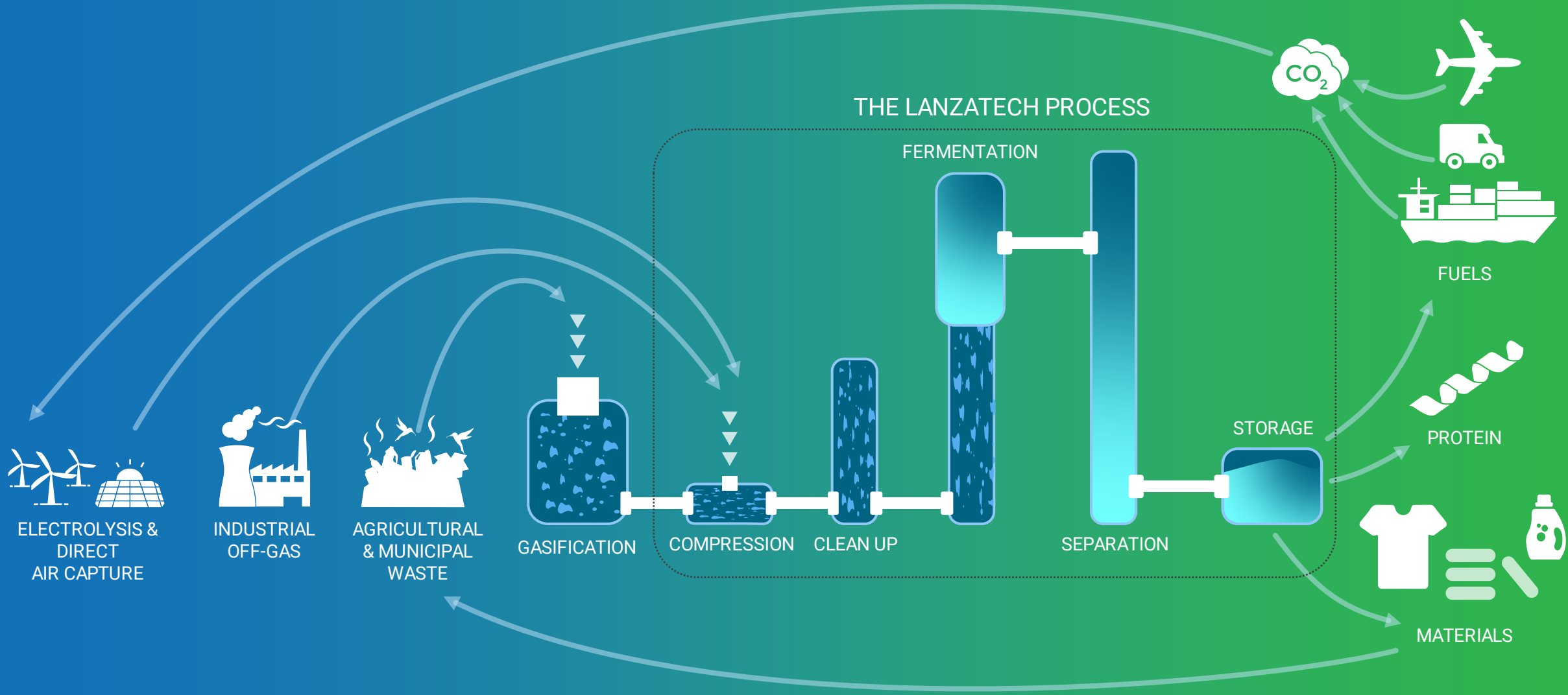


Energy Can Be Carbon Free

Chemicals & Fuels Need Carbon

Where That Carbon Comes From Will Define Our Climate Future

LanzaTech's Process




2

15+ Year Journey

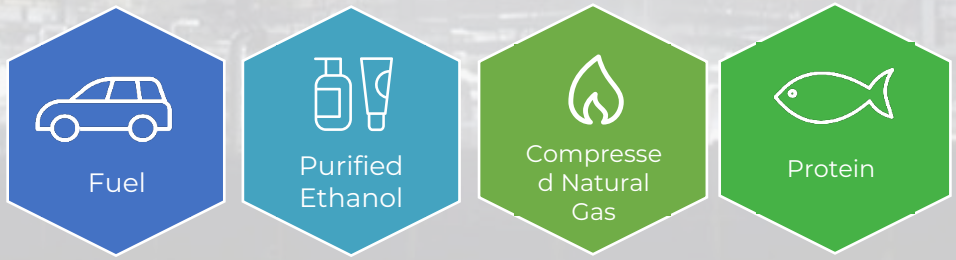
Laboratory 2005 | Pilot 2008 | Demonstration 2012

- ✓ Industrial emissions to ethanol
- ✓ Second commercial plant operating April 21

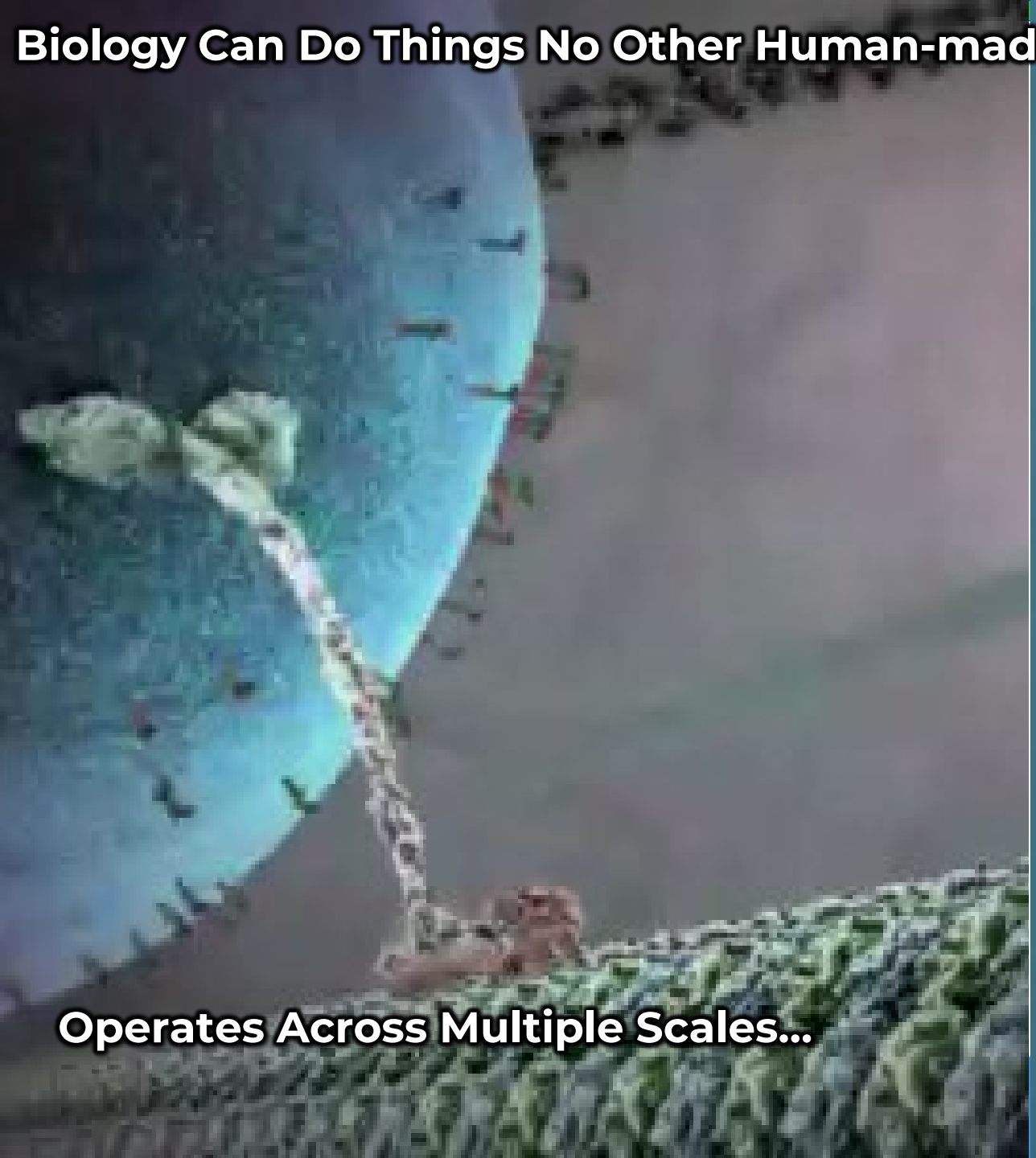
Commercial Scale 2018

RSB

>150,000 tons of carbon dioxide avoided



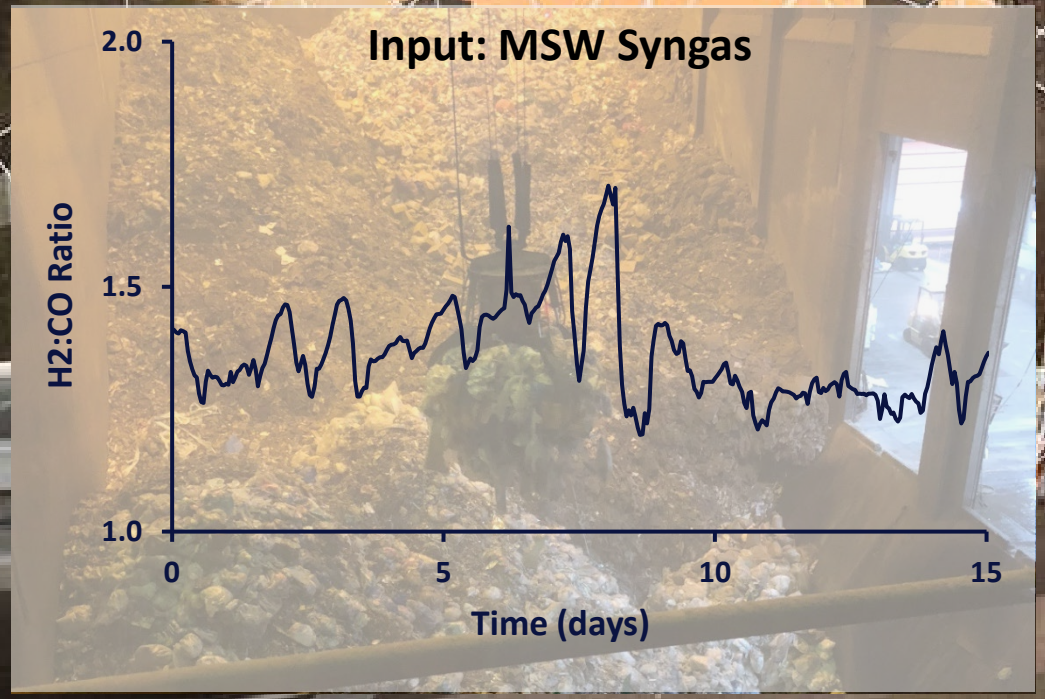
Biology Can Do Things No Other Human-made Technology Or Chemistry Can Do

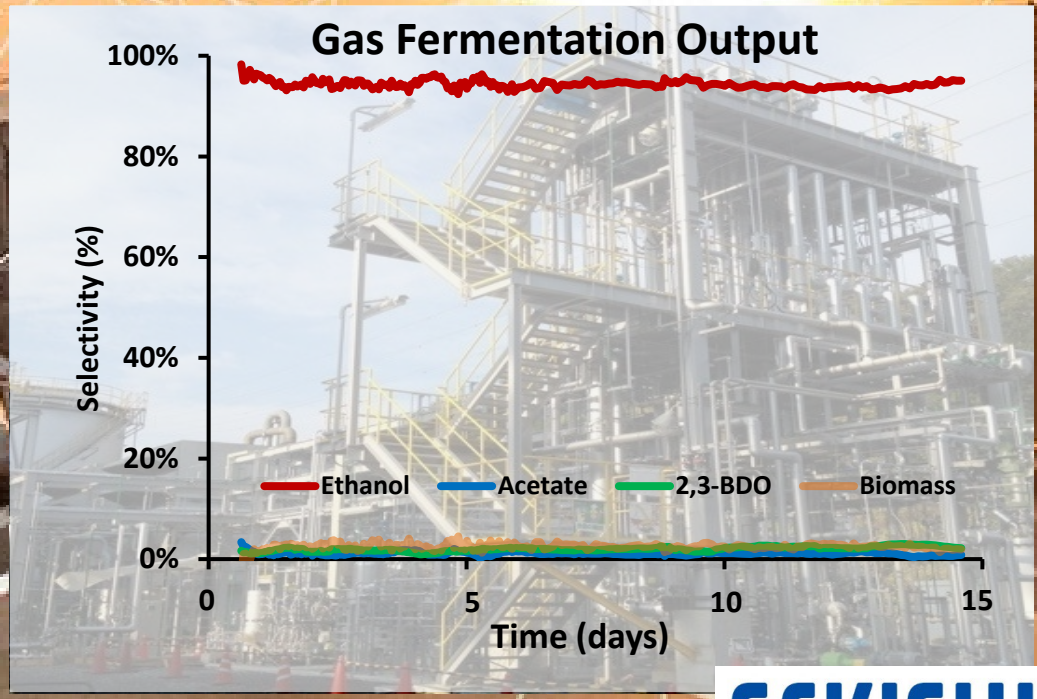


Operates Across Multiple Scales...

Self Replicates & Evolves Complex Function.

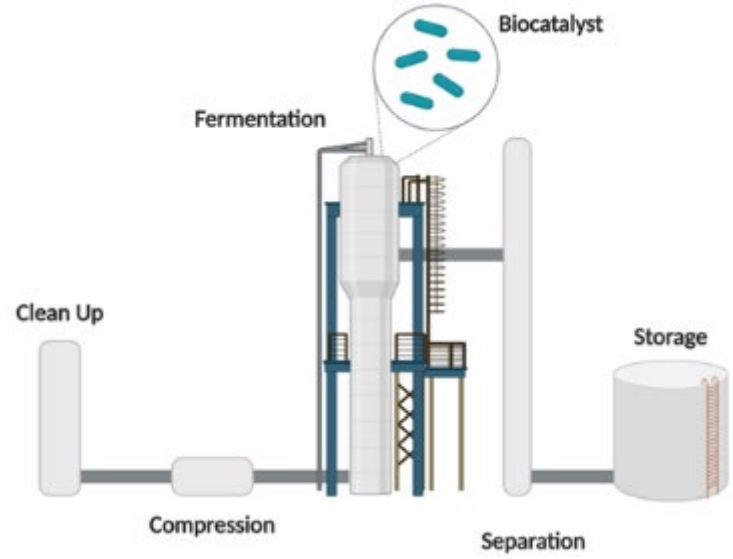
Biology Is Capable Of Processing Chaotic Inputs

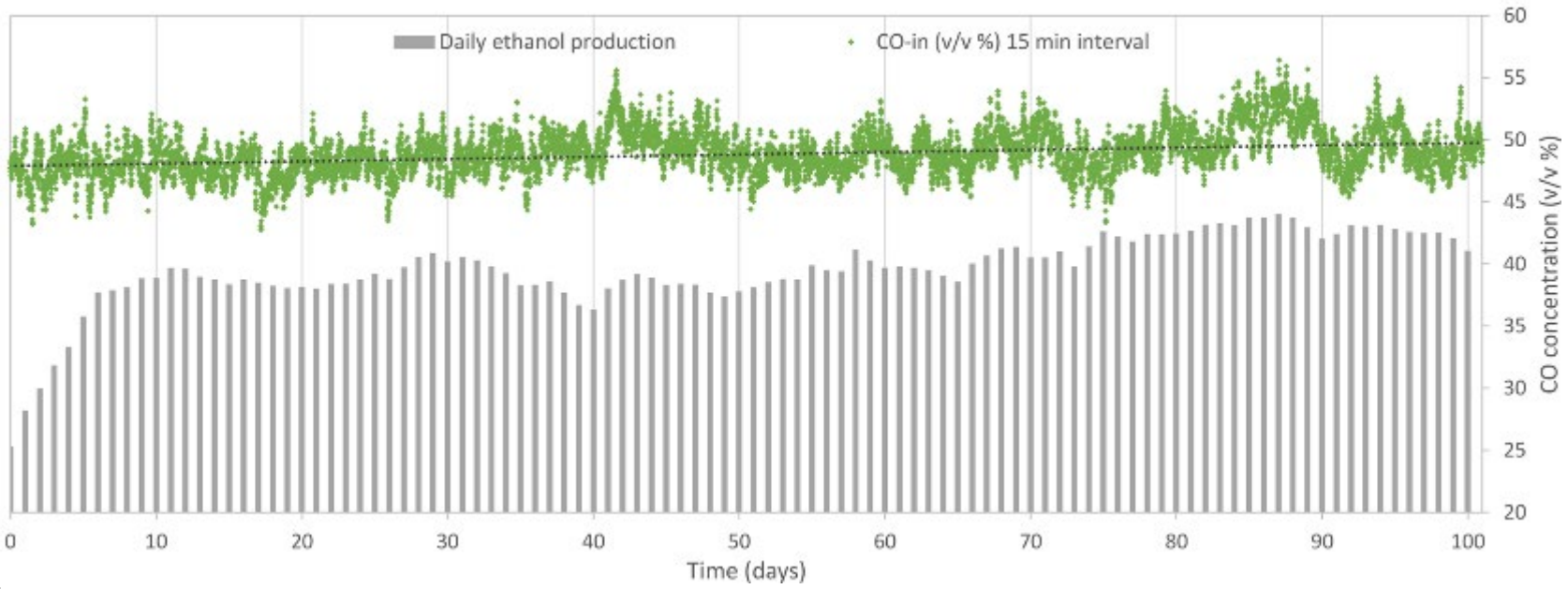




SEKISUI

2020: Continuous Operation





Commercial: Exceeding run length target

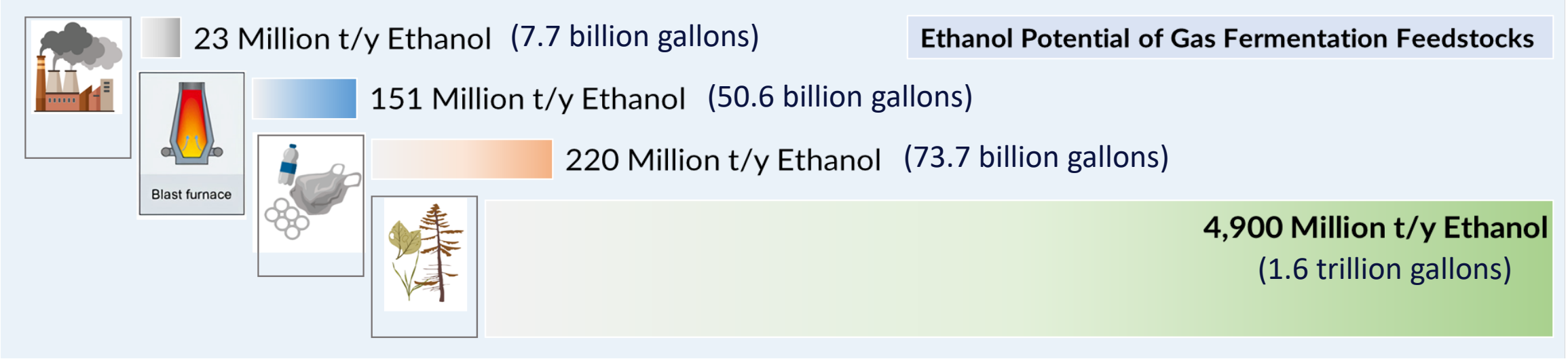
Added Hydrogen Increases Carbon Capture

		H_2:CO Ratio	Carbon Efficiency
CO	$6\ CO + 3\ H_2O \rightarrow C_2H_5OH + 4\ CO_2$	0:1	33.3%
CO + H_2	$3\ H_2 + 3\ CO \rightarrow C_2H_5OH + CO_2$	1:1	66.7%
CO + H_2	$4\ H_2 + 2\ CO \rightarrow C_2H_5OH + H_2O$	2:1	100%
CO + H_2 + CO_2	$5\ H_2 + 1\ CO + 1\ CO_2 \rightarrow C_2H_5OH + 2\ H_2O$	5:1	100%
H_2 + CO_2	$6\ H_2 + 2\ CO_2 \rightarrow C_2H_5OH + 3\ H_2O$	1:0	100%

Multiple avenues to reach 100% carbon capture

Gas fermentation can flexibly add green H_2 to tailor carbon capture

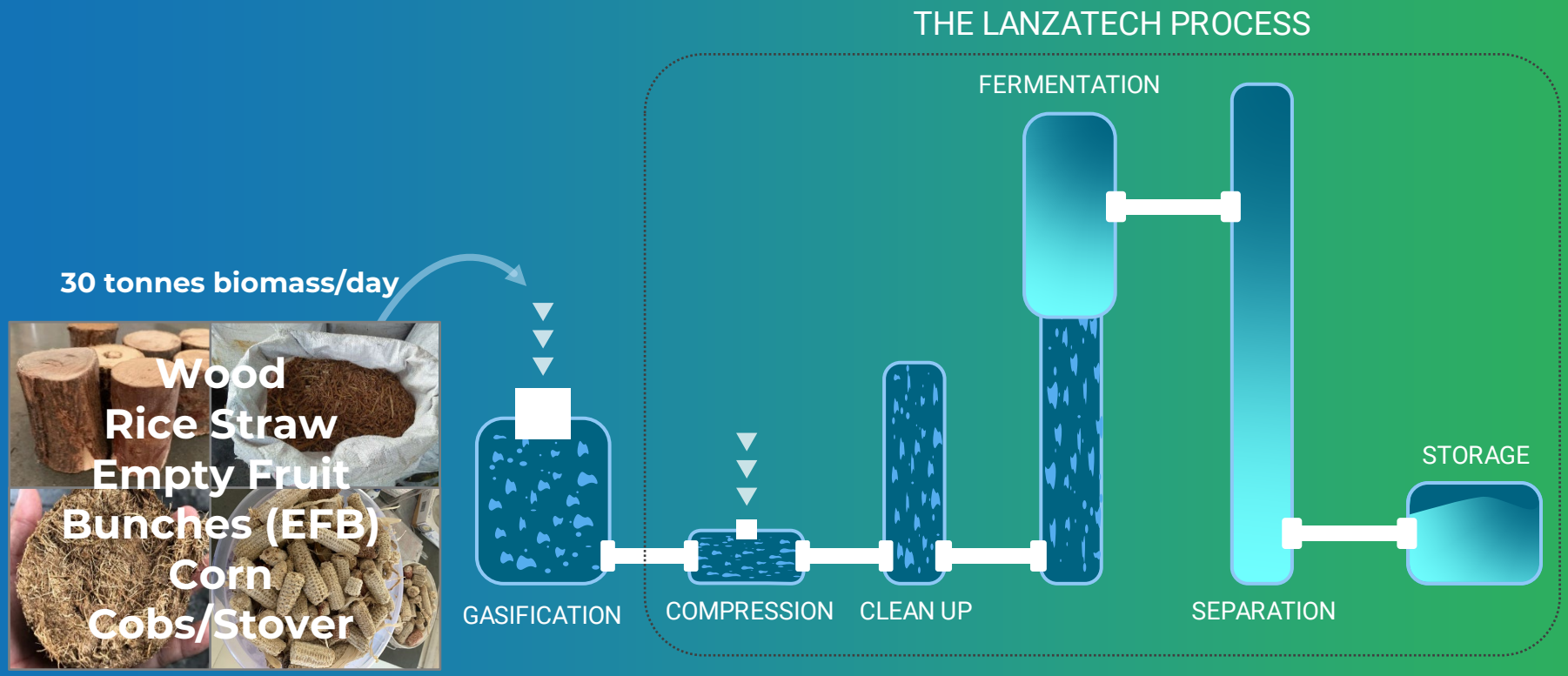
Importance of Solid Feedstocks in Getting to Scale



- Biomass and waste are very large potential feedstock sources for conversion to products
- Not all biomass feedstocks accessible, but 270 exajoules of biomass feedstock estimated to be available sustainably[1]
- Successful development of gasification and gas fermentation represents access to a plentiful feedstock not tied to fossil feedstocks

[1]Ladanai, S. & Vinterbäck, J., (2009) Global Potential of Sustainable Biomass for Energy, World Bioenergy p. 3

4000 Hours Operation: Integrated Biomass Plant, India



Variety of Feedstocks Successfully Demonstrated


Crop Residue
92M tonnes
burned annually
in Northern India

The MSW Opportunity

Landfill

- Costly
- Growing volumes: 4 B mt/yr by 2100[1]

Power

- <27% efficiency[1]
- Viable carbon-free power options

Carbon Recycle

- ~50% efficiency[2]
- Carbon in wastes produces high-value products

1. World Energy Council (2016); 2. Depending on type

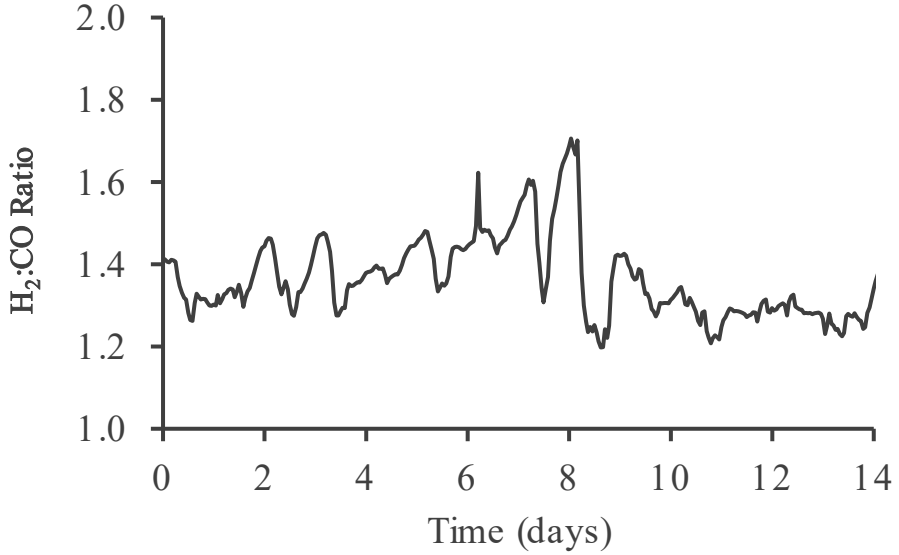
Partners since 2013

✓ **Unsorted MSW**

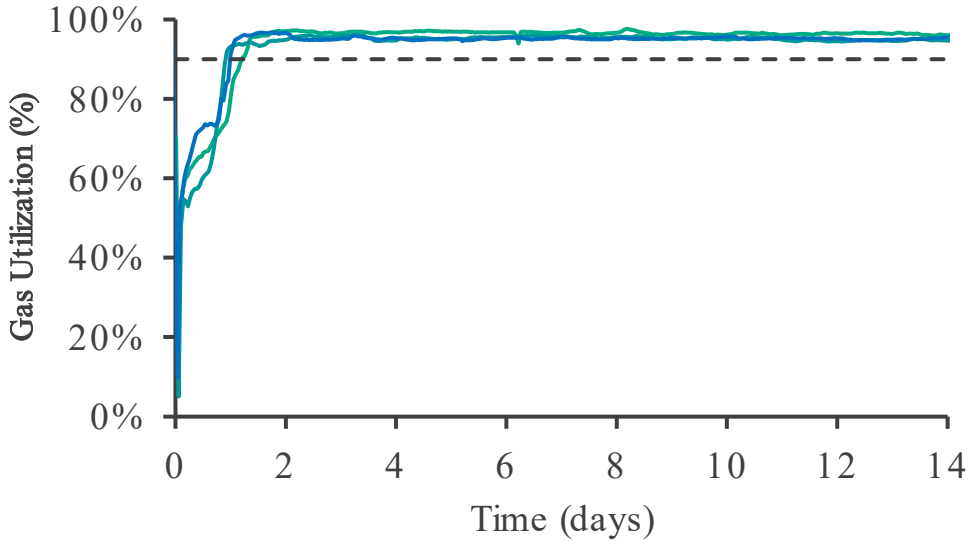
✓ **Gasified** ✓ **Fermented**

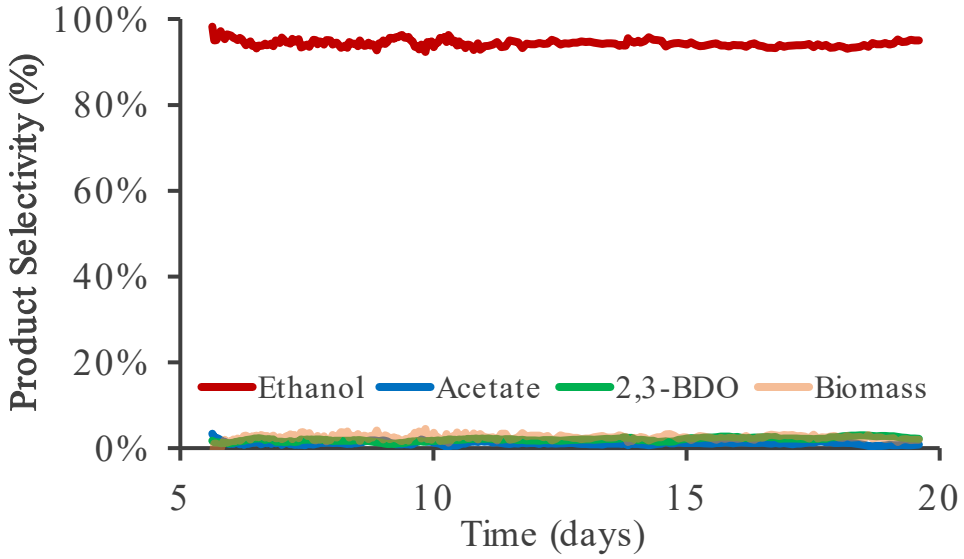
✓ **Stable Continuous Ethanol Production**

Sekisui-LanzaTech Pilot Plant Performance



- Process operates on syngas from heterogenous waste feed
  - Variable syngas composition which can uniquely be converted by gas fermentation
- Plant demonstrated 90% water recycle, reducing water makeup requirements

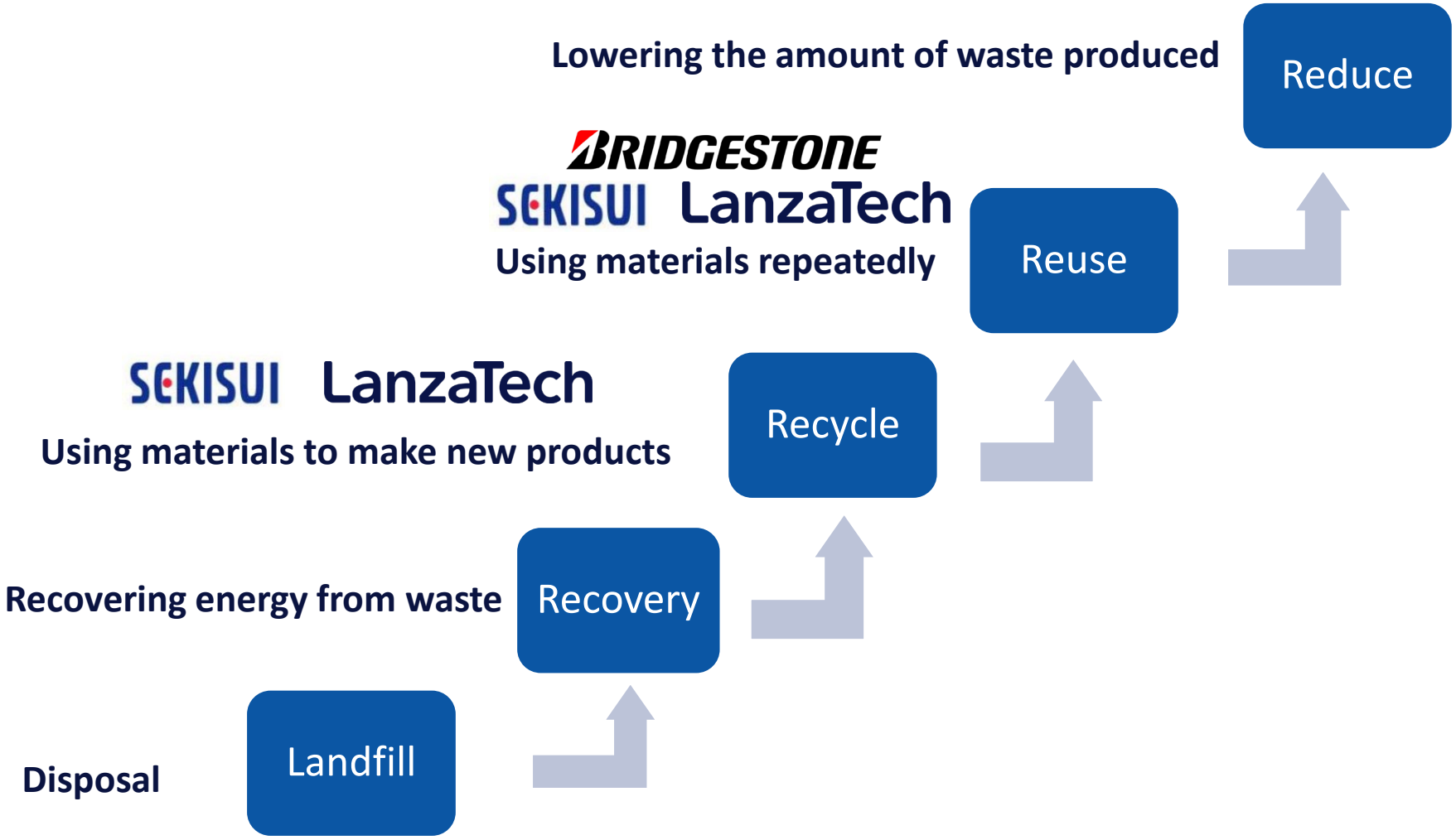




1/10 Plant Kuji

- Area: Approx. 25,000□ (including green area)
- Processing capacity: approx. 20t/day
- Production volume: 1 to 2 kL /day
- Production technology: Gasification reformer (Mitsubishi Heavy Industries Environmental & Chemical Engineering Co., Ltd.)
- Gas refining technology (SEKISUI CHEMICAL)
- Microbial biocatalyst and Gas Fermentation technology (LanzaTech, Inc.)

Embracing The Waste Hierarchy



Multiple Plants, Feedstocks and Products!

2 Commercial Plants Operating, 7 Plants Scheduled to Complete Construction in 2022, and 7 Additional Plants in Engineering

Operating

Construction

Engineering

Feedstocks Represented

Steel and Ferroalloy Gas | MSW | Refinery Gas | Biomass | Biogas

Regions Represented

North America | Europe | Asia | Oceania

Partner Investment

~$800 million

Estimated Total Installed Capacity[1]

~600,000 mtpa (200 million gpy)

Anticipated Carbon Captured Annually[1]

~1,000,000 tonnes

Source: LanzaTech management. [1] Represents capacity and carbon captured by all plants above.

Global Impact

Ethanol: A Starting Point for Multiple Pathways

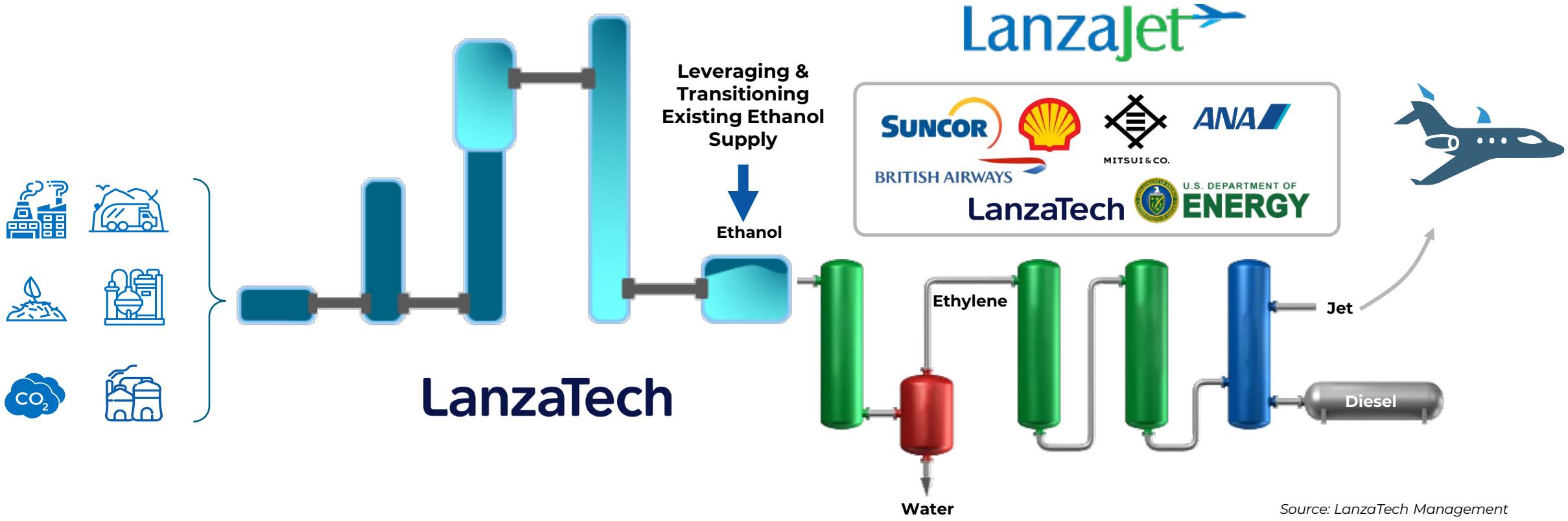
Building Block of the Future

Abundant, Waste-based Feedstock + **Low-Cost Process** = Competitive Waste-to-SAF Solution

With opportunity to utilize existing ethanol supply today

Pacific Northwest NATIONAL LABORATORY

U.S. DEPARTMENT OF ENERGY | Office of ENERGY EFFICIENCY & RENEWABLE ENERGY



Source: LanzaTech Management

Ethanol: A Starting Point for Multiple Pathways

Building Block of the Future

lululemon

Unilever

L'ORÉAL

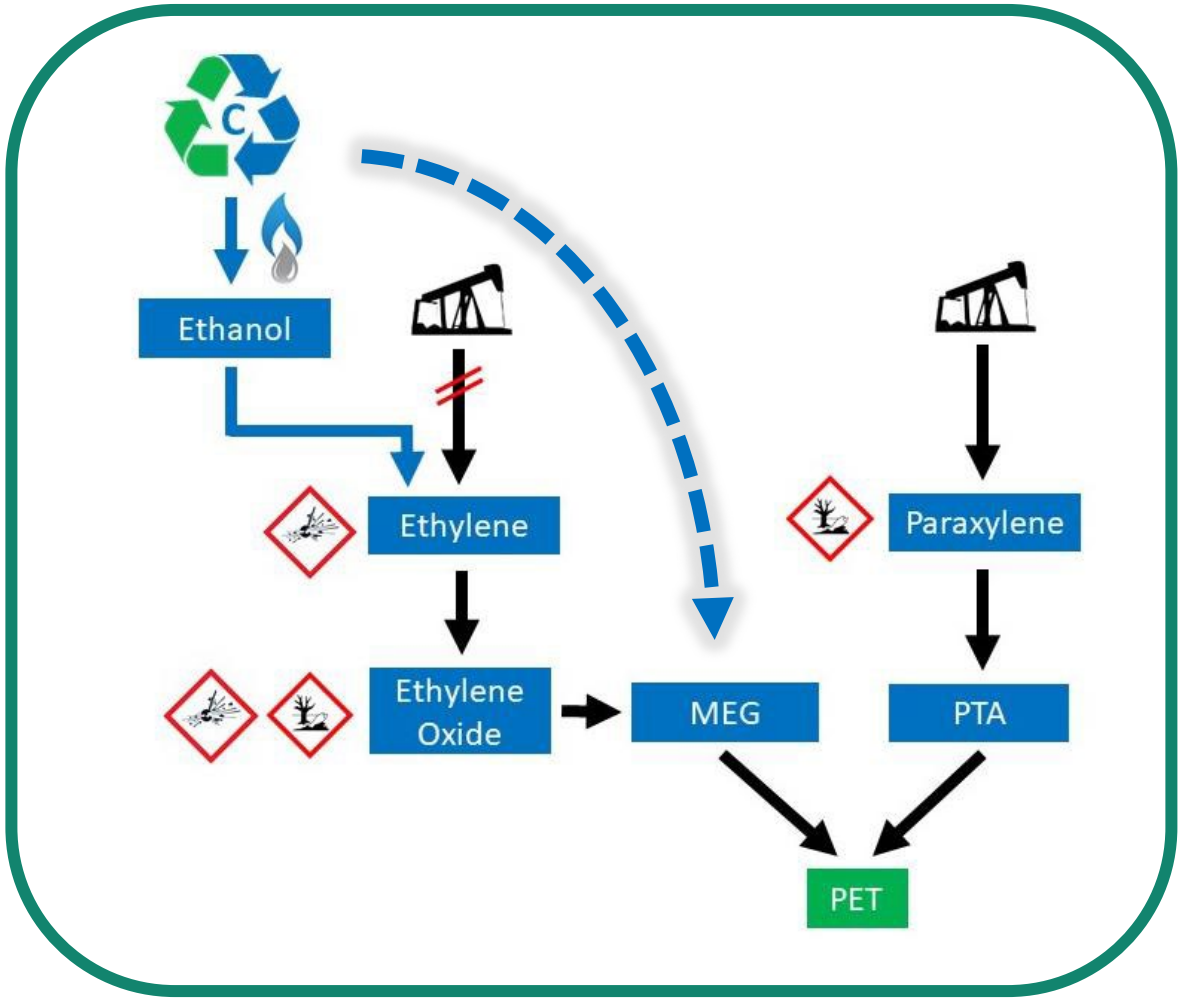
mibelle GROUP

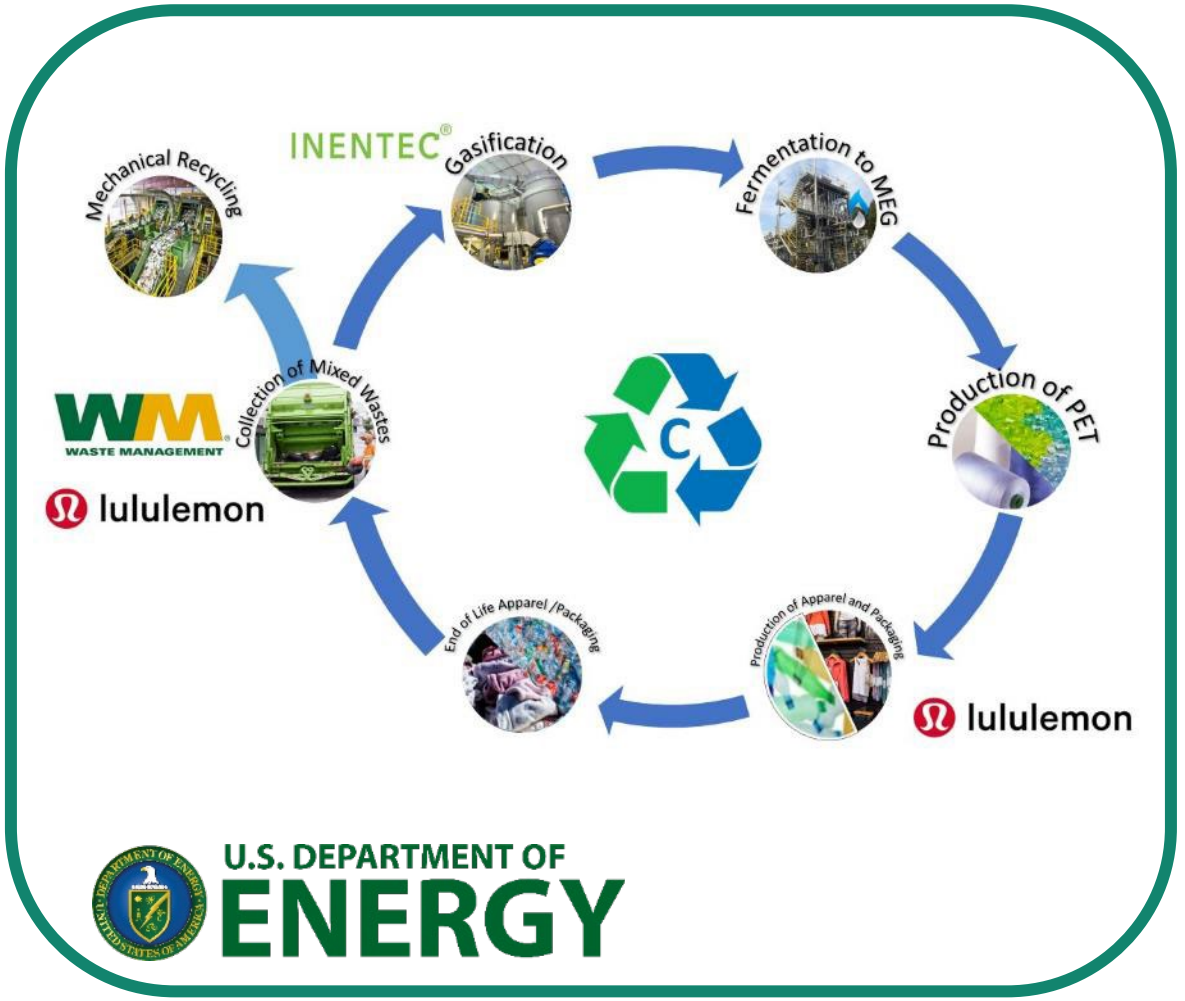
MIGROS

ZARA

dm

PET in the Circular Economy



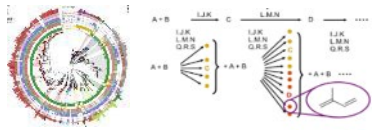


Programming Microbes

State-Of-The-Art Synthetic Biology Platform

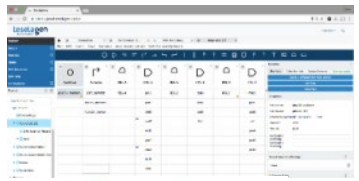
Discovery

- *Sequence/Knowledgebase*
- *Retrobiosynthesis*



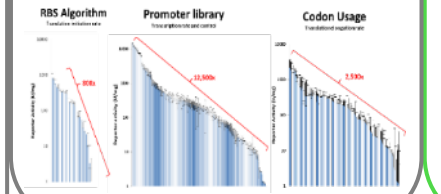
Computer-Aided Design

- *BioCAD*



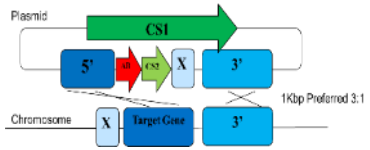
Genetic Parts

- *Reporters, Markers*
- *Promoters, Terminators*
- *RBS, Codon Usage algorithms*



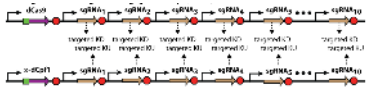
Genetic System

- *DNA transfer*
- *Modular plasmids*
- *Homologous recombination, CRISPR*



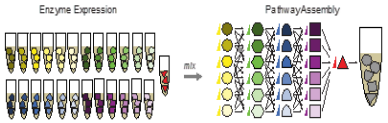
Advanced Toolbox

- *Multiplexing*
- *Genome-wide*
- *Genetic circuits*



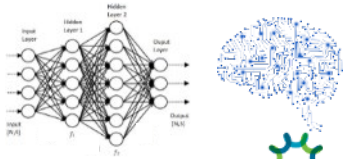
Rapid Prototyping

- *Cell-free protein synthesis*



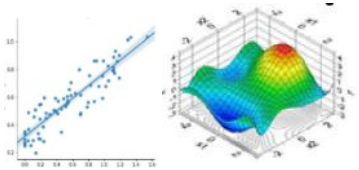
AI

- *Machine Learning*



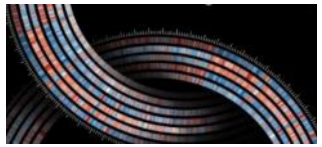
Modelling

- *Genome-scale*
- *Kinetic*
- *Technoeconomic*



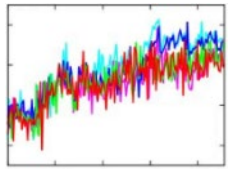
Systems Biology

- *Multi-Omics*
- *Enzymology*



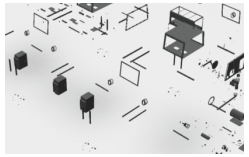
Automated Strain Evolution

- *Automated Strain Evolution*



Automated Strain Engineering

- *Anaerobic Biofoundry*



Miniaturization

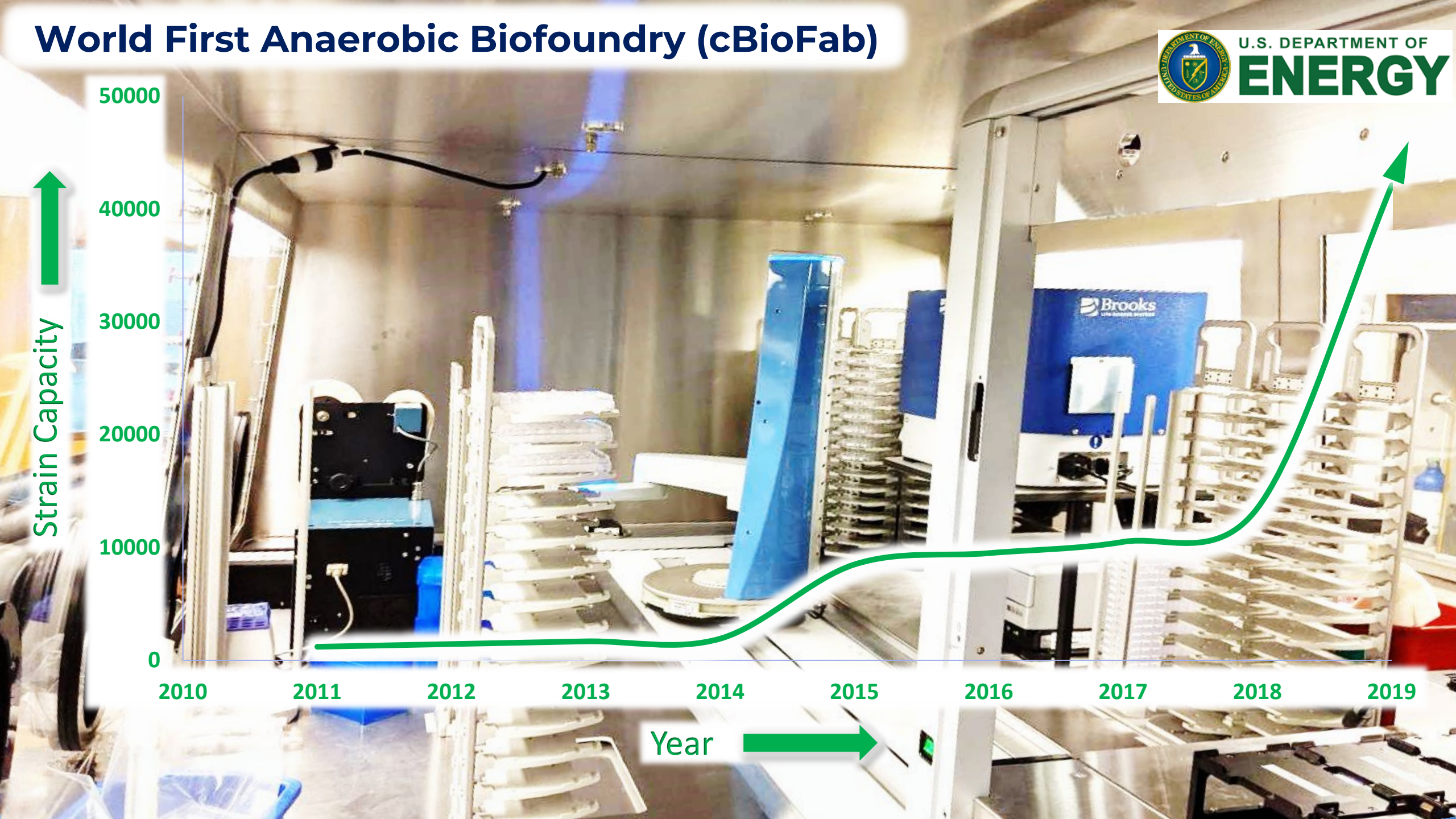
- *Microfluidics*

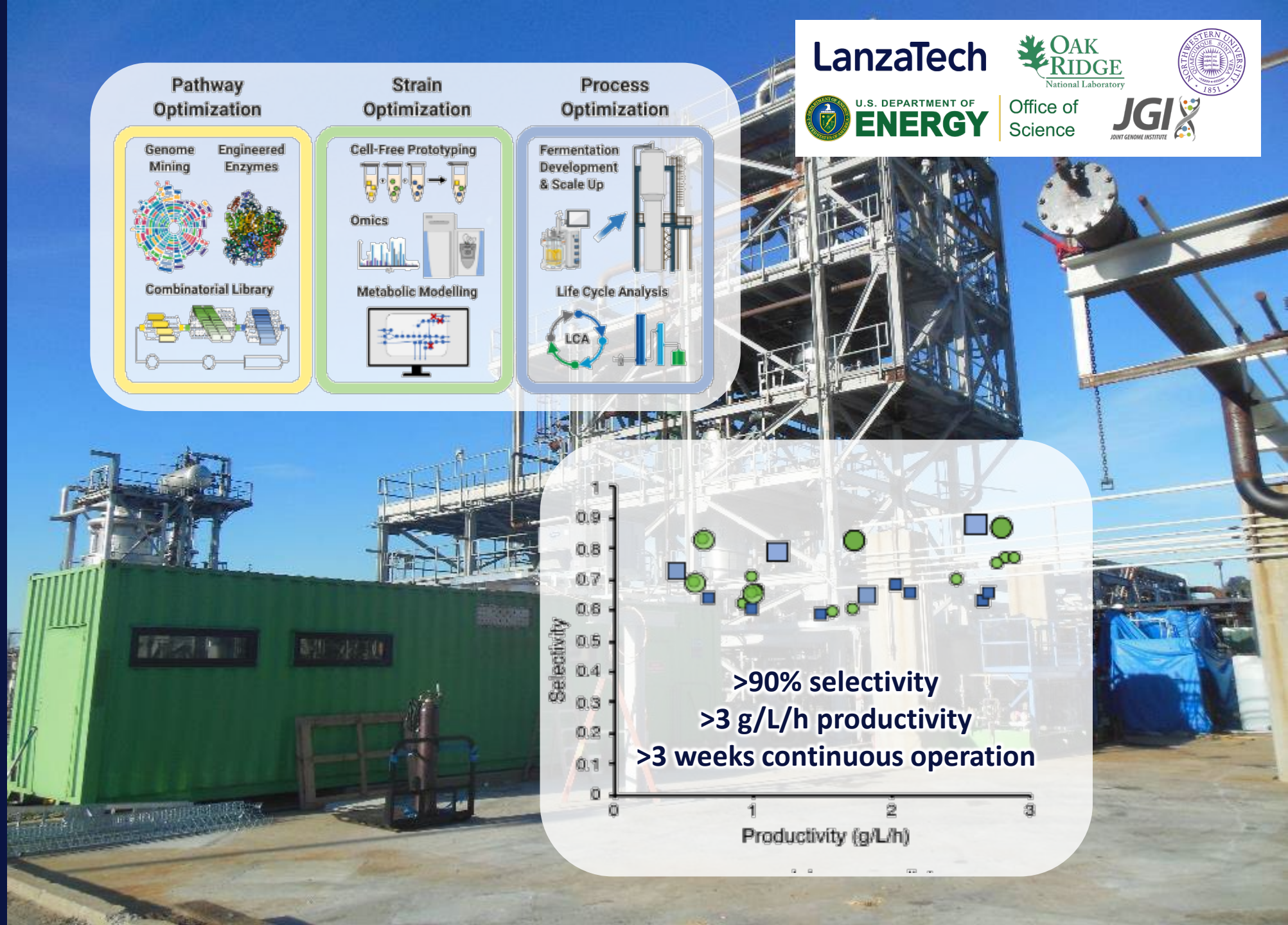
12 years ago, gas-fermenting acetogens were considered genetically inaccessible

Today, a suite of tools across the development cycle have been developed


HAMILTON

World First Anaerobic Biofoundry (cBioFab)




Pathway Optimization
Genome Mining
Engineered Enzymes
Combinatorial Library
Strain Optimization
Cell-Free Prototyping
Omics
Metabolic Modelling
Process Optimization
Fermentation Development & Scale Up
Life Cycle Analysis
LCA
LanzaTech
OAK RIDGE National Laboratory
U.S. DEPARTMENT OF ENERGY
Office of Science
JGI JOINT GENOME INSTITUTE
Selectivity
Productivity (g/L/h)
>90% selectivity
>3 g/L/h productivity
>3 weeks continuous operation

MEG

Acetone

IPA

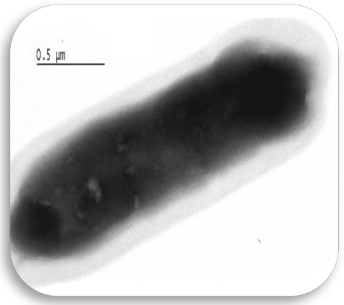
Direct Production Reduces Costs & Footprint

LanzaTech

What Do You Want to Make Today?

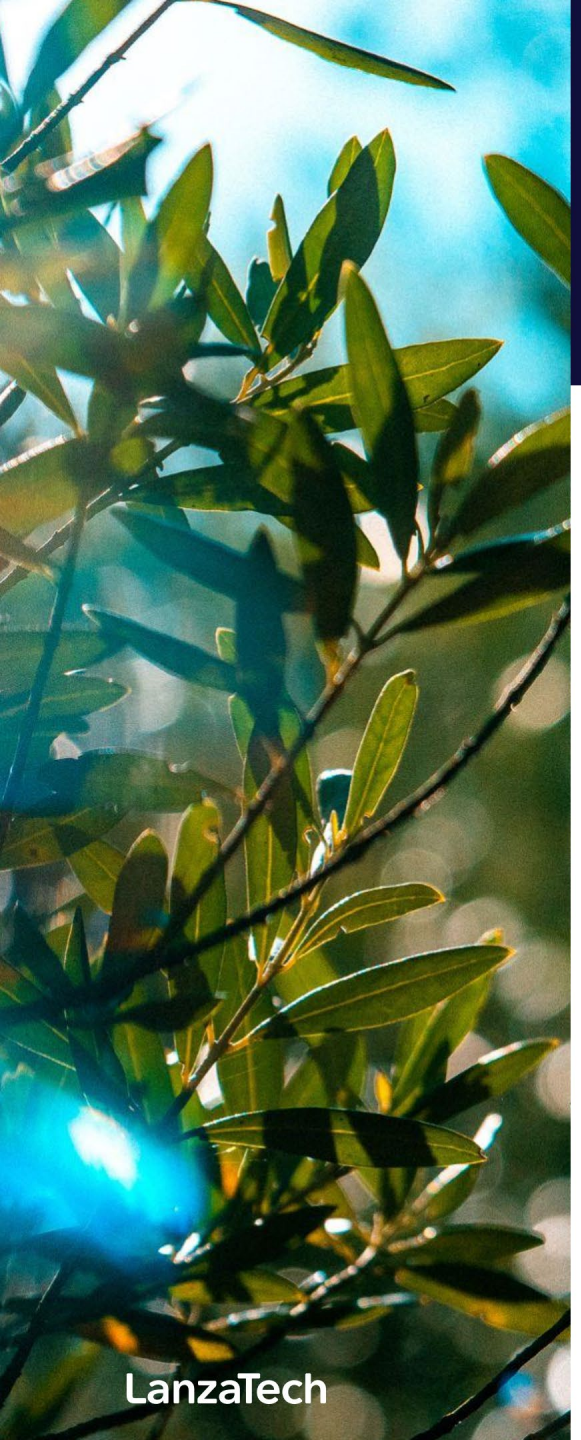
"hardware"

"software"

Microbe 1.0	Microbe 2.0	Microbe 3.0	Microbe 4.0	Microbe 5.0
				
✓Ethanol	✓Acetone	✓Isopropanol	✓MEG	✓Product X

DISRUPTION = 1) Rapid Reaction to Market Fluctuations 2) Feedstock ≠ Commodity

✓Same reactor ✓Same operating conditions ✓Same feedstock



IPCC Report: Now or Never

43% GHG Emissions must be **reduced** by this much by 2025

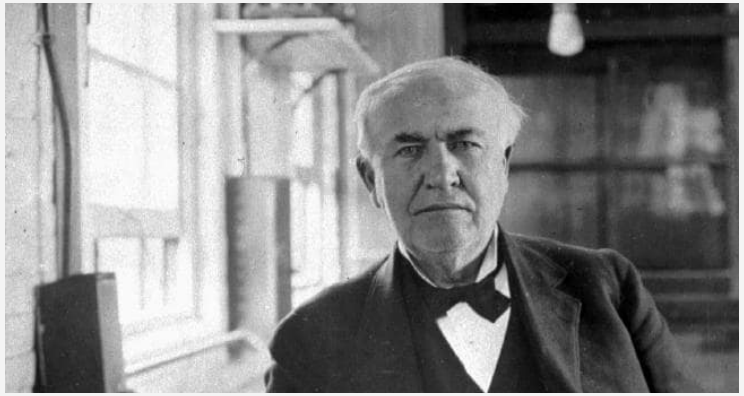
14% Current climate pledges would mean an **increase** by this much. And most emitters are not taking steps to fulfil these pledges.

3°C Current policies put us on track for a central estimate of this temperature rise by 2100. But climate system uncertainties mean a warming of as low as 2.3C or above 4C can't be ruled out.

99% Nearly all scenarios that limit warming below 2C rely on some degree of CDR to accelerate the pace of emissions reductions, to offset residual emissions, and to provide the option for net negative CO_2 emissions in case global temperatures need to be brought back down.

“We should not make our vision just different layers of climate tragedy.”

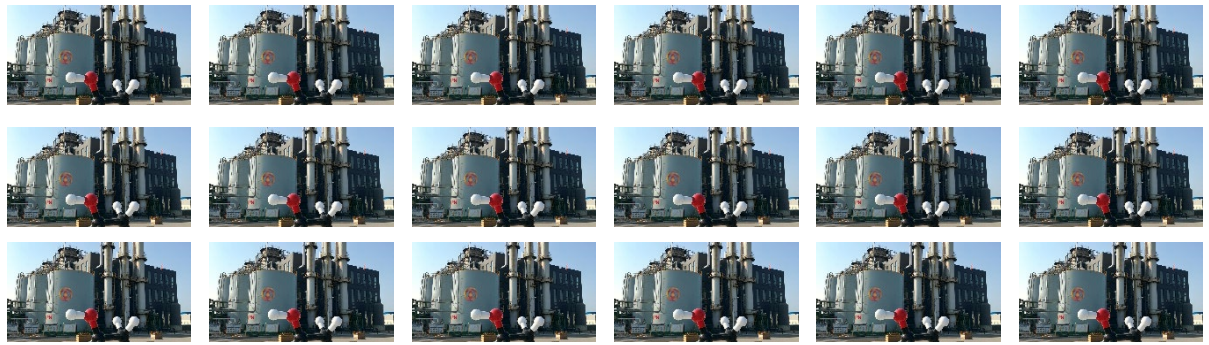
Tom Chi



New technologies shape our belief of what's possible and drive rapid transformation

Scaling Up

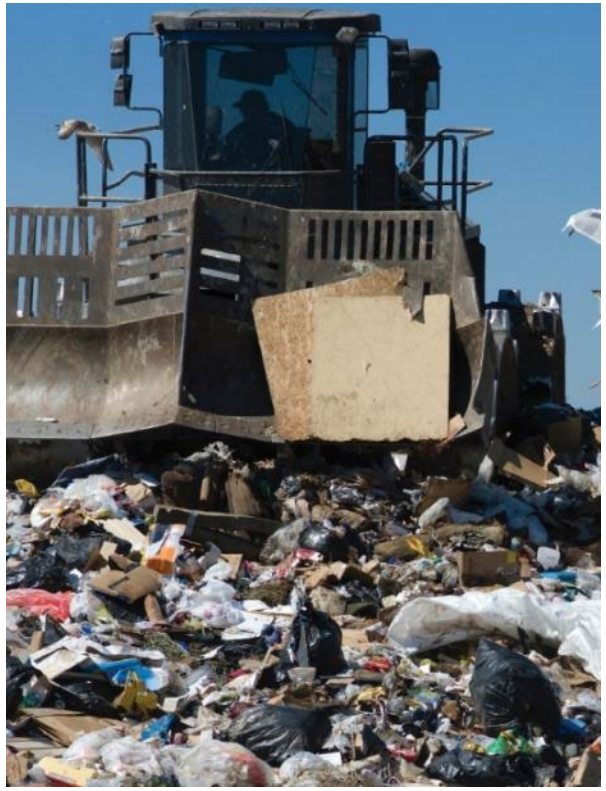
Numbering Up



“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”

Buckminster Fuller



Every waste resource

Including CO_2


Can become the things
we use in our daily lives

Multiple Solutions. All Needed.

MECHANICAL

THERMOCHEMICAL

CHEMICAL

BIOCHEMICAL

Biological sugar upgrading

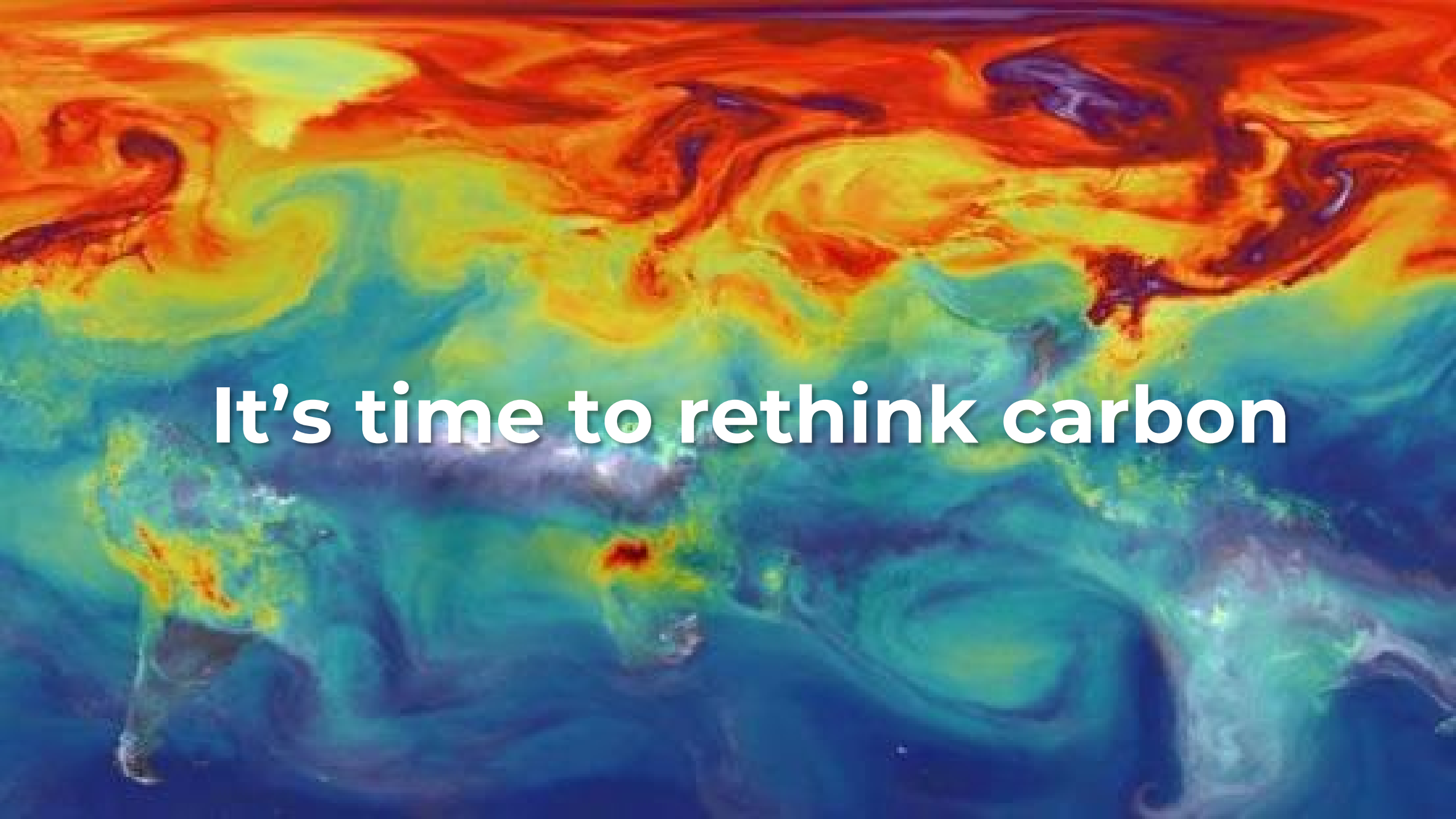
Catalytic conversion of sugars

Gasification

Pyrolysis

Hydrothermal processing

LanzaTech


It’s time to rethink carbon


Rethink refining


The first cosmetic plastic bottle made from industrial carbon emissions.
L'ORÉAL
OMO
BORN TO RECYCLE
NO CARBON LEFT BEHIND

“It always seems
impossible until it's done.”

Nelson Mandela

Welcome to the Post Pollution Future

LanzaTech