Sustainable Solutions to Global Energy Challenges

Carl Wolf
Business Development Manager

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LanzaTech

Company Profile

LanzaTech

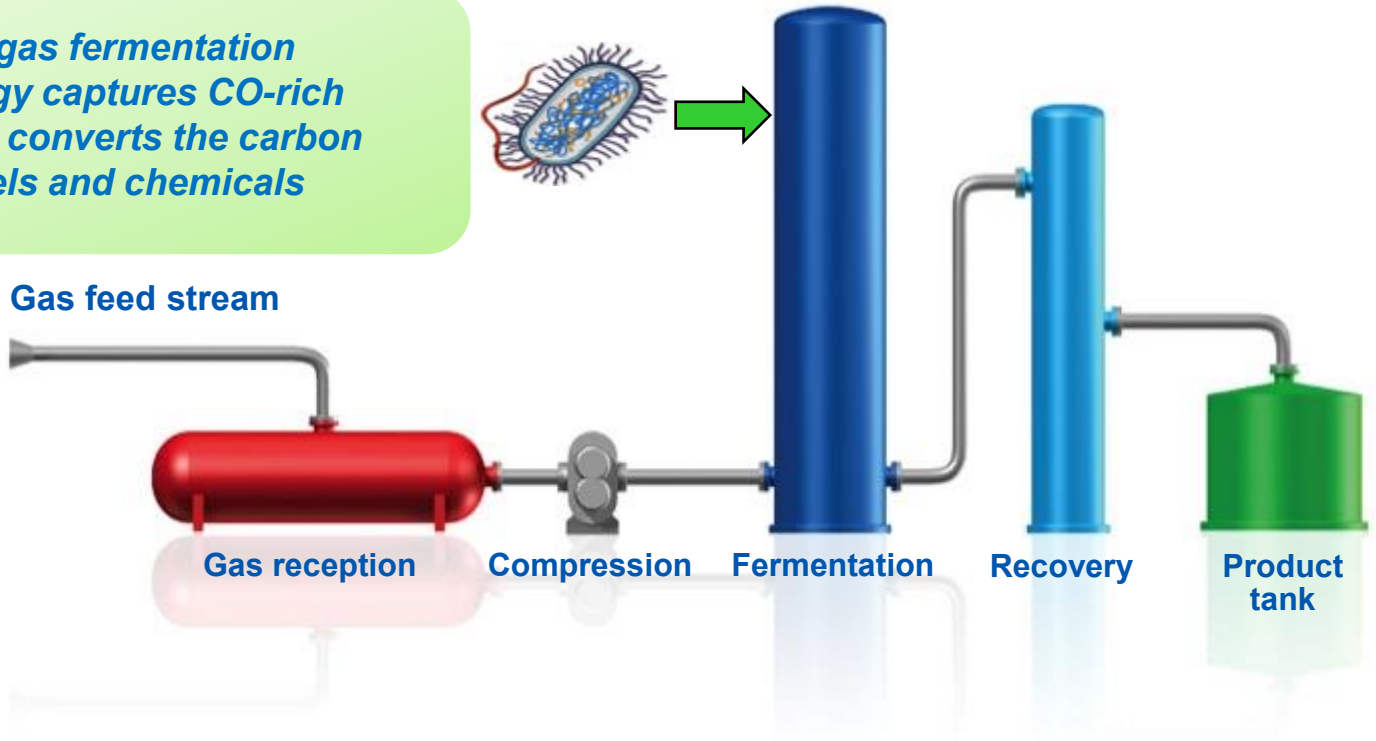
- **Founded in January 2005**
- **Corporate Headquarters in Chicago, IL, R&D in New Zealand, Operations and BD office in China and India**
- **Funding**
  - Series A: Khosla Ventures - $US 12M in 2007
  - Series B: Qiming Ventures - $US 18M in 2010
  - Series C: Burrill MLSF - **$US 60M in 2012 equity, $US 15M debt WTI**
- **Team**

  CEO: Dr. Jennifer Holmgren

  CSO/Founder: Dr. Sean Simpson
  - Over 145 staff
    - Synthetic Biology
    - Analytical
    - Engineering
- **IP Portfolio**
  - **42 patents granted, 228 patents pending**
  - **2 proprietary microbe families**
  - **12 synthetic biology families**

The LanzaTech Process

Novel gas fermentation technology captures CO-rich gases and converts the carbon into fuels and chemicals



- Naturally occurring organism transforms waste resources
- Completely outside of the food value chain
- Production of fuels and chemicals
- Potential to make material impact on the future energy pool (>100s of billions of gallons per year)

What We Need in Order to Execute

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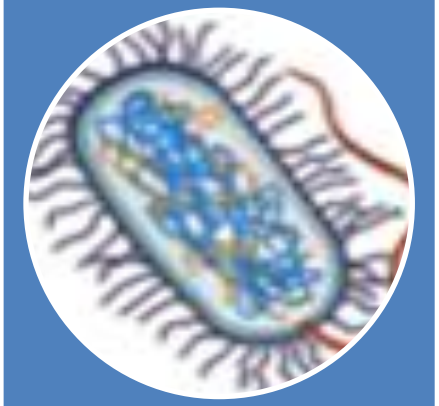
Low cost, abundant resource's



Technology

End user/market (off-take)

Financing

It's difficult to do this all by ourselves!

Global Partnerships

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Completing the Supply Chain

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Upstream	Midstream and Downstream	End Users/Markets

posco
BAOSTEEL
首钢集团 SHOUGANG GROUP
BLUESCOPE STEEL
HARSCO
CHINASTEEL
JINDAL STEEL & POWER
IndianOil
PETRONAS
HNCC
WWW.YKJT.CN
Freedom Pines Biorefinery

MichiganTech
SIEMENS VAI
Global Bioenergies
Swedish BioFuels
LanzaTech
PETRONAS
INVISTA
NREL
Pacific Northwest NATIONAL LABORATORY


virgin atlantic

INVISTA
BOEING
PETRONAS
Mitsui


IndianOil
LCY


- ✓ *Position as a technology solution to reduce industrial intensity*
- ✓ *Establish partnerships to solve technical challenges*
- ✓ *Support optionality to upstream resources and downstream product suite*

Input: Broad Feedstock Options

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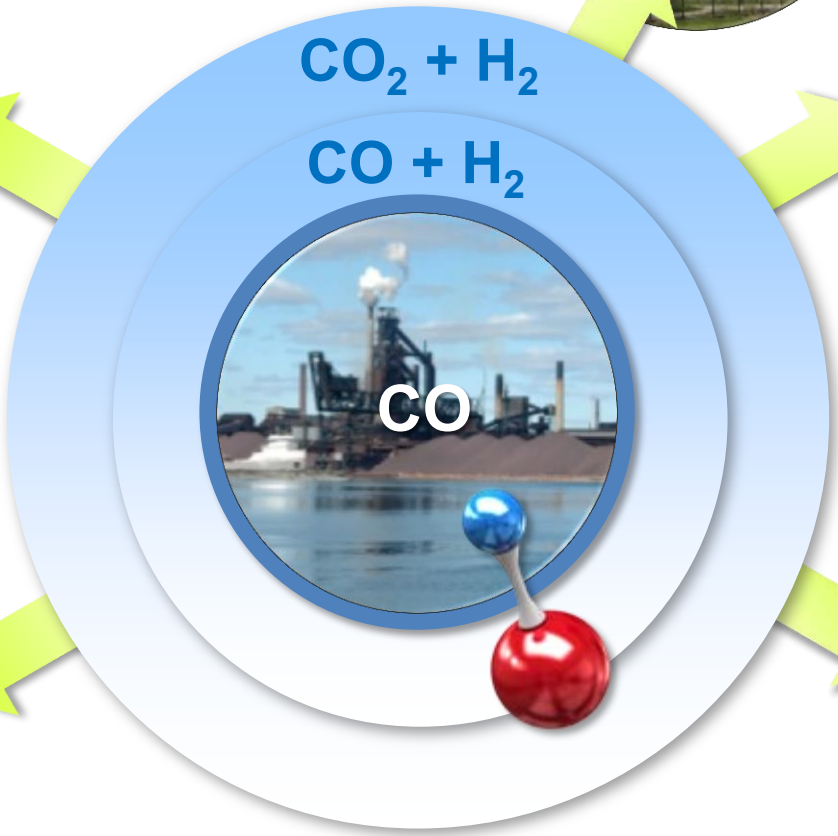
~90M MTA

>2B MTA



3300B M^3

>1B MTA US Alone

*2010 production data – IEA, UNEP

Output: Diverse Products in Large Markets

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~1.7M bpd

~4 M MTA

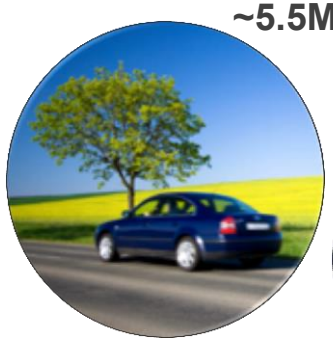
~50 M MTA

Ethanol

Butanol
Butanediol
Propanol

Hydrocarbon
Fuels

~5.5M bpd



~51M bpd

~8.5M bpd

*2010 global consumption data - Harts, IEA

Commercialization of Aviation Fuel

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BOEING

Imperial College of London

RSB
ROUNDTABLE ON SUSTAINABLE BIOFUELS

Swedish BioFuels

virgin atlantic

Team Work is Key to Success

INVISTA Partnership

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INVISTA™

INVISTA is one of the world's largest integrated producers of polymers and fibers, primarily for nylon, spandex and polyester applications.

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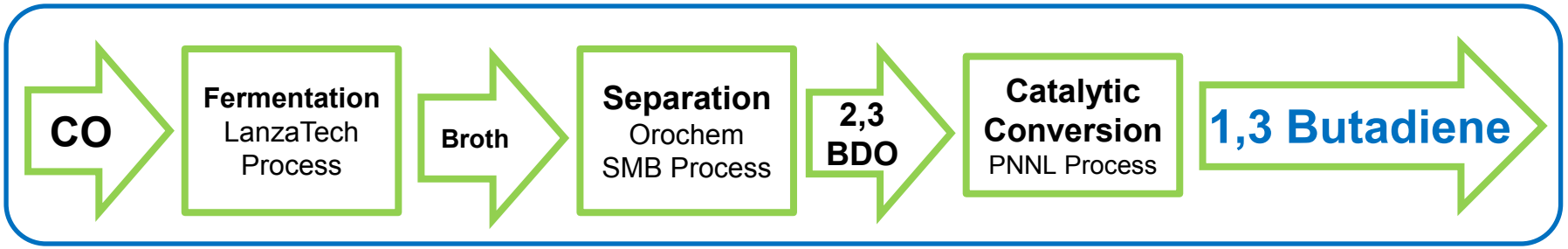
Pacific Northwest NATIONAL LABORATORY



INVISTA and LanzaTech have established a strategic partnership to:

1. Develop a Two Step process to produce 1,3 Butadiene
2. Develop an alternate Direct single step route to 1,3 Butadiene

Capturing Carbon as Lipid

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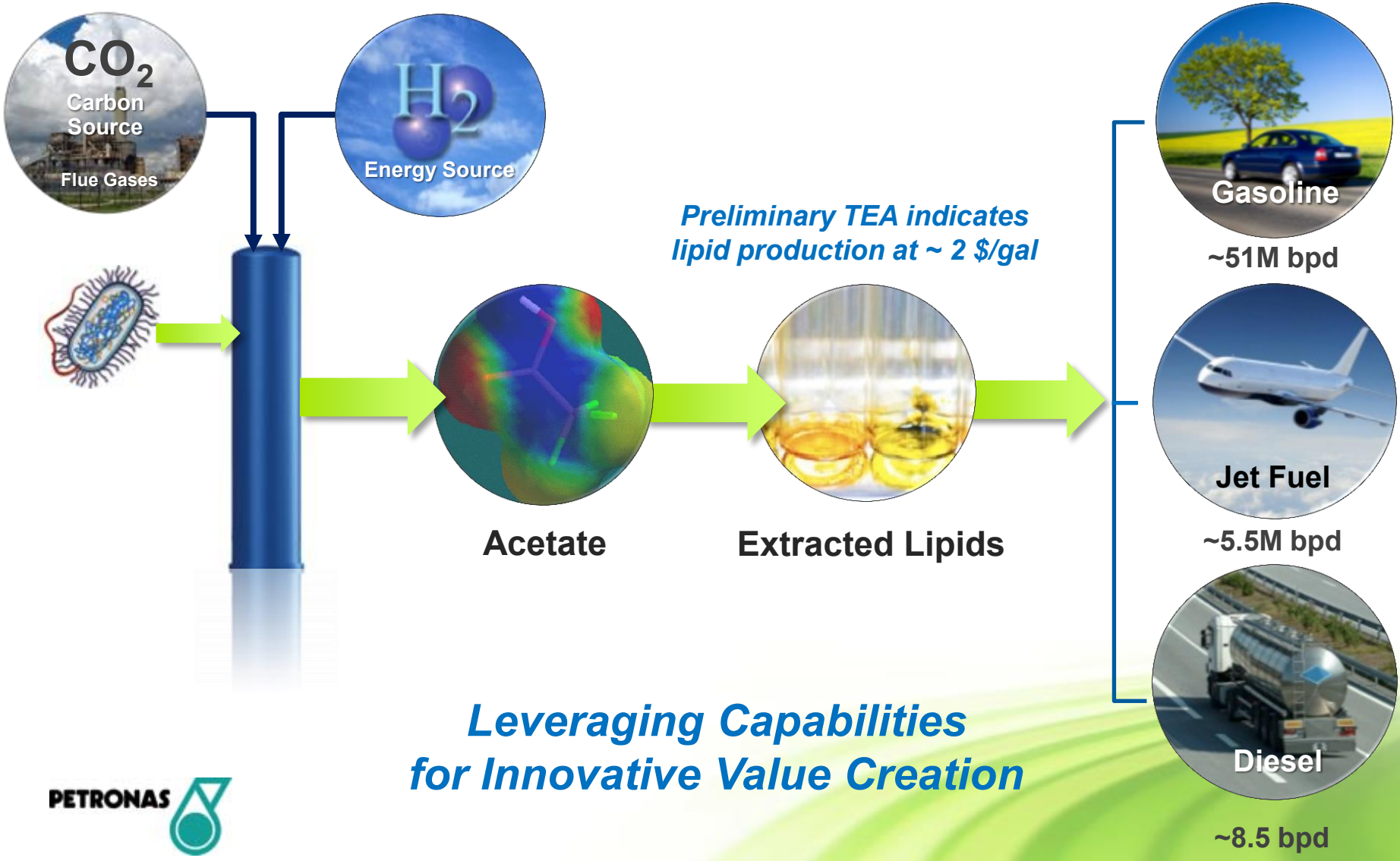

Leveraging Capabilities for Innovative Value Creation

PETRONAS

A Hybrid Catalytic Route to Fuels from Biomass Syngas

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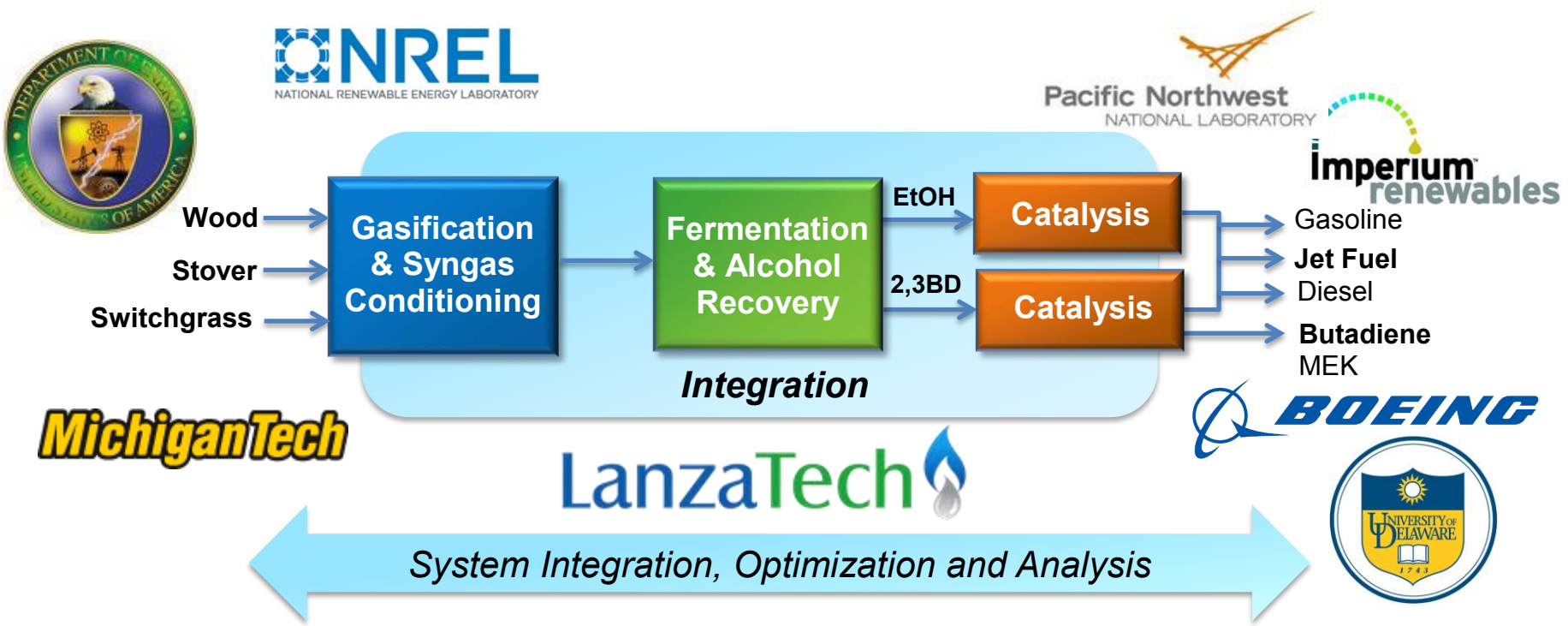

Improve Economics and Process Sustainability

Fast Path to Commercial Scale

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LanzaTech BAOSTEEL

- Pre-commercial facility in operation in Shanghai for >8 months meeting and exceeding all its performance targets and milestones
- Capacity 100,000 gallon/year ethanol
- Demo has been approved in China for commercial deployment, by the NDRC

LanzaTech 首钢集团 SHOUGANG GROUP

- Operation of additional 100,000 gallon/year plant with second Chinese Partner, Shougang Group, in Beijing

Ready for Commercialization

Co-locating LanzaTech's Technology Steel Mill brownfield sites reduces land footprint, improves economics and reduces construction time

Global Recognition

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2013

Forbes

LanzaTech named in Top 50 most promising companies in Forbes 2013 annual list

kea
New Zealand's Global Talent Community

Sean Simpson named this year's World Class New Zealander for Science, Technology and Academia.
KEA honours internationally successful Kiwis, who have greatly contributed to the country's reputation and connectedness on the world stage.

BioSpectrum
the business of bioscience

Sean Simpson, named BioSpectrum Asia-Pacific Entrepreneur of the Year.

2012

BiofuelsDigest
The world's most widely read biofuels daily

- *LanzaTech was ranked 3rd in the 50 Hottest Companies in Bioenergy*
- *LanzaTech was ranked 7th in the 30 Hottest Companies in Renewable Chemicals*

Global Cleantech 100

LanzaTech has been named to the 2012 Global Cleantech 100. One of the companies best positioned to solve tomorrow's clean technology challenges

NEW ENERGY PIONEER 2012
Bloomberg NEW ENERGY FINANCE
WINNER

LanzaTech has been selected as a 2012 Bloomberg New Energy Pioneer, recognized as a world-leader in energy innovation

WORLD ECONOMIC FORUM
Technology Pioneer 2013

LanzaTech Named a World Economic Forum Technology Pioneer 2013

One of 23 companies globally with promise of "significantly impacting the way business and society operate."

tr50

MIT technology review

LanzaTech has been named one of the 50 most innovative companies in the world

AlwaysOn
GOINGGREEN
GGSV 200 WINNER

LanzaTech has been chosen by AlwaysOn as one of the GoingGreen Silicon Valley Global 200 winners

Award signifies leadership amongst its peers and game-changing approaches and technologies that are likely to disrupt existing and entrenched players in green technology.

TiE50 2012 WINNER

LanzaTech Named TiE50 Winner for Entrepreneurship Excellence

Global sustainable fuel and chemical company receives recognition for second year running

Capturing Carbon, Fueling Growth

LanzaTech

- **Highly differentiated technology** – gas fermentation with greatest feedstock, end-product flexibility
- **Meets survival-driven demand in big markets** – partners with waste gases, end-products in $XB+ markets
- **Proven at demonstration scale** – 100,000 gpy demo achieved milestones in Dec 2012
- **Compelling production economics** – targeting cost parity, beneficiary of low feedstock cost
- **World-class team** – global experience in technology commercialization

Promote Resource Efficiency

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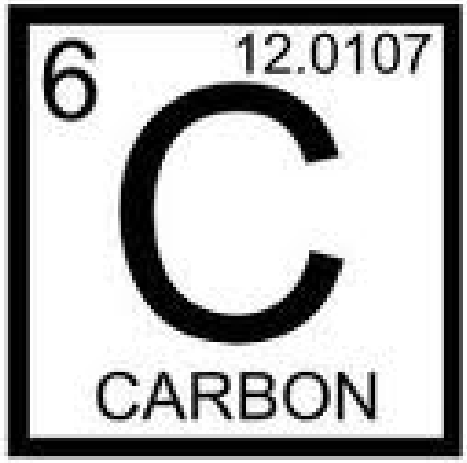
Energy can be Carbon free

Wind:

Solar:

Hydro:

- **Liquid fuels & Petrochemicals** must contain:



….. It just makes more sense

A INNOV TION

the Game Changer...