Company Profile

• Founded in January 2005

• Corporate Headquarters in Chicago, IL, R&D in New Zealand, Operations and BD office in China and India

• Funding
  – Series B: Qiming Ventures - $US 18M in 2010

• 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

- 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

It’s difficult to do this all by ourselves!

Low cost, abundant resource’s
Technology
End user/market (off-take)
Financing
Global Partnerships
Completing the Supply Chain

- 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

- Pet Coke
  - ~90M MTA

- Natural Gas
  - 3300B M³

- Flue Gases
  - >2B MTA

- Municipal Waste
  - >1B MTA US Alone

- Biomass
  - >1B MTA US Alone

CO₂ + H₂
CO + H₂

*2010 production data – IEA, UNEP
Output: Diverse Products in Large Markets

Hydrocarbon Fuels

- Ethanol: ~1.7M bpd
- Butanol: ~8.5M bpd
- Butanediol: ~4 M MTA
- Propanol: ~51M bpd

Ethanol

*2010 global consumption data - Harts, IEA
Team Work is Key to Success
INVISTA Partnership

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

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

**CO₂**
Carbon Source
Flue Gases

**H₂**
Energy Source

Leveraging Capabilities for Innovative Value Creation

\[ \text{Preliminary TEA indicates lipid production at } \sim 2 \text{ $/gal} \]

**Acetate**

**Extracted Lipids**

- **Gasoline**
  - \( \sim 51 \text{ M bpd} \)

- **Jet Fuel**
  - \( \sim 5.5 \text{ M bpd} \)

- **Diesel**
  - \( \sim 8.5 \text{ bpd} \)
A Hybrid Catalytic Route to Fuels from Biomass Syngas

System Integration, Optimization and Analysis

Improve Economics and Process Sustainability
Fast Path to Commercial Scale

- 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

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

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

LanzaTech has been named one of the 50 most innovative companies in the world by MIT Technology Review.

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.”

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.

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

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.
• **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

**Energy** can be Carbon free

- Wind:
- Solar:
- Hydro:

- Liquid fuels & Petrochemicals must contain:

…… *It just makes more sense*
A\n
INNOVATION

the Game Changer...