



**LanzaTech** 

capturing carbon. fueling growth.

<b>CEO:</b>	Dr. Jennifer Holmgren
<b>Board of Directors:</b>	Andrew Chung, Datuk (Dr.) Abdul Rahim Hashim, Dr. Jennifer Holmgren, Jim Messina, Gary Rieschel, Dr. Sean Simpson, Toru Ryoso, Dr. Roger Wyse
<b>140+ Staff Globally:</b>	HQ: Chicago, Illinois USA Offices in: Auckland, New Zealand; Shanghai, China; New Delhi, India; and Soperton, USA
<b>Series A:</b>	US \$12M
<b>Series B:</b>	US \$18M
<b>Series C:</b>	US \$60M, US \$15M debt
<b>Series D:</b>	US \$60M
<b>IP Portfolio:</b>	Over 250 Patents pending; 85 granted 2 proprietary microbe families

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## About LanzaTech

LanzaTech is a leader in gas fermentation technology. It provides novel and economic routes to fuels and high value chemicals from industrial wastes and residues such as industrial flue gases from steel mills and other processing plants; syngas generated from any biomass resource such as MSW, organic industrial waste and agricultural waste and reformed methane residues.

LanzaTech's unique microbial process provides a sustainable pathway to produce ethanol and hydrocarbon fuels as well as platform chemicals that are building blocks to products that have become indispensable in our lives such as rubber, plastics and synthetic fibers.

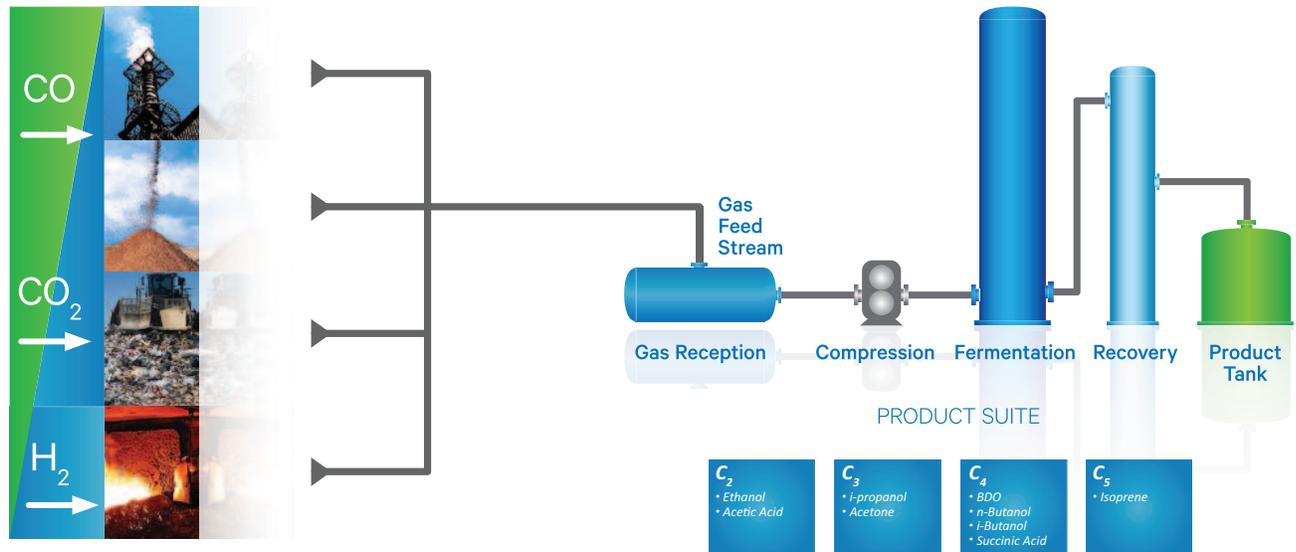
LanzaTech's technology solutions mitigate carbon emissions from industry without adversely impacting food security or causing indirect land use change.

Currently operating a second pre-commercial facility in China using steel mill off-gases for ethanol production, LanzaTech, a company founded in New Zealand is now a global organization with offices in USA, New Zealand, Europe, China and India. Full commercial operation is targeted for 2015.



## The LanzaTech Process

LanzaTech's gas fermentation process uses carbon-containing gases as both a nutrient and energy source for its proprietary microbes to produce fuels and chemicals. The platform is able to utilize gases that contain carbon monoxide (CO), with or without hydrogen (H<sub>2</sub>), or gases containing carbon dioxide (CO<sub>2</sub>) and H<sub>2</sub>, providing a novel approach to carbon capture and reuse.



## Process Scale-up and Commercialization

Importantly, LanzaTech's technology is ready to deploy today with available resources. In 2012, LanzaTech reached key development milestones when it became the first company ever to scale gas fermentation technology to a pre-commercial level. Working closely with its partner in China, Baosteel, LanzaTech developed and successfully operated a facility with an annualized capacity of 100,000 gallons of ethanol and is currently operating a second facility (also 100,000 gal/year), with Capital Steel in Beijing.



2008

Blue Scope  
New Zealand  
Pilot  
(15,000 gal/yr)



2012

Baosteel  
China  
Pre-commercial  
(100,000 gal/yr)



2013

Capital Steel  
China  
Pre-commercial  
(100,000 gal/yr)



2014

WBT  
Taiwan  
Pre-commercial  
(~ 10,000 gal/yr)



2015

Freedom Pines  
USA  
In Design



2X Commercial  
(10 - 30M gal/yr)

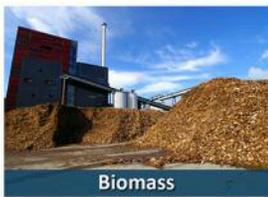
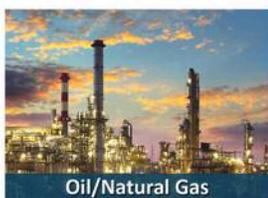
## LanzaTech and Sustainability

The LanzaTech process is completely outside the food value chain and does not create direct or indirect land use change. Patented microbes transform carbon in industrial wastes and residues into low carbon fuels and chemicals. In doing so, the technology reduces overall GHG emissions as it substitutes carbon from fossil fuels. This is a much more efficient use of carbon, then turning it into power and reduces emissions of harmful air pollutants such as NOx and particulates up to 90%. By co-locating and even integrating with the source of input gas, LanzaTech also avoids the capital and energy penalties of collecting, transporting and pre-processing traditional resources.

LanzaTech is working with the Roundtable for Sustainable Biomaterials (RSB) to certify the process across the multiple dimensions of sustainability. LanzaTech's facility with Capital Steel earned a first of its kind sustainability certification from the RSB Services Foundation in 2013. LanzaTech has collaborated with acknowledged leaders in the field, Michigan Technological University, E4Tech and Tsinghua University to validate the life cycle reduction in greenhouse gas emissions which range from 50 to 70 percent for LanzaTech Steel Mill Gas to Ethanol and 75 to 85 percent for Biomass Residue to Ethanol versus conventional petroleum gasoline.

## LanzaTech Relationships by Market Segments

### Industry



### Partners



### End Users/Markets



## State-of-the-Art Labs



### Gas Fermentation

Our lab was specifically designed to allow quick and efficient investigation and research of every aspect of commercial gas fermentation.



### Microbiology

LanzaTech has one of the world's largest collections of industrial fuel and chemical production microbes. To date, we have developed two new proprietary strains of gas fermentation microbes.



### Analytical Chemistry

We have in-house access to full, online, high-throughput gas and liquid analysis facilities.



### Fermentation

Our fermentation suite comprises more than 20 bench-top gas fermentation reactors and a test bay allowing the development and demonstration of several prototype reactor designs in parallel and at scale.

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