



## LanzaTech Produces Ethylene from CO<sub>2</sub>, Changing the Way We Make Products Today

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### Breakthrough Discovery to Replace the Barrel with Synthetic Biology, Addressing One of the Largest Carbon Emitters in the Chemical Industry

LanzaTech NZ, Inc. (“LanzaTech”), an innovative Carbon Capture and Transformation (“CCT”) company that transforms waste carbon into materials such as sustainable fuels, fabrics, packaging, and other products that people use in their daily lives, today announced it has successfully engineered specialized biocatalysts to directly produce ethylene from CO<sub>2</sub> in a continuous process. This breakthrough in bacterium bio-engineering from LanzaTech represents a potential source of advancement towards the company’s mission of replacing fossil-based feedstocks used in the manufacture of everyday consumer goods with waste carbon. In addition to the potential broad reaching implications for global carbon reduction and sustainability, the development represents a significant opportunity for LanzaTech to further penetrate the global ethylene market, which is estimated at approximately \$125 billion in 2022.

Around 160 million tons of ethylene are produced annually. It is the most widely used petrochemical in the world, primarily produced today from fossil inputs in an energy intensive reaction that releases climate damaging CO<sub>2</sub> gas. This development can reverse this paradigm by turning CO<sub>2</sub> into a resource from which ethylene can be produced in a continuous, low temperature, energy efficient process.

Ethylene is a building block for thousands of chemicals and materials and is necessary to make many of the plastics, detergents, and coatings that keep hospitals sterile, people safe, and food fresh. Its production process is also one of the largest sources of carbon dioxide emissions in the chemical industry and remains one of its most challenging processes to decarbonize. With increased pressure to find carbon-neutral alternatives to fossil-based feedstocks and fulfill net-zero pledges, chemical companies and manufacturers using ethylene as their primary feedstock are looking for a more robust and sustainable choice in a post-pollution future. LanzaTech has previously produced ethylene via the indirect ethanol pathway, taking ethanol produced from carbon emissions and then converting this ethanol to ethylene. This latest development bypasses this conversion step in sustainable ethylene production, making the process less energy intensive and more efficient.

“Ethylene production is one of the three largest carbon emitters in the chemical industry. Now is the time to break free from relying on virgin fossil inputs as a feedstock for the things we use in our daily lives,” said LanzaTech CEO Dr. Jennifer Holmgren. “With the ability to directly produce this bulk chemical commodity, we aim to make synthetic biology accessible and bring it to the people in everyday consumer goods. This is not a specialty chemical or a niche market, rather it is something that we believe will have significant impact in the lives of billions of people daily, no matter how much you earn or where you live. This is an exceptional opportunity for to implement meaningful carbon removal and create sustainable synthetic chemicals that we believe can replace fossil fuels forever.”

LanzaTech is already a leader in the scale-up and commercialization of gas-conversion biotechnology. The company is also at the forefront of leveraging synthetic biology to precisely engineer specialized gas eating microbes to produce sustainable versions of key chemicals that are currently made from fossil resources. Through synthetic biology, LanzaTech has consistently translated lab-scale developments into commercial scale operations driving the development of solutions for climate change mitigation by designing direct pathways from CO<sub>2</sub> and CO, to produce cheaper, less energy-intensive, and more sustainable chemicals. We believe that this track record will now extend to the production of ethylene.

World leaders recently gathered in New York for Climate Week and Pittsburgh for the Clean Energy Ministerial. By coming together, they focused the world’s attention on how innovative new technologies created through synthetic biology and AI can help avert a climate catastrophe and transform a global economy into a circular economy.

“I urge world and economic leaders to embrace the role synthetic biology can play in enabling the transition away from fossil fuels this world so desperately needs,” said Dr. Holmgren. “Let’s focus on what is in our power to transition away from virgin fossil inputs to create a carbon economy that transforms waste carbon into one of our most valuable commodities.”