LanzaTech Nutritional Protein

A NEW SUSTAINABLE SOURCE OF ***PROTEIN*** *FROM* CO_2

LanzaTech

Nasdaq: LNZA

Pictured: LanzaTech Nutritional Protein
Produced in pilot facility in Illinois

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High-growth, pure-play carbon-recycling company with capital-light business model, advancing the circular carbon economy by recycling waste carbon feedstocks into fuels, chemicals, materials, and protein used in everyday products

6 commercial plants operating	**> 500,804** metric tons of CO_2 abated to date	**37%** ownership of LanzaJet, a leading sustainable aviation fuel technology provider and fuels producer
14 projects in Advanced Engineering Phase	**50%+** Revenue Growth projected for 2024 using 2024 range midpoint vs 2023 revenue of $62.6M	**19** years of operations (2005), publicly listed on Nasdaq in 2023 ($LNZA)
4+ projects expected to reach FID and enter construction phase during next 12 months	**Disciplined** cost management	**> 1,450** patents secured related to proprietary biorefining operations and technology IP

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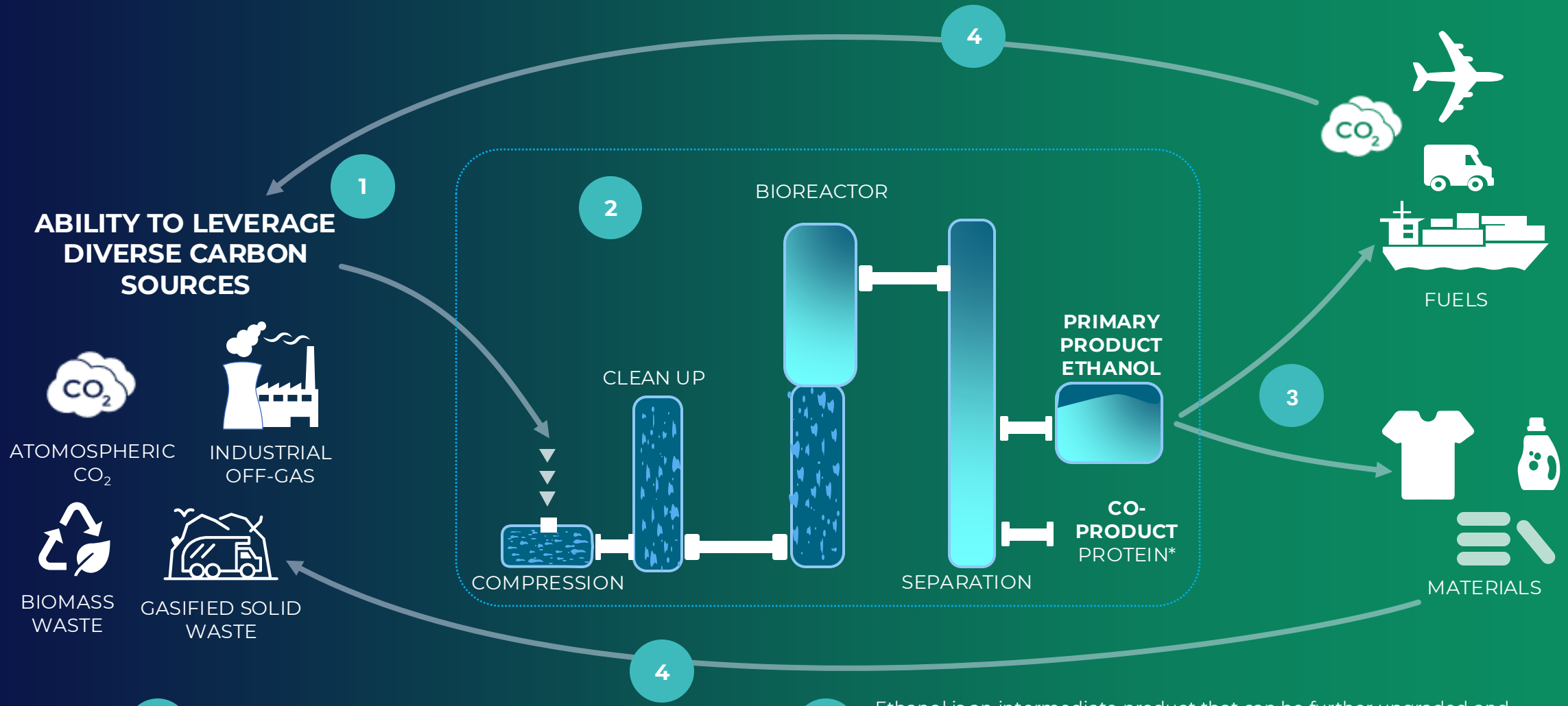
LANZATECH'S INNOVATIVE CIRCULAR CARBON SOLUTION RECYCLES WASTE FEEDSTOCKS INTO VALUABLE PRODUCTS



1. Carbon rich waste gases enter compressor. Solids must first be gasified.
2. LanzaTech process occurs within proprietary bioreactor; microbe consumes carbon in gas and produces ethanol and protein co-product.
3. Ethanol is an intermediate product that can be further upgraded and converted into high value sustainable materials and fuels. ***Today, LanzaTech's biorefining platform produces ~1 metric ton of protein for every 10 metric tons of ethanol.**
4. Circularity-enabled with solid waste carbon gasified and emitted carbon captured and returned to the process.

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LANZATECH NUTRITIONAL PROTEIN (“LNP”) EXPERIENCE

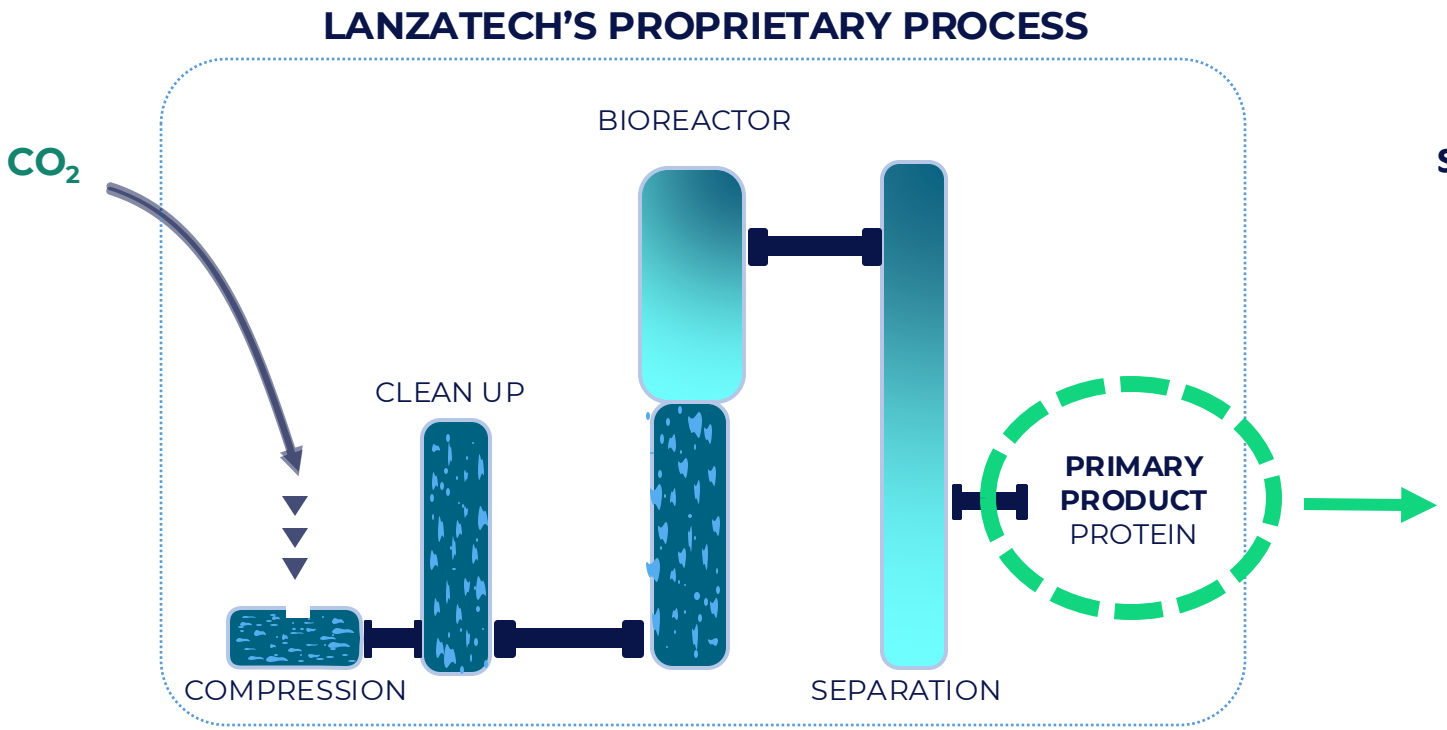
PROTEIN CURRENTLY PRODUCED AS A CO-PRODUCT WITH ETHANOL AT SEVERAL COMMERCIAL SITES

Existing operating plants using LanzaTech’s biorefining platform that produce ethanol as a primary product have produced **25,000 metric tons of protein co-product to date:**

- Several operating plants went through a lengthy process to have protein certified for animal feed
- These plants have since sold protein as an ingredient to aquaculture, poultry, and pig feed producers
- Operations in India are progressing with protein certification for poultry feed markets

LNP PROCESS

Commercializing production of nutrient-rich protein as primary product through LanzaTech's proprietary gas fermentation process



By using a new microbe, LanzaTech's existing biorefining platform **<u>can mass produce protein as the primary product</u>** of its gas fermentation process, which drives incremental value from LanzaTech's core competencies

Entering $1 trillion alternative protein market with new high-quality sustainable source of protein from CO_2

Protein as the primary product as compared to ethanol as the primary product:

- Uses the same bioreactor
- Uses the same feedstocks
- Protein uses new microbe

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THE WORLD NEEDS SUSTAINABLE SOURCES OF FOOD

- **Sustainable & Global:** Can **be made anywhere in the world at low cost** using just CO_2, O_2, H_2 and water. Very little land and water use, no crops

- **Supply–chain security:** Domestic feedstocks resilient to macro disruptions; **production independent of agricultural or climate variation and weather extremes**

- **Value:** Low-cost production and ability to capture carbon credits; improves rural economies by building a market for waste streams (e.g. agriculture residue, CO_2 from corn ethanol plants, biomass, etc.)

Pictured: LanzaTech Nutritional Protein Produced in pilot facility in Illinois

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LNP PRODUCT PROPERTIES

- ✓ Comparable properties to pea and whey protein
- ✓ >85% protein content
- ✓ Contains all 20 amino acids
- ✓ No allergenicity
- ✓ Highly digestible
- ✓ Odorless and neutral color

0.5 metric tons per day of LNP is roughly the equivalent of giving a typical complete daily intake of protein to approximately 9,000 people

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LNP AS A PRIMARY PRODUCT OF GAS FERMENTATION PROCESS

LanzaTech is operating a pilot facility at its headquarters in Skokie, Illinois. The pilot facility has the capacity to produce 1 kilogram per day of LNP:

- Prototyped with animal feed and pet food companies, and animal feed trials are underway (fish, shrimp, chicken, pigs)
- Initiated prototype development with human nutrition trials with Mattson, a food development specialist
- LanzaTech has partnered with the U.S. Naval Research Laboratory on a joint research and contract development project jointly funded by the Office of the Under Secretary of Defense for Research and Engineering, the Office of Naval Research, and the U.S. Naval Research Laboratory to evaluate the viability of creating nutritional proteins on military platforms

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PROTEIN PRODUCTION IS A NATURAL CO-PRODUCT OF LANZATECH'S GAS FERMENTATION PLATFORM

10 YEARS

10 years of development work evolving the platform and creating the **ability to produce nutritional protein from CO_2 as the primary product of gas fermentation process**

NATURAL CO-PRODUCT

Protein is a **natural co-product of gas fermentation process** and is currently sold by several operating facilities as an ingredient into animal and aquaculture feed production markets

LOW-RISK PATH

Successful commercialized gas fermentation at scale enables LanzaTech to offer a **low-risk path to commercial production** of alternative and sustainable nutritional protein

SUCCESSFULLY TRIALED

LanzaTech's protein production has been **successfully trialed as a valuable ingredient for several animal feed, pet food, and human food formulations**, positioning LanzaTech to capture market share in the **$1 trillion** alternative nutritional protein market

READY TO DEPLOY

LanzaTech is ready to deploy pre-commercial and commercial-scale facilities to mass produce protein at cost-competitive prices

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DERISKED LNP SCALE UP:
10 YEARS OF R&D AND PILOTING FOR COMMERCIAL CAPABILITY

2014-2021

LABORATORY SCALE

Feedstock trials in lab; successfully produced protein as primary product

2022-2023

PILOT PRODUCTION

Trials and testing completed for animal feed, pet food, and human nutrition formulations

2024+

PATH TO COMMERCIAL PRODUCTION

- Pre-commercial plant in process. Target in-service date in 2026. Projected capacity of ~280 metric tons per annum (“MTPA”)
- First commercial-scale plant in planning phase. Target in-service date in 2028. Production capacity expected to be >30K MTPA

Pre-commercial facility production capacity expected to be 0.5 - 1.5 metric tons per day

Commercial-scale facility production capacity expected to be >80 metric tons per day

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LNP IS A SINGLE CELL PROTEIN GENERATED FROM GHGs

LanzaTech is a global leader in gas fermentation and has created a protein solution for a resilient future food supply chain that uses a fraction of the land and water resources needed for traditional plant and animal protein sources, leading to a much-reduced impact on the environment and a cost-competitive product

LNP

Requirements for commercial-scale LanzaTech Nutritional Protein plants:

1

Facility

<10

Acres of Land

18

Swimming Pools of Water

And generates:

0

MT CO_2

VS.

To produce…

45,000

Metric tons protein / year

BEEF

The equivalent production of beef protein would require:

509,050

Cows

763,575

Acres of Land

1,067,192

Swimming Pools of Water

And generates:

17,134,615

MT CO_2

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18

Swimming Pools of Water

And generates:

0

MT CO_2

VS.

To produce…

45,000

Metric tons protein / year

CHICKEN

The equivalent production of chicken protein would require:

195,652,174

Chickens

6,417

Acres of Land

324

Swimming Pools of Water

And generates:

787,500

MT CO_2

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LNP

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1

Facility

<10

Acres of Land

18

Swimming Pools of Water

And generates:

0

MT CO_2

VS.

To produce…

45,000

Metric tons protein / year

LAMB

The equivalent production of lamb protein would require:

8,518,855

Sheep

851,886

Acres of Land

755,710

Swimming Pools of Water

And generates:

2,649,194

MT CO_2

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REGULATORY & INTELLECTUAL PROPERTY MILESTONES TO DATE

- ✓ Gas fermentation protected by LanzaTech's established 1,450+ patent estate
- ✓ First patents on direct protein production published in December 2023
- ✓ Regulatory process for human nutrition and animal feed underway
- ✓ FDA Self-GRAS* determination expected in 2024 for LNP
- ✓ Safety gap assessment complete
- ✓ Salmon feed and other trials underway

**GRAS = Generally regarded as safe*

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HUMAN FOOD & BEVERAGE PRODUCT DEVELOPMENT UNDERTAKEN WITH MATTSON SHOWING MULTIPLE INGREDIENT APPLICATIONS

- Meat Alternatives
- Beverages
- Bakery / Bread
- Protein Snacks
- Dairy Alternatives
- Animal-Free Protein Powder
- Protein Bars

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SUMMARY – LANZATECH NUTRITIONAL PROTEIN

- LNP is **protein-dense at >85% protein,** is highly versatile with characteristics similar to pea and whey proteins, and neutral in color, making it an attractive ingredient offering for multiple animal feed and human food formulations
- LNP has a substantially **lower impact across GHG emissions, land use, and water use** when compared to nearly all other protein sources, and can be produced anywhere in the world, regardless of climate and weather extremes
- LNP is produced from 4 main elements – CO_2, O_2, H_2, and water – using **a proven commercialized gas fermentation process** developed by LanzaTech, and leverages existing bioreactor equipment platform and feedstocks
- **Robust market pricing** across animal feed and human nutrition ingredient formulations provides attractive economic return for LanzaTech and partners
- **Sustainable, low cost of production** profile compared to other protein sources, given proven technology and the need for very little land and water use

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LANZATECH'S BIOREFINING PLATFORM ACCESSES DIVERSE & GROWING MARKETS

Today

Ethanol[1]
LanzaTech ethanol may be sold into fuel markets

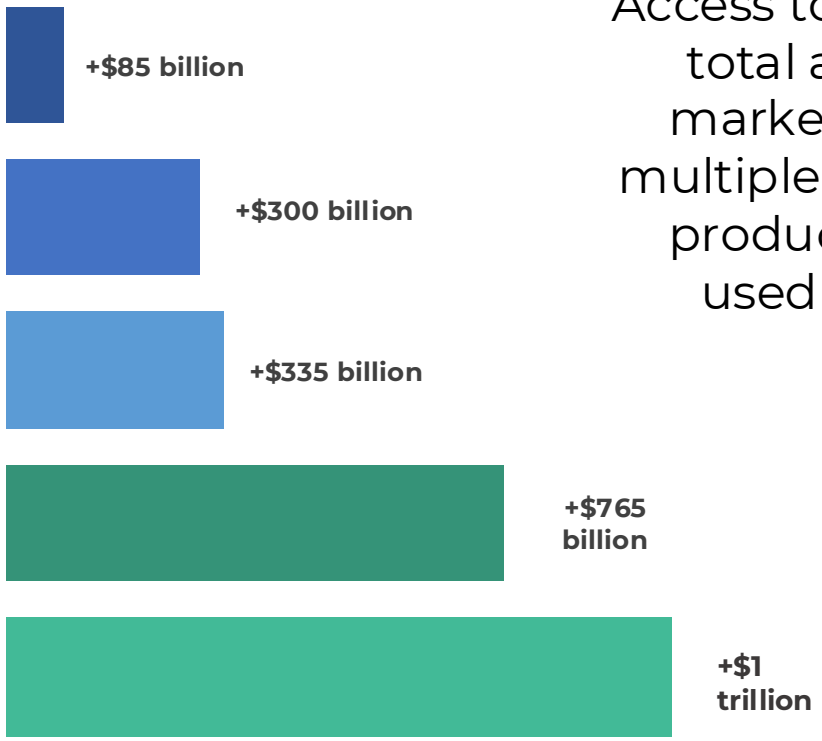
Jet fuel via ethanol[2]
LanzaJet™ Alcohol-to-Jet process can convert LanzaTech ethanol to SAF

Materials via ethanol[3]
LanzaTech ethanol can be converted into a wide range of materials, such as plastics, polymers, and textiles.

Future

Other chemicals and materials[4]
Synthetic biology enables the production of other chemicals, which can be upgraded to materials.

Nutritional protein
LanzaTech Nutritional Protein has applications in animal feed, pet food, and human nutrition.



Access to **>$2 trillion** of total addressable markets, spanning multiple high-demand products and fuels used in daily life

Nutrition **Fuels** **Materials** **Polymers** **Monomers** **Fragrances** **Chemicals** **Solvents**

[1] Ethanol ($89.1B, 2019, Grand View Research, [2] International Air Transport Association, [3] Ethylene ($222B, 2019, The Business Research Company), Ethylene Oxide ($45B, 2020, Research and Markets), PET ($43.8B, 2019, The Business Research Company), MEG ($26B, 2018, Market Research Future), [4] Acetone ($4.6B, 2019, Grand View Research), Isopropanol ($2.7B, 2019, Grand View Research), Isoprene ($2.6B, 2019, Technavio), Polypropylene ($116B, 2019, Grand View Research), Methyl Methacrylate (MMA) ($12.6B, 2019, Fortune Business Insights), Specialty chemicals ($630B, 2019, Grand View Research),

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RECYCLING CARBON TODAY AT COMMERCIAL SCALE