



Sustainably-produced bio-based chemicals

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# The Opportunity to Decarbonize Chemicals

JUNE 2023

# Decarbonizing Chemicals is Vital to Climate Resiliency



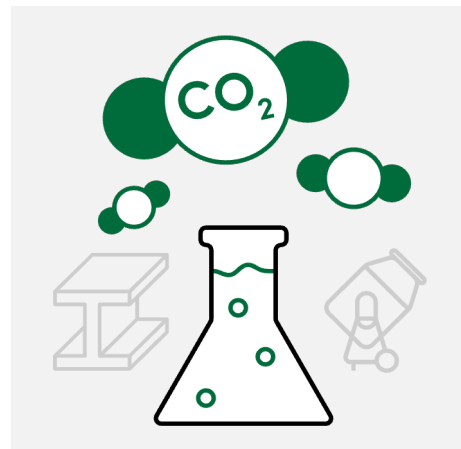
**5.6 GtonCO<sub>2</sub>-eq<sup>1</sup>**

Total greenhouse gas emissions (2020) from the chemical industry was 5.6 GtonCO<sub>2</sub>-eq. This is equivalent to the entire island of Manhattan being covered with ice that's 90m high, about the height of a 22 story building.



**10%**

The chemical industry accounts for 10% of all global emissions (scope 1, 2, 3).<sup>1</sup>



**#3**

The chemical industry has the third largest direct CO<sub>2</sub> emissions within the industrial sector.<sup>2</sup>

1. Bauer, F., Tilsted, J. P., Pfister, S., Oberschelp, C., & Kulionis, V. (2023). Mapping GHG emissions and prospects for renewable energy in the chemical industry. *Current Opinion in Chemical Engineering*, 39, 100881. <https://doi.org/10.1016/j.coche.2022.100881>

2. Industry, International Energy Agency. Retrieved June 30, 2023 from <https://www.iea.org/topics/industry>

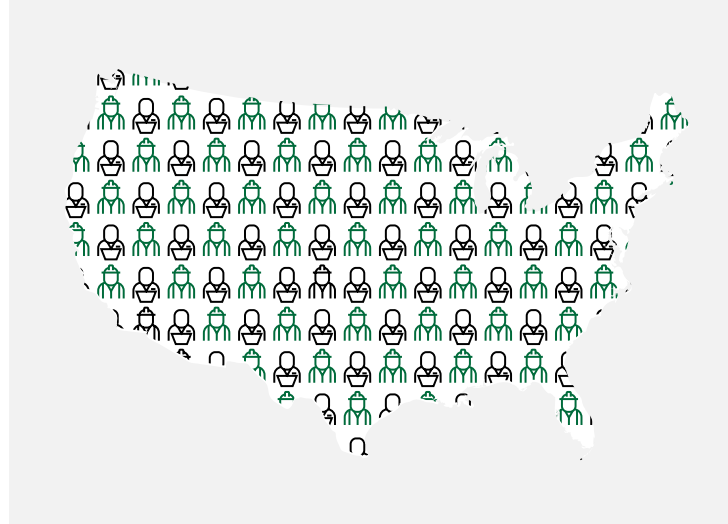


# Industrial Biotechnology Plays a Crucial Role in Decarbonization



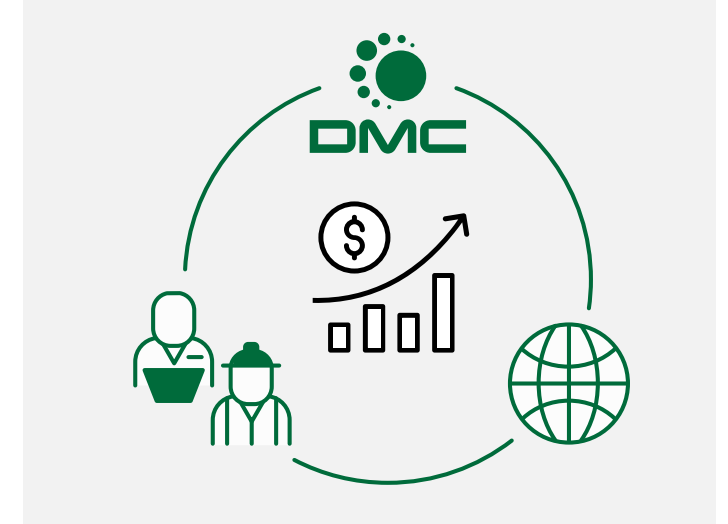
**25%**

of chemical industry emissions may be addressed with synthetic biology and precision fermentation.<sup>3</sup>



**4.6 Million**

American jobs are produced by the biobased product industry which has a \$959.2 billion total economic impact on the U.S. economy.<sup>4</sup>



**\$7 Trillion**

Estimated value of the biobased economy by 2030.<sup>5</sup>

3. Number based on DMC Biotechnologies' estimate using approximation of greenhouse gas (GHG) life cycle emissions for emerging bio-based products being on average 47% lower, as cited in: Zuiderveen, E. A., Kuipers, K. J. J., Caldeira, C. M., Hanssen, S. V., Van Der Hulst, M. K., De Jonge, M. M., Vlysidis, A., Van Zelm, R., Sala, S., & Huijbregts, M. a. J. (2022). The potential of emerging bio-based products to reduce environmental impacts. Research Square (Research Square). <https://doi.org/10.21203/rs.3.rs-1816061/v1>

4. Safeguarding the Bioeconomy, National Academies of Sciences, Engineering, and Medicine. Retrieved July 11, 2023, from <https://nap.nationalacademies.org/read/25525/chapter/1>

5. The Circular Bioeconomy: A Business Opportunity Contributing to a Sustainable World, World Business Council for Sustainable Development (WBCSD). Retrieved July 11, 2023, from <https://www.wbcd.org/Archive/Factor10/Resources/The-circular-bioeconomy-A-business-opportunity-contributing-to-a-sustainable-world>