

Key Insights

- Electrifying recycled plastic, beet sugar, and soybean oil production in Minnesota can **significantly reduce emissions**.
- Electrifying recycled plastic, milk powder, container glass, soybean oil, or beer production may **reduce energy costs** per unit of production.
- Electrifying just the subsectors in this study will **advance Minnesota 1.5% towards its goal of an 80% reduction in industrial emissions by 2050**.

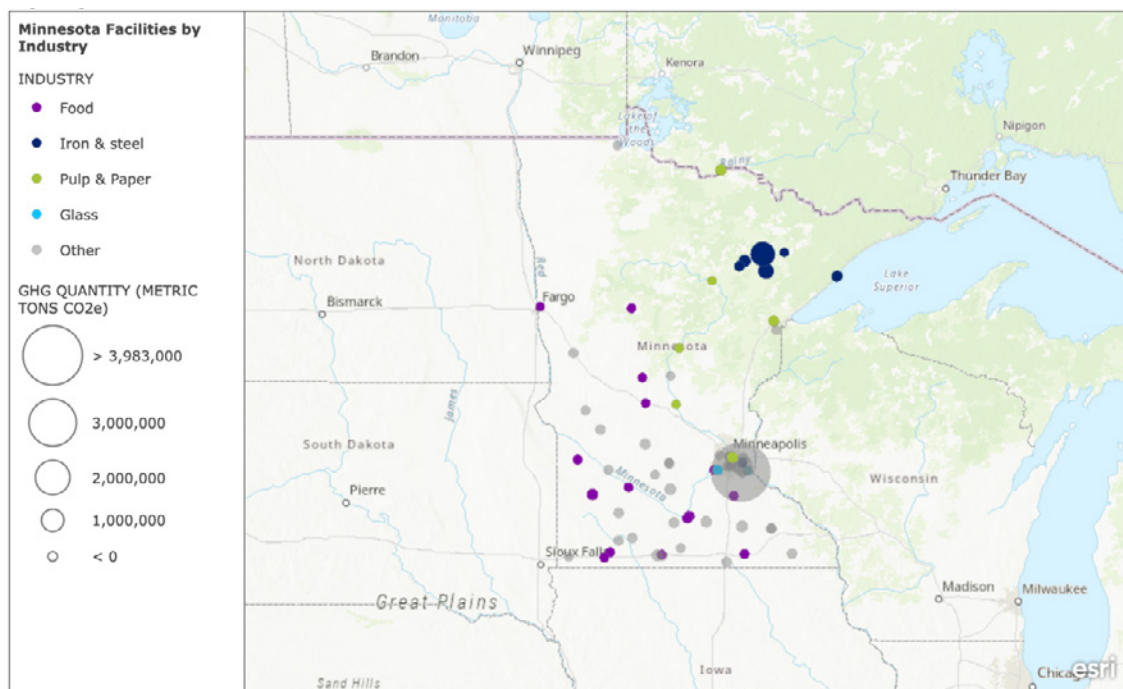
Quick Facts

- **19.5% of Minnesota's GHG emissions** are from industry.¹
- The state is committed to cut greenhouse gas emissions **30% by 2025 and 80% by 2050** compared to 2005 levels.²
- As of 2022, the manufacturing sector employed **11% of the state's workforce** and accounted for more than **13% of total gross state product**.³

Electrifying industrial processes offers a significant opportunity to decarbonize Minnesota's industrial sector, which accounts for 19.5% of the state's greenhouse gas (GHG) emissions.¹ Industrial emissions originate from facilities throughout the state as shown in the map below. These emissions must be reduced to meet the state's emissions reductions goals. In numerous industrial subsectors, electrified technologies can shift production away from carbon-intensive fossil fuels to renewable electricity.

The report [Industrial Electrification in U.S. States](#) analyzes nine of Minnesota's industrial subsectors and the changes in energy use, CO₂ emissions, and energy costs that would occur if individual industrial processes were electrified. This report studied Minnesota's industrial pulp & paper, container glass, plastic recycling, beet sugar, milk powder, wet corn milling, aluminum casting, beer, and soybean oil sectors.

Minnesota's Industrial Emissions



Esri, USGS | Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS

Built using ArcGIS online with U.S. Environmental Protection Agency's Facility Level Information on GHGs Tool (FLIGHT) 2020 data. U.S. Environmental Protection Agency, "Greenhouse Gas Reporting Program (GHGRP)," last accessed February 25, 2022, <https://www.epa.gov/ghgreporting>.

This map shows the relative emissions of large industrial facilities. Facility types that are included in the full report analysis are shown in colors while other industrial facility types are shown in grey.

The study found that, among the Minnesota subsectors analyzed, the following have the potential to reduce emissions by the largest margins, ranked by the expected decrease in annual emissions by 2050 through electrification:

- Plastic recycling (476 kt CO₂)
- Beet sugar (443 kt CO₂)
- Soybean oil (376 kt CO₂)

Deploying electric technologies would result in near-term emissions reductions, and, given the Biden administration's stated policy to achieve a "carbon pollution-free power sector by 2035," electrification could deliver even further decarbonization in the near- and medium-term.

Many electrification technologies considered in this study are commercially available, enabling Minnesota to begin electrifying, and realizing emissions reductions, in the near-term. Within Minnesota today:

- The plastic recycling industry can electrify using electric melting technology, delivering emissions and energy cost savings immediately. The beet sugar industry can electrify using electric heat pumps, steam boilers, and air dryers to begin saving emissions by 2030. Lastly, the soybean oil industry can electrify with electric heat pumps, steam boilers, and fluidized bed technology to see immediate emissions savings and potential energy cost savings in 2050.
- Electrification can bring energy cost savings across five industries, including plastic recycling, milk powder, container glass, soybean oil, and beer, if lower renewable electricity cost is used. Additional cost information can be found in the full report.
- Industrial electrification can be advanced by supporting electrified technology demonstration, financially incentivizing electrification, increasing the state's renewable electricity generation capacity, enhancing the electric grid, and developing the workforce. A decarbonized energy grid is crucial for realizing the full benefits of industrial electrification and bringing Minnesota closer to its emissions reduction goals.

Key Actions to Accelerate Industrial Electrification in Minnesota

- Open a dialogue with the plastic recycling, beet sugar, and soybean oil industries to learn what hurdles prevent manufacturers from adopting commercially available electrified technologies, especially electric melting technology, heat pumps, and electric steam boilers.
- Assist facilities in accessing the Inflation Reduction Act's incentives for electrification, such as the Sec. 48C Advanced Energy Manufacturing Credit and the Advanced Industrial Facilities Deployment Program.
- Leverage federal resources in the Investment in Infrastructure and Jobs Act (IIJA), including opportunities under the Advanced Energy Manufacturing and Recycling Grant Program and the Industrial Emissions Reduction Technology Development Program.
- Ensure sufficient renewable electricity generation resources are built to supply increasing demand and that grid infrastructure can adequately and reliably serve increased loads.
- Engage frontline communities and those working on environmental justice in this industrial transition.

Additional Factsheet Sources:

¹ U.S. Energy Information Administration, "[Introduction and Key Concepts: State Energy-Related Carbon Dioxide Emissions Tables](#)," Independent Statistics & Analysis, U.S. Department of Energy, October 2022.

² Yvonne Prettner Solon, James Metzger, David H. Senjem, Ellen R. Anderson, and Julie A. Rosen, "[Next Generation Energy Act of 2007](#)," Pub. L. No. SF 145, § 216C.05, 2006 Minnesota Statutes (2007).

³ National Association of Manufacturers, "[2023 Minnesota Manufacturing Facts](#)," 2023.

Download the full report and analysis here: <https://www.renewablethermal.org/state-electrification-report>
or from here: <https://www.globalefficiencyintel.com/industrial-electrification-in-us-states>

