

Key Insights

- Electrifying steel production in Michigan can **significantly reduce emissions**.
- Electrifying steel production may **reduce energy costs** per unit of production.
- Electrifying just the subsectors in this study will **advance Michigan 24% towards its goal of net-zero emissions** from the industrial sector by 2050.

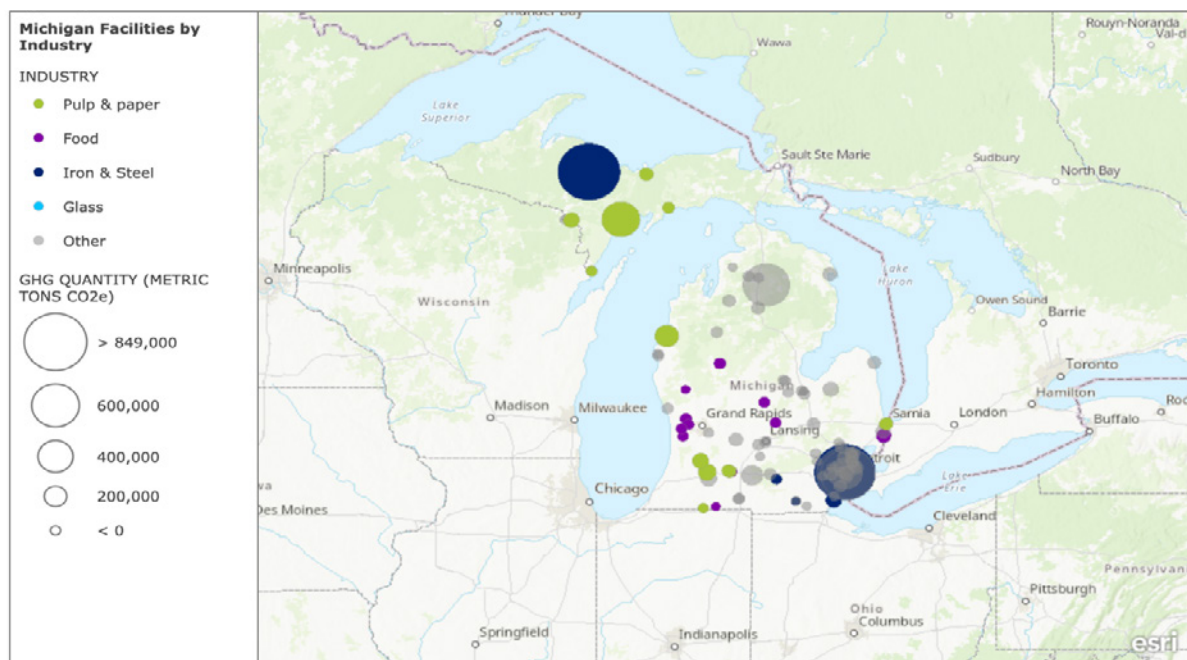
Quick Facts

- **22% of Michigan's GHG emissions** are from industry.¹
- The state is committed to achieve **economy-wide carbon neutrality by 2050** and a **52% GHG reduction by 2030**.¹
- As of 2018, the manufacturing sector employed more than **14% of the state's workforce** and accounted for more than **19% of total gross state product**.

Electrifying industrial processes offers a significant opportunity to decarbonize Michigan's industrial sector, which accounts for 22% 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 and carbon neutrality 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 Michigan'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 Michigan's industrial aluminum casting, pulp and paper, container glass, recycled plastic, steel, beer, beet sugar, milk powder, and soybean oil sectors.

Michigan'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 the following Michigan subsectors studied have the potential to reduce emissions by the largest margins, ranked by the expected decrease in annual emissions by 2050 through electrification:

- Iron & steel (4012 kt CO₂)
- Beet sugar (187 kt CO₂)
- Pulp & Paper (165 CO₂)

Deploying electric technologies would result in near-term emissions reductions, and, given the Biden-Harris 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 Michigan to begin electrifying, and realizing emissions reductions, in the near-term. Within Michigan today:

- The iron and steel sector can electrify using Hydrogen Direct Reduced Iron (H₂-DRI) and Electric Arc Furnace (EAF) technology, immediately delivering energy and emissions savings.
- Electrification can bring energy cost savings across six industries including steel, container glass, milk powder, aluminum casting, beer, and soybean oil 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 Michigan closer to its emissions reduction goals.

Key Actions to Accelerate Industrial Electrification in Michigan

- Open a dialogue with the steel industry to learn what hurdles prevent manufacturers from adopting commercially available electrified technologies, especially H₂-DRI and Electric Arc Furnaces.
- 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.
- Support efforts to establish federally supported H₂ Hubs in the state, given the potential for hydrogen to decarbonize the steel industry with clean electricity.
- 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 Michigan Department of Environment, Great Lakes, and Energy, "[Draft MI Healthy Climate Plan.](#)" January 14, 2022.

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>

