

UC SANTA BARBARA
The 2035 Initiative

Fresh Energy

Advancing Industrial Electrification in Minnesota

Manufacturing is a vital economic engine in Minnesota and a major source of greenhouse gas emissions. Electrifying process heat is one way to modernize the sector and advance toward state net-zero goals.

Read the full report at 2035initiative.com/mn-industrial-electrification

300K+
Minnesotans employed in manufacturing

11%
of Minnesota's annual GDP

18%
of statewide GHG emissions from industry

62 mil.
metric tons of potential GHG emissions savings

THE CLEAN HEAT OPPORTUNITY

Heat is the hidden emitter.
Burning fossil fuels to make heat for industrial manufacturing leads to significant GHG emissions and local air pollution. Low- and medium-temperature heat (<250°C) can be electrified with technologies such as electrode boilers and air-source high-temperature heat pumps.

The technology is ready today.
Like EVs and residential heat pumps, electric technologies for industrial heat are commercially available, proven at U.S. facilities, and ready to scale. These technologies can make Minnesota's exports to the E.U. more competitive and strengthen American clean energy supply chains.

Three sectors lead the opportunity.
Pulp & paper, chemicals, and food & beverage manufacturing have large shares of low- and medium-temperature process heat, making them prime candidates for industrial electrification. In particular, the soybeans, beet sugar, and ethanol manufacturing sectors can be first-movers.

Up to 66% emissions cut.
Across 33 large facilities in Minnesota, electrifying certain industrial processes could reduce emissions from those processes by up to 66% through 2050 — about 62 million metric tons CO_2e. Grid decarbonization driven by Minnesota's clean electricity standard makes this possible.

UC SANTA BARBARA
The 2035 Initiative

Fresh Energy

POLICY TO MODERNIZE MINNESOTA MANUFACTURING

1 Design smart industrial electricity rates.

State officials should work with the Minnesota Public Utilities Commission (MPUC) to establish special industrial electricity rates for facilities that electrify. Strict qualification criteria, encouraging off-peak consumption through pricing incentives, and using revenue from new loads to offset grid investments can ensure electrification does not strain the grid or raise rates for other rate classes.

2 Build a durable industrial decarbonization strategy.

Supported by federal funding, Minnesota is leading the way on innovation in the food & beverage sector with its Climate Smart Food Systems program. Policymakers should convene stakeholders to evaluate first-round outcomes and work with the legislature to establish a durable financing mechanism that extends support.

3 Plan for manageable load growth.

Full electrification of LMT process heat at 33 of the state's largest manufacturing facilities would add an estimated 6.5 TWh of annual load using the most efficient technologies. But, this load would be phased in gradually as facilities electrify and can be managed with proactive grid planning, demand flexibility, and behind-the-meter solutions.

4 Cap emissions and re-invest in electrification.

A cap-and-invest program covering the industrial sector can bring down emissions and generate revenue to re-invest in electrification. Colorado and California offer models for state-level policy.

SOURCES

1. National Association of Manufacturers. Minnesota. April 2026.
2. Minnesota Pollution Control Agency. Greenhouse Gas Emissions in Minnesota 2005–2022. January 2025.
3. Mariano, Thomas, Quinn, Isakson, Stokes, Masanet. Advancing Industrial Electrification in Minnesota. The 2035 Initiative & Fresh Energy. April 2026.
4. Hoffmeister, A. et al., Industrial Electrification Across the United States. ACEEE. July 2025.
5. U.S. EIA. Electric Sales, Revenue, and Average Price (Table 8). Oct. 2025; Natural Gas Monthly (Table 22). Nov. 2025.
6. Minnesota Pollution Control Agency. Minnesota climate-smart food systems. Accessed April 2026.
7. Fresh Energy, Great Plains Institute, NRRI, 5 Lakes Energy. Net Zero Industry in Minnesota. March 2026.