

Advancing Industrial Electrification in Pennsylvania

Pennsylvania has one of the largest and most energy-intensive manufacturing sectors in the country. Electrifying industrial process heat can deliver cost-effective emissions reductions, long-term health benefits, and economic growth for Pennsylvanians.

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30%

of statewide GHG
emissions from industry

\$12.6B

in annual exports to
the European Union

13.5 mil.

metric tons of potential
GHG emissions savings

\$396M

invested through
RISE PA

THE CLEAN HEAT OPPORTUNITY

Electrifying industry heat means cleaner air.

Burning fossil fuels to make heat for industrial manufacturing leads to significant GHG emissions and local air pollution. Low- and medium-temperature heat (<300°C) can be electrified with technologies such as electrode boilers and air-source high-temperature heat pumps.

The technology is ready — and the economics are compelling.

Like EVs and residential heat pumps, electric technologies for industrial heat are commercially available, proven at U.S. facilities, and ready to scale. We find that “advanced” electrification with an air-source high-temperature heat pump can approach lifetime cost parity with natural gas equipment in Pennsylvania today.

Pulp & paper and chemicals sectors lead the opportunity.

Pulp & paper and chemicals manufacturing have large shares of low- and medium-temperature process heat and the most favorable economics for electrification. Pennsylvania's food & beverage sector can also be an early mover with targeted policy support.

Up to 26% emissions cut.

Across 17 large facilities in Pennsylvania, electrifying target industrial processes could reduce emissions from those processes by up to 26% through 2050 — about 13.5 million metric tons CO₂e. Decarbonizing the grid in parallel will unlock the full emissions savings potential.

POLICY TO MODERNIZE PENNSYLVANIA MANUFACTURING

1

Build on RISE PA to create durable support.

Pennsylvania's RISE PA program has allocated \$396 million to industrial decarbonization. Policymakers should prioritize advanced electrification technologies such as high-temperature heat pumps for support with remaining project funds. The governor and commonwealth officials should also work with the legislature to establish a durable financing mechanism that extends support beyond RISE PA's current funding horizon.

2

Design preferential industrial electricity rates.

Although Pennsylvania has one of the smallest electricity-to-gas price gaps in the nation, industrial electricity is still roughly twice as expensive as natural gas. Commonwealth officials should work with the PUC to establish a preferential tariff for facilities that electrify. Setting strict qualification criteria and encouraging off-peak consumption can help ensure electrification does not strain the grid or raise rates for other rate classes.

3

Plan for manageable load growth.

Electrifying LMT process heat at 17 of the state's largest manufacturing facilities would add an estimated 2–5 TWh of additional annual load. This load would be phased in gradually and can be managed with proactive grid planning, demand flexibility, and behind-the-meter solutions. Pennsylvania's growing data center footprint also creates an opportunity: waste heat recovered from data centers can serve as a low-cost heat source for industrial processes, reducing load growth and further improving the economics of electrification.

4

Cap emissions and re-invest in electrification.

A cap-and-invest program covering the industrial sector can generate revenue to reinvest in electrification and drive down emissions across the Commonwealth. Proceeds could be directed toward technical assistance programming or direct capital improvement grants. Gradually requiring facilities to adopt clean heat technologies can address hazardous air quality in communities overburdened by industrial pollution, including Allegheny, Philadelphia, and several other Pennsylvania counties currently in nonattainment under the Clean Air Act.

SOURCES

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READ THE REPORT

