2020 QUADRENNIAL REPORT

FACT SHEETS

ADDITIONAL DATA ON MINNESOTA'S ENERGY LANDSCAPE CAN BE FOUND IN THE **2020 ENERGY POLICY AND CONSERVATION QUADRENNIAL REPORT** AT MN.GOV/COMMERCE.

COMMERCE DEPARTMENT

Overview of Minnesota's Energy Landscape

Minnesota has no indigenous fossil fuel reserves to supply its energy needs. Most of the energy consumed within Minnesota comes from other states and Canada. Over 73% of the energy consumed in Minnesota comes from fossil fuels used for heating, industrial processes, transportation, and electricity generation. More than half of imported electricity is generated with fossil fuels. However, Minnesota has an abundant supply of wind, solar, and bio-based energy.

Minnesota ranks among the top five states in the nation for ethanol production capacity, according to U.S. Energy Information Administration (EIA) data. In addition, Minnesota ranks among the top 10 states in electricity generation from wind and solar energy. Renewable resources continue to make up an increasing share of the state's energy supply. A diagram, below, of Minnesota's energy use in 2018 shows how energy flows from primary fuel sources and how it is used, including where energy is lost due to system inefficiencies. Notably, more than half of the energy consumed in the state is wasted, rendering only 42.3% (661 trillion Btu) of the energy useful.

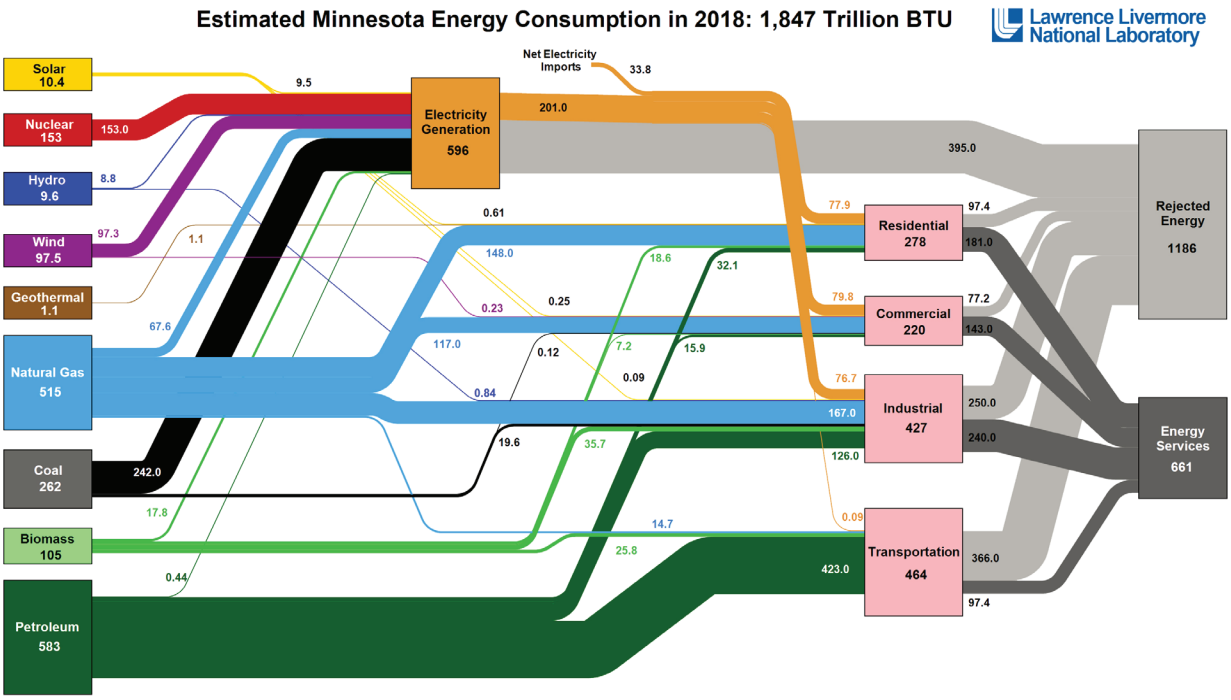

Fig. 1-A: Out of all energy consumed in Minnesota in 2018, over 57% went unused as waste heat.

Figure 1-A shows Minnesota's estimated energy consumption in 2018. Of the 1,847 trillion Btu consumed that year, more than 57% went unused as waste heat.

Source: Lawrence Livermore National Laboratory.

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Renewable Energy Goal for Total Energy Use

Goal: Derive 25% by 2025 of total energy used in the state from renewable resources for heating, industrial processes, transportation, and electricity generation (Minnesota Statute §216.05).

Status: Minnesota obtained 16% of its total energy from renewable resources in 2018 and is at risk of missing its 25% by 2025 goal.

In 2018, 16% of the total energy consumed in Minnesota for heating, industrial processes, transportation, and electricity generation came from renewable sources, compared with a United States average of 11% renewable consumption. Minnesota is at risk of missing the State goal to provide one-fourth of its total energy consumption from renewable sources by 2025. Achieving this goal could be possible with a long-term decrease in total energy consumption (reducing the denominator) or a 5 to 10% increase in renewable energy consumption (increasing the numerator).

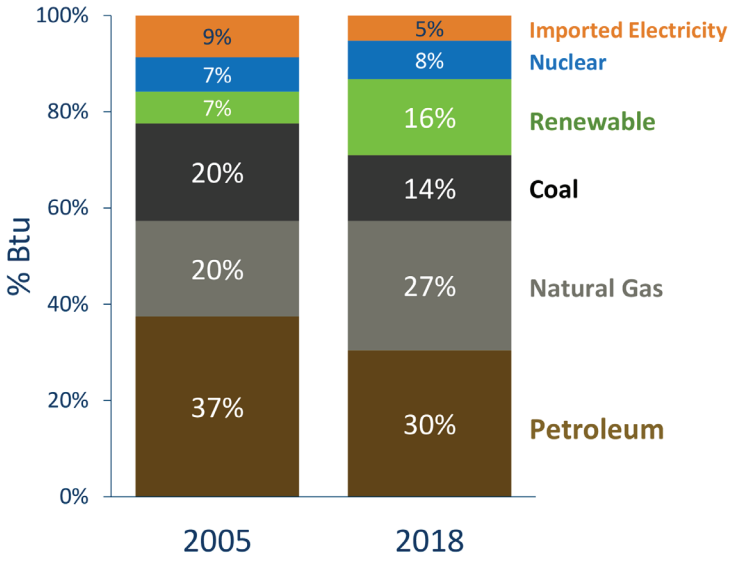

Fig. 1-B: In 2018, 16% of all energy consumed in Minnesota came from renewable sources.

Source: U.S. EIA

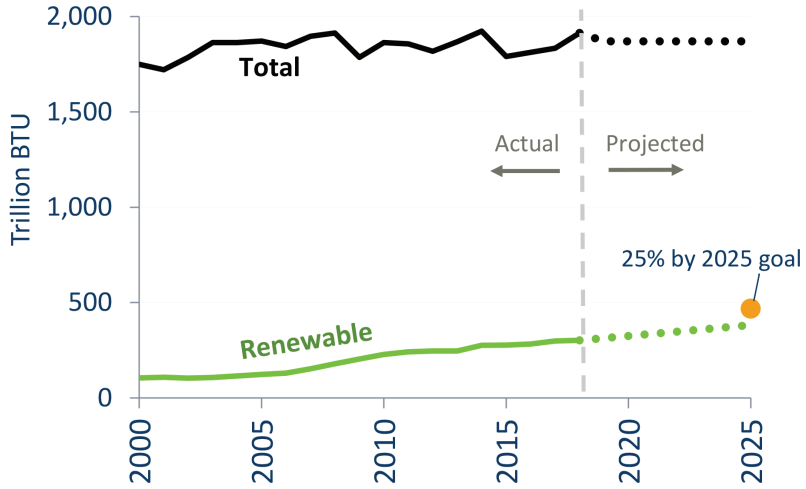

Fig. 1-C: Minnesota is at risk of missing its goal of 25% of total energy use from renewables by 2025.

Source: U.S. EIA

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Greenhouse Gas Emissions Reduction Goal

Goal: To reduce greenhouse gas emissions statewide to a level at least 15% below 2005 base levels by 2015, 30% by 2025, and 80% by 2050 (Minn. Stat. §216H.02).

Status: Minnesota missed the 2015 milestone and is not on track to meet 2025 goals.

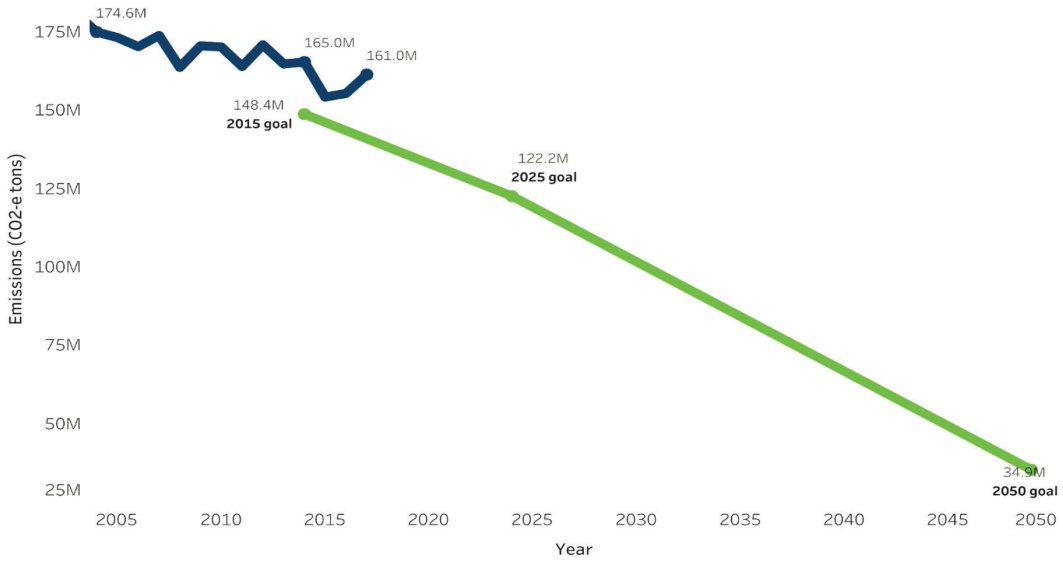


Fig. 1-D. Minnesota is not on track to meet its 2025 greenhouse gas emissions goals.

Source: Minnesota Pollution Control Agency

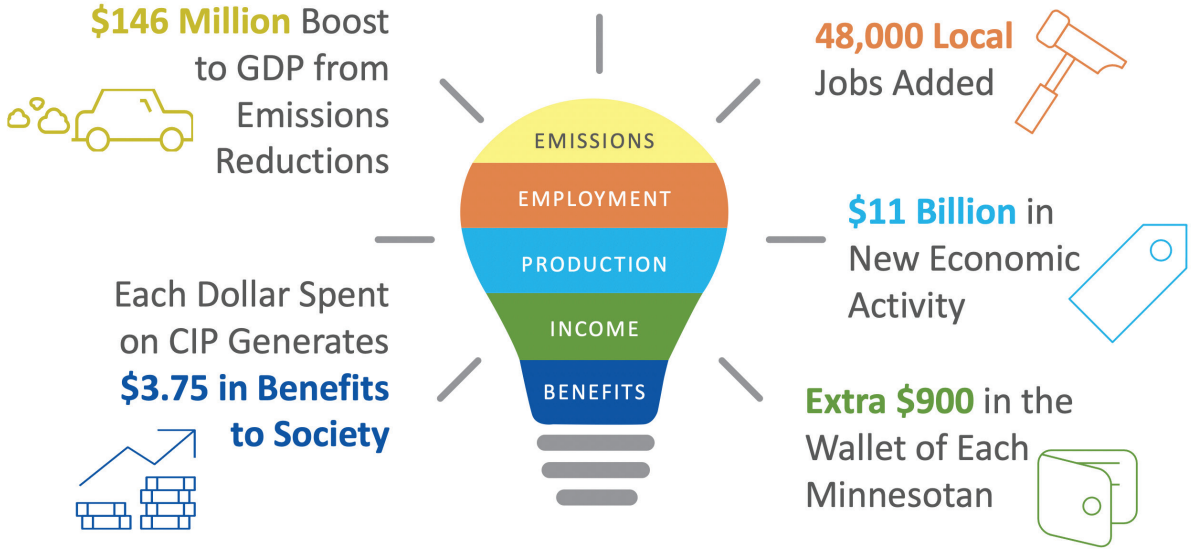
In 2007, Governor Tim Pawlenty signed the bi-partisan Next Generation Energy Act into law, setting statutory goals to reduce greenhouse gas (GHG) emissions by 15% from 2005 levels by 2015, 30% by 2025, and 80% by 2050. Minnesota missed its goal in 2015 and currently is not on track to meet future goals. Since 2005, overall GHG emissions overall have declined by just 8%.

The positive progress in Minnesota so far has been concentrated in the electricity generation sector. Between 2005 and 2018, the carbon intensity of electricity delivered for Minnesota consumption decreased by 29%. In the same timeframe, all other parts of the economy have seen only modest reductions or emission increases. Emissions attributable to industrial, residential, and commercial activity have all increased by 15% or more.

Minnesota continues to see excellent progress in reducing emissions from electricity consumption because of growth in renewable electricity and reduction in coal-fired electricity, primarily from generation within state borders. Future emissions reduction in the power sector will depend on the resources chosen within and outside state borders to serve load in Minnesota as aging power plants continue to retire.

Energy Savings Goal and the Conservation Improvement Program

Goal: Energy savings of 1.5% of average annual retail sales each year for electric and natural gas utilities, unless adjusted by the commissioner to no less than 1.0% (Minn. Stat. §216.241).



Status: Utilities are meeting and exceeding their energy efficiency goals.

Fig. 1-E: Each dollar spent on CIP generates $3.75 in benefits to society.

Source: Cadmus

Minnesota's Conservation Improvement Program (CIP) establishes an annual savings goal of 1.5% of average retail sales for electric and natural gas utilities. During 2017 and 2018, electric utilities exceeded the CIP goal of 1.5%, and natural gas utilities exceeded the statutory minimum of 1.0% energy savings. In total, in years 2017 and 2018, energy conservation programs benefited Minnesota's environment and economy by:

- Saving around 15.2 trillion Btu of energy — enough energy to heat, cool and power more than 160,000 Minnesota homes for a year;
- Reducing CO_2 emissions by 1.79 million tons, equivalent to removing over 350,000 vehicles from the road for one year;
- Saving Minnesota's businesses and residents over $279 million in energy costs; and
- Supporting over 48,000 energy efficiency jobs, representing the largest share of Minnesota's clean energy employment.

CIP brings positive economic and societal benefits to Minnesota, according to an independent 2020 study of CIP investments made from 2013 to 2018. The study found that each dollar spent on CIP generates $3.75 in benefits to society. The study also showed that CIP generates numerous immediate and persistent positive economic effects on energy bill savings, job growth, and environmental benefits.

Energy Use in Buildings

Goal: Energy savings of 1.5% of annual electricity and natural gas retail sales through conservation improvement programs and rate design, energy codes and appliance standards, and programs designed to transform the market or change consumer behavior and other efforts (Minn. Stat. §216B.2401).

Status: Utilities are meeting their energy savings goals, but overall emissions and energy use from buildings are increasing.

As a cold-climate state, energy efficiency is critical. Minnesota has some of the coldest winter weather in the nation, coupled with hot, humid summers. Buildings require large amounts of energy to heat and cool. In 2017, Minnesota's buildings consumed 40.6% of the total energy use in the state, 19.5% of which was from commercial buildings, including large multifamily buildings.

In Minnesota, the average energy burden is 2%, while low-income households average an energy burden of 8% and some Minnesotans face an energy burden exceeding 30%. The federally funded Low-income Weatherization Assistance Program supports home energy efficiency upgrades, lowering the energy burden of households with income at or below 200% of the federal poverty level.

Minnesota's growing population combined with long-term housing shortages are driving new building construction in the state. From 2016 to 2019, Minnesota's population and number of households increased by 2.7%. From 2018 to 2032, Minnesota's population is estimated to increase by 7%. Between 2016 and 2018, between 11,000 and 14,000 homes were built each year. During the same timeframe, more than 5 million square feet of commercial building space was added each year in the Twin Cities area.

Building codes provide a significant opportunity to reduce energy consumption and reduce energy bills. The relationship between building codes and energy use intensity (EUI) in buildings has been well documented. On March 31, 2020, the Minnesota Department of Labor and Industry updated the commercial building energy code from the 2012 International Energy Conservation Code (IECC) to the 2018 IECC. The U.S. DOE estimated that the new building standards will result in more than 8% energy cost savings and 6% energy savings. The 2021 IECC building code was approved in 2020 is expected to further improve efficiency by 10% in residential and commercial buildings for decades to come.

Buildings Consume over 40% of Energy in MN

Minnesota's policies and programs work together to support cost-effective energy conservation and efficiency in new and existing buildings. Minnesota is the only Midwestern state that consistently ranks in the top 10 states nationwide in the American Council for an Energy-Efficient Economy (ACEEE) State Energy Efficiency Scorecard. As a result of these efforts, Minnesota's per capita energy consumption is lower than nearly two-fifths of other states.

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Renewable Electricity Standards

Goal: Derive 25% of retail electricity sold in the state from renewable resources by 2025; 30% for Xcel Energy by 2020 (Minn. Stat. §216B.1691, Subdivision 2a).

Status: Utilities retired renewable energy credits (REC) representing more than 20% of 2019 retail electricity sales in Minnesota. Utilities are planning for renewable generation to meet or exceed future RES milestones.

Minnesota's utilities are on track to meet and exceed their RES milestones of 30% by 2020 for Xcel Energy and 25% by 2025 for other electric utilities. In 2019, utilities retired RECs for more than 20% of the electricity sold in Minnesota.

Historically, Minnesota and the Midwest have relied on coal as the primary fuel source for electricity generation. However, Minnesota's suite of energy policies, combined with the low cost of natural gas and ongoing reductions in renewable energy technology costs, have led to a rapidly changing mix of resources used to generate electricity within state borders.

Based on preliminary 2020 data, between 2005 and 2020, electricity generated within Minnesota from renewable sources increased four-fold from 6% of electricity generated in 2005 to 29% in 2020. This has moved renewable energy closer to becoming the primary source of electricity generated within the state.

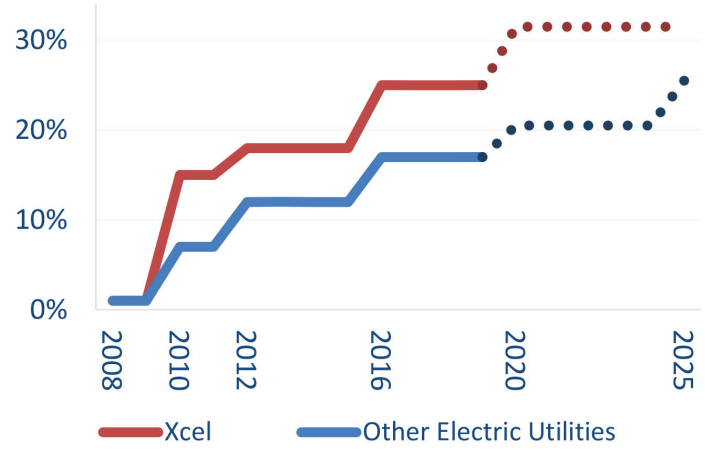

Fig. 1-F: Utilities are on-track to meet and exceed the Renewable Electricity Standards.

Source: Minnesota Department of Commerce

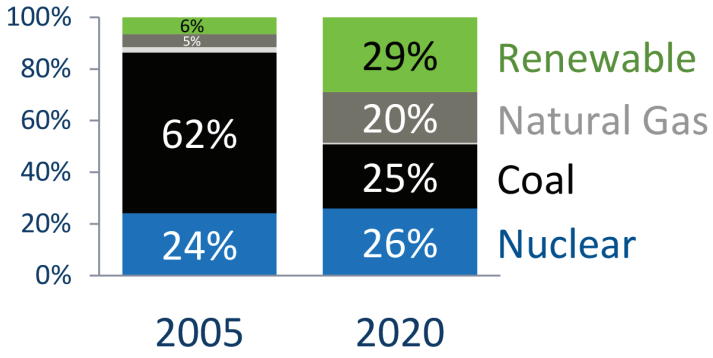

Fig. 1-G: Electricity generation within Minnesota's borders is transforming.

Source: U.S. EIA

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Solar Electricity Standard

Goal: Generate 1.5% of public utility retail electricity sales from solar energy by 2020, and 10% of all retail electricity sales from solar energy by 2030 (Minn. Stat. §216B.1691, Subd. 2f).

Status: Utilities are planning for solar generation to meet or exceed the 1.5% standard.

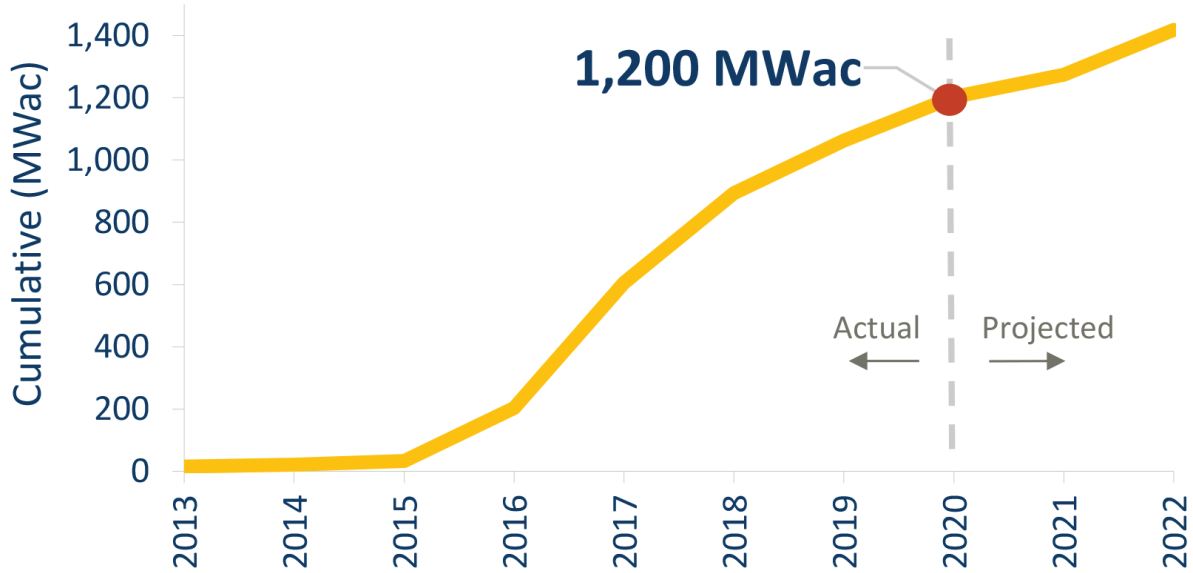


Fig. 1-H: Minnesota's solar generating capacity has grown rapidly since 2015.

Figure 1-I shows Minnesota's cumulative solar power capacity from 2013 - 2020, with growth through 2022 projected to continue at a similar rate.

Source: Minnesota Department of Commerce

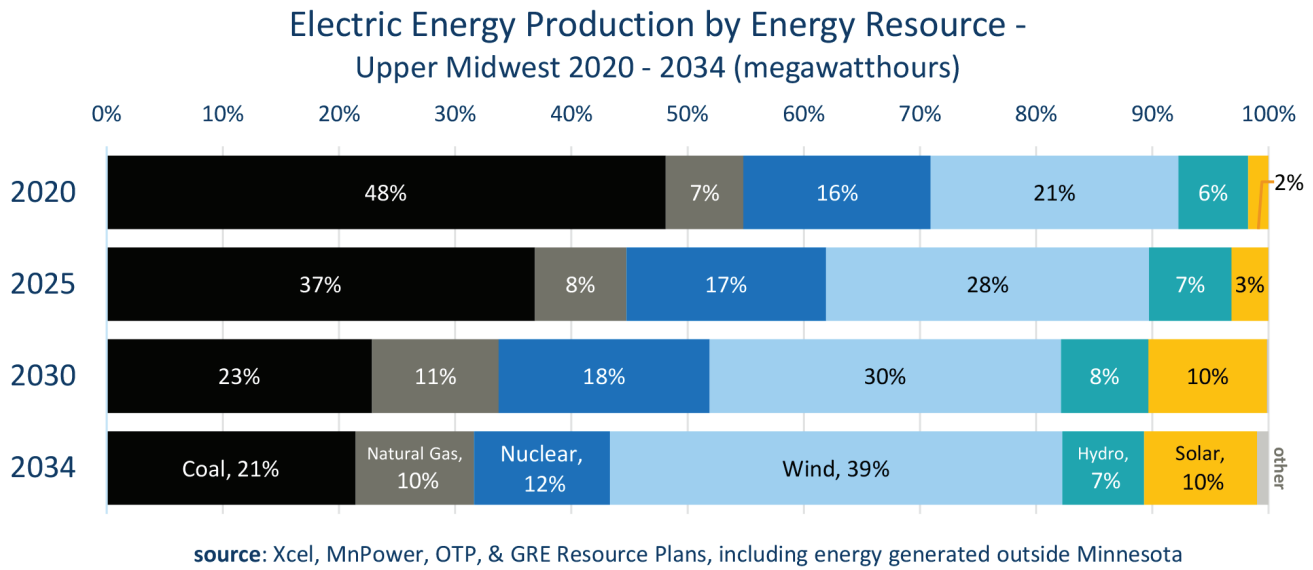
Power generated from solar energy in the state has increased significantly in recent years. In 2013 the State amended the Renewable Energy Objectives Statute to include a Solar Electricity Standard of 1.5% by the end of 2020 for three investor-owned utilities: Minnesota Power, Otter Tail Power Co., and Xcel Energy. The SES also sets a state goal that by 2030, 10% of all electricity sales in Minnesota must be generated by solar energy.

According to preliminary data from the U.S. EIA, solar energy accounted for 3% of electricity generated within Minnesota in 2020, mainly from Xcel's Energy's community solar garden programs and utility-scale facilities that have at least 1 MW of generating capacity.

Preference for Renewable Energy in Resource Planning

Goal: Electric generation and transmission utilities that serve load in Minnesota are required to identify options for renewable energy resources in their long-term plans to serve customer needs (Minn. Stat. §216B.2422, Subd. 4).

Status: Utilities are evaluating potential system options to pursue least-cost, environmentally sound, and efficient resources consistent with current State and Federal laws and goals.



source: Xcel, MnPower, OTP, & GRE Resource Plans, including energy generated outside Minnesota

Fig. 1-I: Utilities are planning to transition to an energy mix that is 70% carbon free by 2034

Figure 1-I shows the projected resource mix between 2019 and 2034 for power delivered to Minnesota – including energy generated both inside and outside of the state – based on Xcel, Minnesota Power, Otter Tail Power, and Great River Energy resource plans and announced power plant retirements.

Eleven electric generation and transmission utilities that serve Minnesotans are required to file long-term plans on the resources needed to meet customer needs. An aggregated forecast of electric energy generation—including energy generated both inside and outside of Minnesota—based on Xcel, Minnesota Power, Otter Tail Power, and Great River Energy resource plans and announced power plant retirements predicts a renewable electricity mix that includes 70% carbon-free resources by 2034, with 56% renewable resources (7% hydro, 10% solar, and 39% wind).

Future emissions reduction in the power sector will depend on the resources chosen to serve load as aging power plants continue to retire.

COVID-19 Response and Energy Policy

The 2020 political climate combined with the pandemic and civil unrest amplified social and economic disparities in Minnesota. The Minnesota Department of Commerce continues to monitor emerging trends in the energy sector with a focus on relief and recovery efforts for low-income households and businesses affected by civil unrest.

COVID-19 Timeline

Dec. 2019	Coronavirus disease 2019 (COVID-19) variant was identified in Wuhan, China.
March 6, 2020	Health officials confirmed the first known case of COVID-19 infection in Minnesota.
March 13, 2020	Governor Walz issued Emergency Executive Order 20-01, declaring a peacetime emergency.
March 25, 2020	The Minnesota Department of Commerce and Public Utilities Commission (PUC) issued a joint letter to electric and gas utilities requesting voluntary extension of cold weather rule protections to suspend shut-offs. More than 130 municipal utilities and cooperatives that are not state-regulated responded to a March request from the PUC to suspend disconnections, offer payment plans, and remove late fees during the pandemic.
March 27, 2020	Congress approved the $2.2 trillion Coronavirus Aid, Relief, and Economic Security (CARES) Act including $900 million of additional funds for the U.S. DOE Low-Income Home Energy Assistance Program (LIHEAP) nationwide.
May 27, 2020	The IRS extended a Safe Harbor provision for energy Production Tax Credits (PTC) and Investment Tax Credits (ITC).
Aug. 13, 2020	The PUC issued an order requiring regulated gas and electric utilities to suspend disconnections and provide additional consumer protections.
Dec. 21, 2020	Congress passed the $2.3 trillion Consolidated Appropriations Act, 2021 including the 2020 Energy Act with significant changes in climate and energy policy.

Electricity Consumption Trends

Initial analysis shows that 2020 changes in electricity consumption were most pronounced among commercial and industrial energy users. EIA estimates nationwide retail sales of electricity to the commercial and industrial sectors fell by 6.0% and 7.9%, respectively. Despite a mild winter, overall residential consumption of electricity across the U.S. increased 1.3% in 2020, with people spending more time at home because of the pandemic.

Natural Gas Consumption Trends

The EIA estimated that U.S. natural gas consumption declined 2.5% in 2020 compared to 2019 levels because of reduced commercial and industrial consumption, reduced electricity generation, and milder winter weather.

2020 Federal Energy Policy Changes

IRS Extends Safe Harbor for PTC and ITC

The pandemic caused widespread supply-chain disruptions and worker shortages that delayed the construction of some solar and wind power projects. In response, the Internal Revenue Service issued a notice on May 27, 2020 extending the safe harbors for the renewable energy production tax credit (PTC) and investment tax credit (ITC).

COVID also prompted factory shutdowns in China early in the pandemic, which led to supply chain problems that constrained solar supplies. However, factories restarted production in April 2020, creating excess capacity on the manufacturing side. Less expensive modules could benefit solar developers in the short term. The pandemic's long-term effects on renewable energy projects in Minnesota remain unclear.

Coronavirus Aid, Relief, and Economic Security Act

Congress approved the Coronavirus Aid, Relief and Economic Security (CARES) Act on March 27, 2020, providing $900 million of additional funding for the Low-Income Home Energy Assistance Program (LIHEAP) to support households with mounting energy bills driven by COVID-related unemployment. In late January 2021, the National Energy Assistance Directors' Association estimated that an additional $10 billion in emergency funding would be needed to help four million families pay off growing utility debt and to help seven million families pay current bills through Sept. 30, 2021.

Consolidated Appropriations Act

Congress passed a $2.3 trillion appropriations package on Dec. 21, 2020 by combining a $1.4 trillion omnibus government funding bill with a $900 billion pandemic relief package. In addition, the legislation requires an 85% reduction over 15 years in hydrofluorocarbons, a potent group of greenhouse gases, and includes significant energy policy changes.

The 2020 Energy Act, which was incorporated into the Dec. 21 spending bill, includes:

- A reauthorization of the U.S. DOE Low-Income Weatherization Assistance Program through 2025, with FY2021 funding at $310 million (a 2% increase over FY2020) to help low-income families improve home energy efficiency and cut energy bills, while improving their home health and safety;
- FY 2021 funding for the U.S. DOE State Energy Program at $62.5 million, the same as FY 2020, to enhance energy security and support state efficiency and renewable energy goals;
- An extension of credits for energy-efficient homes, up to $2,000 for new energy-efficient homes, through 2021;
- Making permanent the 179D energy efficiency tax deduction for commercial buildings.
- An extension of the production tax credit at 60% of the full credit amount, or $18/MWh, for an additional year through Dec. 31, 2021;
- An extension of the investment tax credit at 26% for two years through 2022, and an expansion of the tax credit to include waste heat-to-power investments; and
- $35 billion in funding for clean energy research and development.