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# City of Red Wing Climate Action Work Plan 2020 - 2025



# Acknowledgements

The Red Wing Climate Action Work Plan builds upon past work and is the culmination of effort from city staff, Sustainability Commission members, and external partners.

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# Introduction

Red Wing is a small city in Minnesota with about 16,500 residents. Located along the bluffs of the Mississippi River, the city is known as a regional hub for culture, scenic views, and outdoor activities. The city recently completed its [2040 Comprehensive Plan](#) where it lays out a goal to be the most healthy, vibrant town in the Midwest — economically, socially, physically, and mentally. The plan leans on five principles to achieve this vision: sustainability, health, accessibility, resiliency, and equity. These principles are evident in the third chapter, Environment, which focuses on eight key issues including: waste reduction, energy consumption, renewable energy, and climate action. These key issues, the related goals, and the direction given in the city’s strategic plan provide the foundation for this Climate Action Work Plan (CAWP).

The CAWP was developed to support the city in its effort to advance climate action, demonstrate progress over the next five years, and to prepare the city for the years to follow. The city has a goal to reduce its emissions by 80% (from 2015) on or before 2040. This is an ambitious goal that will require big actions and structural changes over the next twenty years. The purpose of this work plan is to break down the larger challenge into smaller, more manageable actions that build up over time, demonstrating increasing impact.

There are three main sections of the CAWP: the existing conditions report, the greenhouse gas inventory, and the five-year work plan based on the community’s priorities. An existing conditions report was previously completed for the city and incorporated into its 2040 Comprehensive Plan. The existing conditions included in this CAWP provide updated information for current demographics, building energy use, travel data, waste amounts, as well as available renewable energy resources. The greenhouse gas inventory uses data from the Regional Indicators Initiative for 2016-2018 and forecasts emissions to 2040.

The Red Wing Sustainability Commission was the primary decision-making body for the determination of priorities and the development of the CAWP. The Commission was presented with the existing conditions report and greenhouse gas inventory before participating in an exercise to help identify community priorities. These priorities were used to develop a draft work plan for next five years. Each recommended strategy includes tools and resources to support implementation of the selected initiatives. These include tools that ensure inclusive stakeholder engagement for each initiative, support tracking progress, and an inventory of relevant resources for funding and technical assistance. To the extent feasible, this plan will leverage existing community efforts including, but not limited to, the city’s [Green Wing Energy Action Plan](#), its participation in the GreenStep Cities and SolSmart programs, as well as foundational documents such as the 2040 Comprehensive Plan and the [2019 Strategic Plan](#).

This work plan was written in the midst of a global pandemic and economic recession. It is unclear what the long-term impacts will be on travel and building energy use but these conditions should be a consideration as the plan is implemented. The Sustainability Commission suggested final revisions to the plan to ensure it reflects the desired outcomes and key principles of the community. The City Council adopted the CAWP Monday August 10, 2020. Finally, the CAWP is and should be treated as a living document, which will benefit from an annual review process overseen by the Sustainability Commission.



# EXISTING CONDITIONS

Existing conditions include demographic information as well as information about buildings, transportation, waste, renewable energy resources, and existing planning and policy context. This section includes existing conditions in the community to set a baseline that can be used to compare progress over time and to inform community decisions for how the city chooses to prioritize climate actions. The data for existing conditions comes from Xcel Energy Community Energy Reports, the Minnesota Department of Transportation, the Department of Energy State and Local Energy Data (SLED) and Low-Income Energy Affordability Data (LEAD) tool, and the United States Census Bureau.

## Demographic Snapshot

The demographic information included in Table 1 comes from the American Community Survey five-year estimates from 2017. These data provide a snapshot of income, age, race, physical ability, language, and energy assistance eligibility in Red Wing. This information can be used to inform how initiatives can be designed to be accessible, beneficial, and equitable for all residents.

<b>INCOME</b>	The median household income in Red Wing is estimated at \$50,746; the Minnesota median household income is estimated at \$65,699.
<b>RACE</b>	The residents of Red Wing are 90% white alone, and 10% persons of color (where 4.2% identify as two or more races, 2% American Indian / Alaska native and 1.9% black / African American).
<b>AGE</b>	There were 21.3% of Red Wing residents who were 65 years or older in 2018, while 5.7% of residents were under the age of 5. Those ages 16 to 64 comprised 60.4% of all residents.
<b>MOBILITY/ ABILITY</b>	13.4% of Red Wing residents live with or experience limited mobility or ability (e.g., ambulatory limitations, varying levels of hearing or vision, or cognitive difficulty).
<b>HOUSEHOLDS AND TENURE</b>	There are 6,975 total households in Red Wing: 65.2% are owner-occupied and 34.8% are renter occupied. 62% of the housing in Red Wing (as of 2018) was single-family, while the remaining 38% was a combination of multi-unit (35.9%) and mobile homes (2.1%).
<b>% BELOW POVERTY</b>	16.1% of Red Wing residents and 9.9% of households were determined to be living below the federal poverty level.
<b>LANGUAGE</b>	97.9% of Red Wing residents over 18 speak only English. The next most commonly spoken language in Red Wing is Spanish.
<b>ENERGY ASSISTANCE ELIGIBILITY</b>	For Minnesota Households to qualify for energy assistance, they must earn less than 50% of the state median income. Using 2017 income estimates for Red Wing households, approximately 21.2% of households qualified for energy assistance.

Table 1: Red Wing Demographics. Source: American Community Survey, five-year estimates for 2017

# Energy Consumption and Buildings

Energy is used for space and water heating and cooling, ventilation, and the operation of lighting and appliances in buildings. Heating a building’s space and water comes most often from natural gas, while electricity is typically used for operating appliances, lighting, and cooling. Xcel Energy is the main electric and natural gas energy provider for Red Wing residents, businesses, and institutions. Dakota Electric Association serves a small percentage of city residents and businesses; those data are not included in this document.

## ENERGY USE IN RED WING

Xcel Energy provides both electric and natural gas services to most Red Wing residents and businesses. In 2018, electricity consumption accounted for 30% of Red Wing’s total building energy use, while natural gas consumption accounted for 70%. A significant increase in natural gas consumption appears in 2018, due to a combination of weather factors and data that were previously suppressed in 2016 and 2017. Unsuppressed data provide a more accurate representation of the total natural gas consumption in the city. Red Wing households each spent an annual average of \$1,796.78 on electricity and natural gas utility bills (\$1,119.49 on electricity and \$677.29 on natural gas). In 2018, more than \$20 million were spent on electricity and more than \$8 million on natural gas, citywide.

**Energy Consumption in Red Wing by Fuel and Sector**

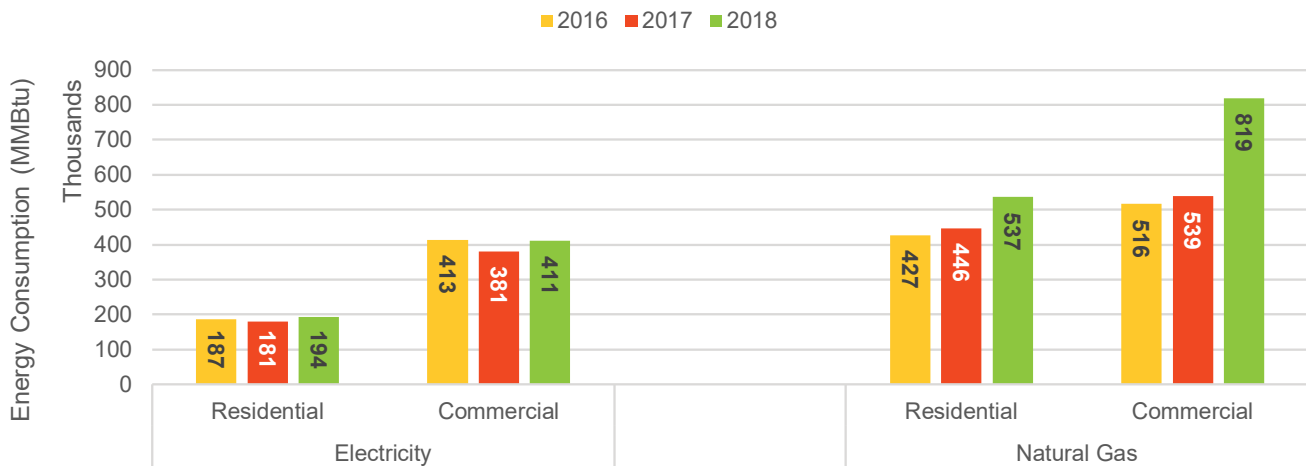


Figure 1: Energy Consumption by Fuel and Sector. Source: Xcel Energy Community Energy Reports for the years 2016, 2017, and 2018. Note that between 2017 and 2018, one commercial natural gas customer was included in reporting that was previously suppressed; leading to a significant increase in natural gas use between those years.

## GREEN WING ENERGY ACTION PLAN AND PROGRESS

In 2016, the city worked with Xcel Energy through the Partners in Energy (PiE) program on the [Green Wing Energy Action Plan](#) that sets goals to reduce energy usage and increase renewable energy across the city. The two main goals of the plan included engaging an additional 10% of residences (700 households) and 10% of small to mid-size commercial businesses (100 businesses) in Xcel Energy’s renewable energy and energy conservation programs from 2016 baseline participation.

The city reached its residential participation goals by 2018. In 2016, 735 residences participated in renewable energy or energy conservation programs. An additional 700 residences were needed to meet the PiE goals, which the city surpassed with 2,307 additional residential program participants by 2018. About 96% of additional residential participants subscribed to community solar gardens. Residential participation across these programs in 2018 amounted to 3,203.7 MWh of electricity.

The city did not reach its 2018 business participation goal. In 2016, 72 commercial businesses participated in programs when an additional 100 business participants were needed to meet the city’s goals. Commercial business participation increased by 68 businesses by 2018. An additional 32 businesses, or 30% of additional businesses, are needed to reach the goal. Commercial participation across these programs in 2018 amounted to 19,841.5 MWh of electricity.

Renewable energy purchasing programs allow homes and businesses to support renewable energy by paying a premium on their monthly bill that goes toward the purchase of renewable energy credits, typically from wind or solar. Participation in renewable energy purchasing programs (including Xcel Energy’s Renewable\*Connect and WindSource), as well as generation of renewable energy in Red Wing, has grown significantly since 2016. This is largely due to the popularity of community solar garden subscriptions. Total participation (among residential and commercial energy users) across these programs in 2018 totaled 23,045 MWh of clean electricity.

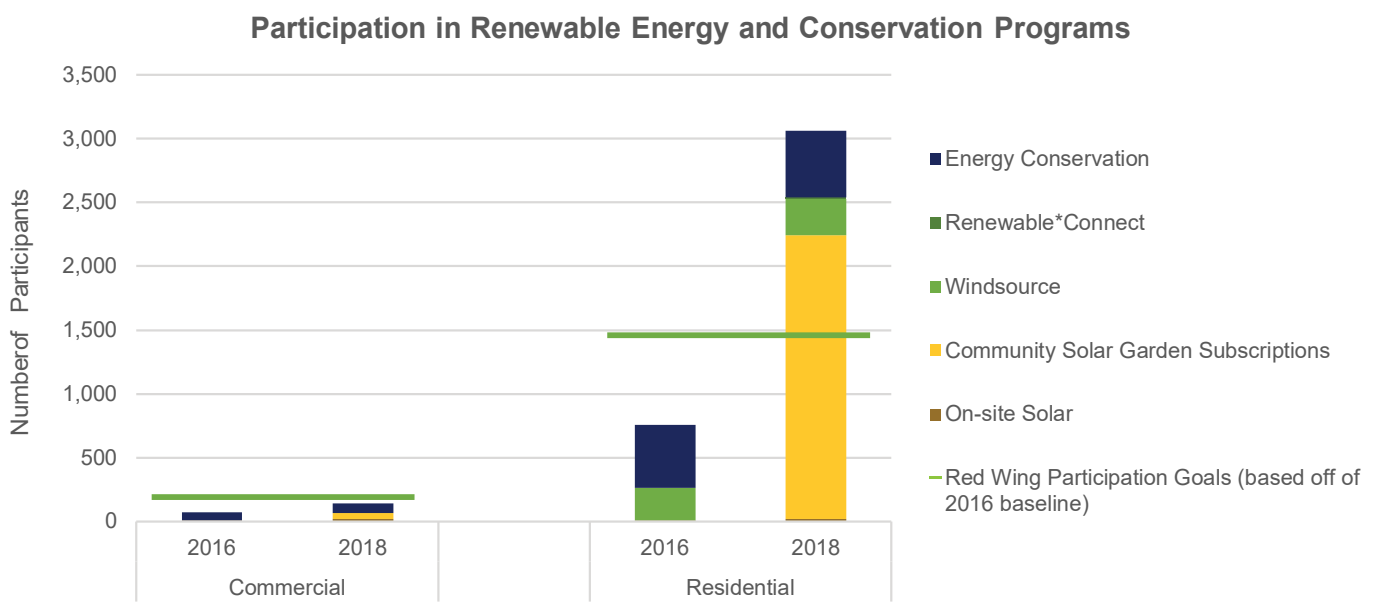


Figure 2: Participation in Renewable Energy and Conservation Programs. Source: Xcel Energy Community Energy Reports for the years 2016 and 2018. Residential participation goal of 1,400 households, commercial goal of 100 additional businesses.

## ENERGY BURDEN AND ENERGY SECURITY

Energy burden is the proportion of household income that is used to pay for energy utility bills - both electric and natural gas. The average energy burden for all Red Wing residents in 2018 was 3%. This proportion is consistent with the average energy burden for Minnesota households, which is 3.5%. However, the energy burden is greater for households with lower incomes. For Red Wing residents with an income of less than 30% area median income (AMI), energy burden was significantly higher (8% for renters and 13% for homeowners). Figure 3 shows the average annual energy costs and associated energy burden for Red Wing residents. Residents are grouped by income bracket (measured as % AMI) and whether they rent or own their home.

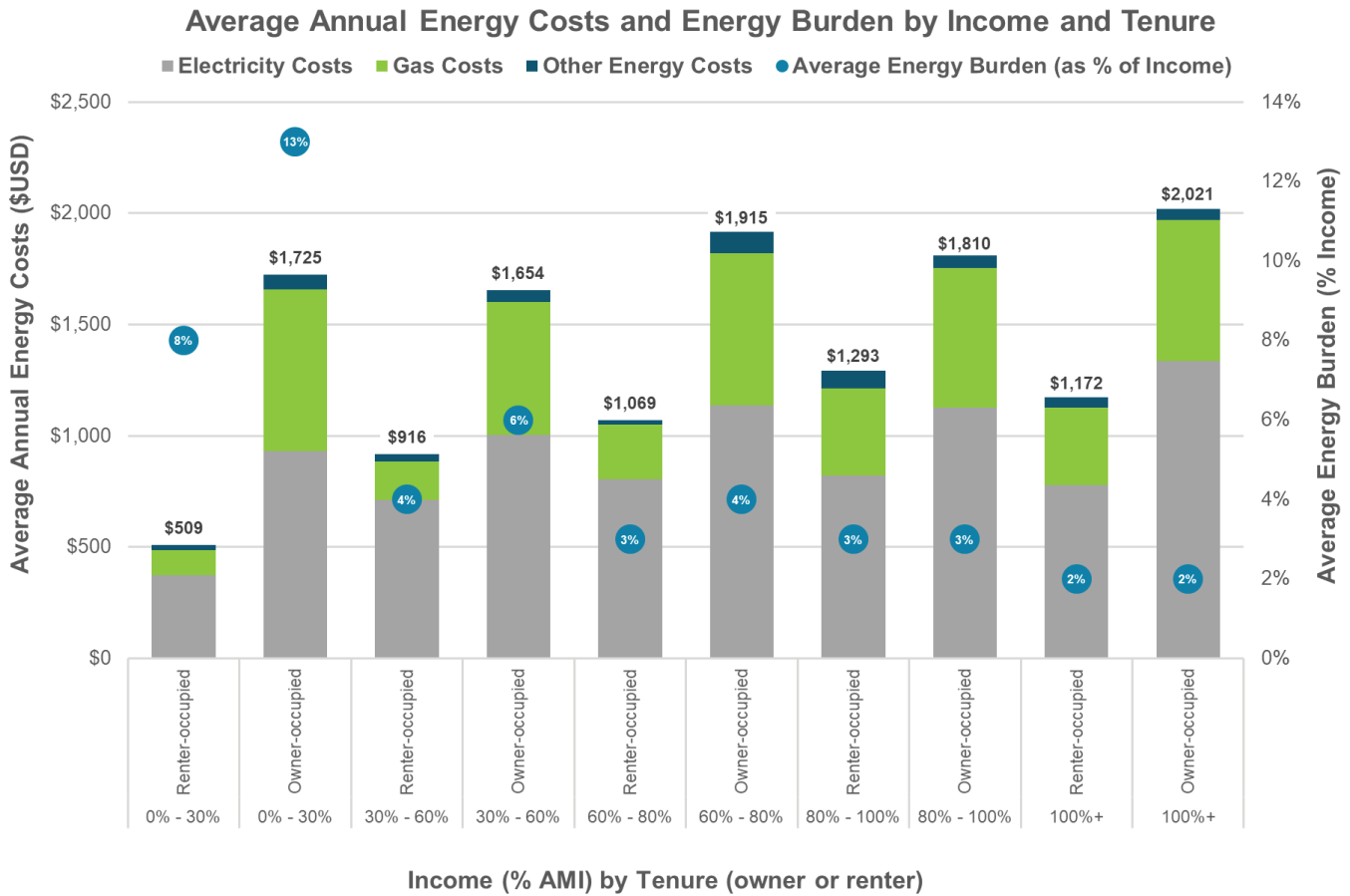


Figure 3: Average Annual Energy Costs and Energy Burden. Source: U.S. DOE LEAD (Low-Income Energy Assistance Data) for 2016

# Transportation

Transportation energy is almost entirely attributed to surface travel from cars and trucks and is estimated by the vehicle miles traveled (VMT) within the city boundaries, regardless of through traffic. Energy for vehicle travel primarily comes from liquid fuels like gasoline and diesel, though electric vehicles are increasingly a part of the vehicle mix. Other forms of in-boundary transportation include public transit, biking, walking, and wheeling (e.g., scooters, wheelchairs, or other mobility devices).

## TRANSPORTATION IN RED WING

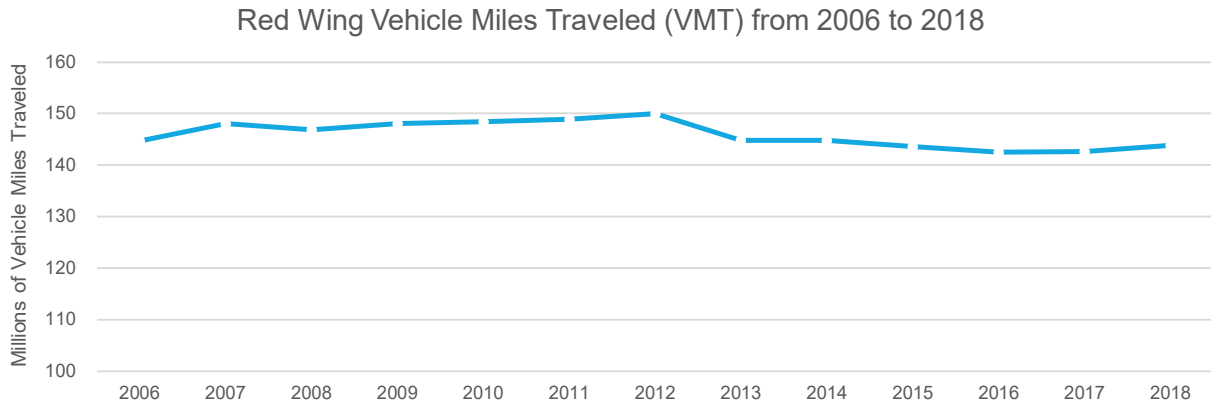


Figure 4: Vehicle Miles Traveled from 2006 to 2018. Source: Minnesota Department of Transportation (2006-2018). Note that data is not available for 2015, an average of 2014 and 2016 was used.

Vehicle miles traveled (VMT) is a measurement of distance driven in a vehicle within city boundaries. Over the past twelve years, VMT was rising steadily between 2006 and 2013, and then declined approximately 5% between 2012 and 2016. VMT increased slightly between 2017 and 2018. According to the US Department of Energy State and Local Energy data, there were an estimated 20,000 registered light-duty vehicles in Red Wing, averaging around 22.0 MPG as of 2016. Of those vehicles, 83% were gasoline, 11% were flex fuel, 4.1% were diesel or biodiesel, 1.1% were hybrid or electric, and 0.8% were unknown.

Commuting in Red Wing is made up primarily by driving alone in a car, truck, or van - about 82%. An additional 8% of commuting trips were carpools, with walking, public transportation, and working from home accounting for less than 3.9% of commuting trips. The mean commute time to work is 20.9 minutes. The bus service in Red Wing is operated by Hiawathaland Transit and includes three bus routes across the city. Additionally, there is an Amtrak station in Red Wing that is on the Empire Builder route between Seattle and Chicago.

### 2018 Commuting Characteristics

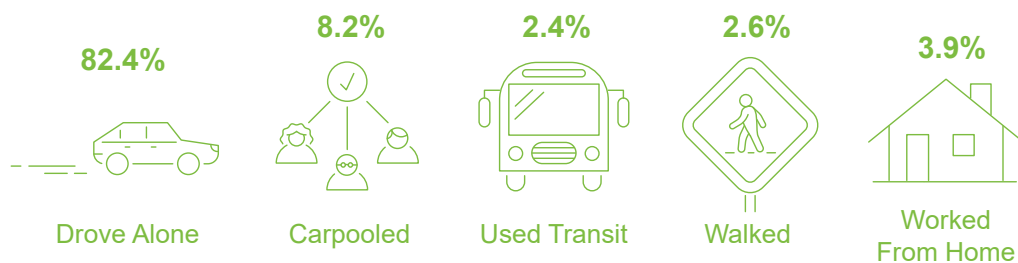


Figure 5: Commuting Types and Rates. Source: ACS five-year estimates for 2018 commuting behavior; note, total does not include all modes of transportation and therefore does not equal 100%.



# Waste

Solid waste consists of post-consumer materials including food waste, plastics, paper, metals, construction debris, and other materials. The data collected do not consider the manufacturing and usage of the product being discarded, but rather the volume of waste generated and the breakdown of how waste is processed, including recycling, composting, and resource recovery.

## WASTE IN RED WING

All residential waste and the majority of commercial waste generated in Red Wing is delivered to the City’s Waste Campus where it is processed to remove recyclable materials. The processing measures also remove non-processible materials such as lead acid batteries and other hazardous materials. The processed waste is then shredded to meet fuel size requirements to become refuse derived fuel (RDF). This RDF is then sent to the Xcel Energy Red Wing Steam Plant to generate electricity. Remaining materials that cannot be shredded are taken to a mass burn facility, the Olmsted County Waste to Energy Facility, where electricity is also generated by incineration. Over 80% of the waste that arrives at the Red Wing Waste Campus is used to generate electricity.

In September 2019, with a goal to increase target recyclables collected, the city transitioned to single-stream recycling collection using 96-gallon carts that are picked up every other week. After curbside collection the mixed recyclables are taken to a Material Recovery Facility or “MeRF” where the materials are sorted by type and taken to respective end-manufacturing markets located both regionally and interstate. The implementation of this program will help to reduce the amount of traffic on the streets by reducing the number of trucks used for collection from 5 trucks to 2 trucks while providing a greater range of recyclable materials. Through a robust educational campaign the city has been able to both increase participation and reduce contamination in its existing recycling program citywide.

In Red Wing, total waste generation and the proportion being recycled has fluctuated between 2016 and 2018. Total volume of solid waste has increased between 2016 and 2018, from 13,198 tons to 14,502 tons with a slight decrease in 2017. In both 2016 and 2018, about 70% of total tons of waste were incinerated in the resource recovery facility and 30% of total waste was recycled. In 2017, however, the proportion of waste being incinerated was 80% and recycled was 20%, but the total tonnage was lower than 2016 or 2018.

Although Red Wing does not currently collect organics, there are opportunities to use organic material in environmentally beneficial ways. Post-consumer organic materials (e.g., food waste) can be composted to create a material rich in nutrients that can help restore unhealthy soils and protect surface water. There are also opportunities to generate electricity, gas, and thermal energy from anaerobic digesters, which breakdown organic material and utilize the methane that is released.

### Red Wing Waste Generation (2016 - 2018)

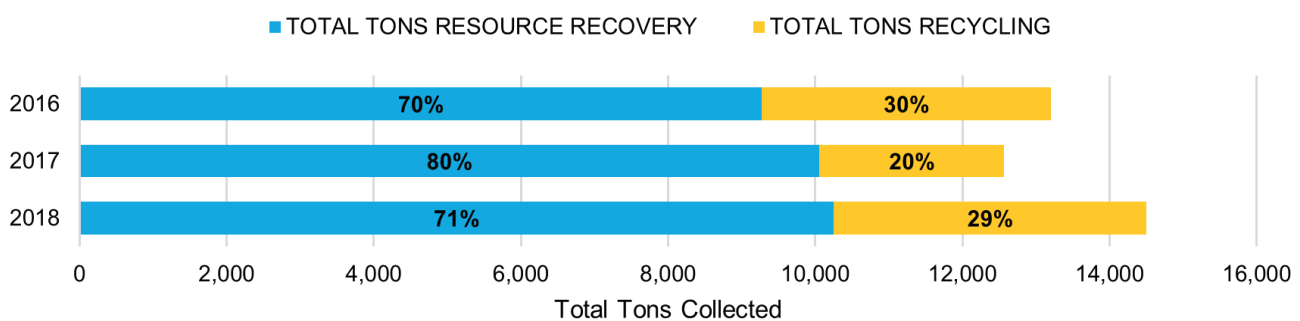


Figure 6: Waste Generation. Source: Goodhue County Solid Waste Division for years 2016, 2017, and 2018. Accessed March 2020

# Renewable Energy Resources

## SOLAR RESOURCE

A community's solar resource is the amount of sunlight that can be captured and converted to electricity. Using the solar suitability app from the University of Minnesota, the solar resource was calculated for rooftops in Red Wing. The total capacity of the economic rooftop solar resource in Red Wing is 85.5 MW, equal to approximately 63% of all the electricity consumed in the city (note: this is an upper limit and does not consider individual site limitations due to roof structure, ownership, or local regulations that might limit solar installations). Additional solar could be captured through ground-mount systems, green power purchase programs (e.g., Renewable\*Connect) or community solar gardens.

Table 2 breaks down the solar potential for all of Red Wing, for building rooftops, and for the top 10 building rooftops in the city by both the potential capacity of installed panels, as well as the generation likely associated with that installed capacity.

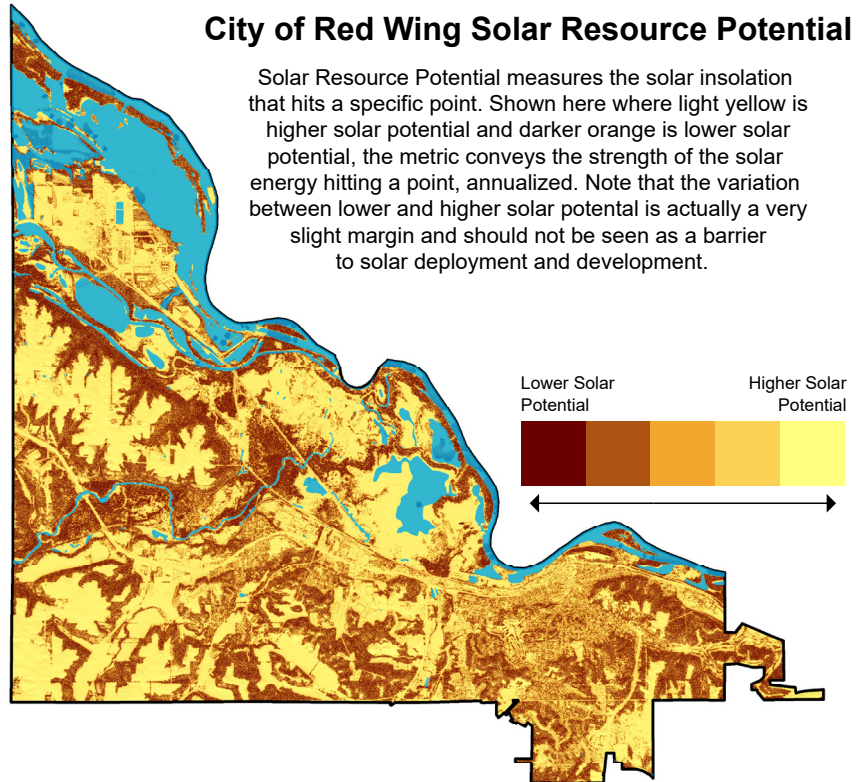


Figure 7: Solar Resource Potential. Source: University of Minnesota U-Spatial Solar Raster Data (2008 - 2013), figure and calculations by Great Plains Institute

	PANEL CAPACITY MW	PANEL GENERATION MWH/YR
<b>TOTAL SOLAR RESOURCE POTENTIAL (ALL LAND AND BUILDINGS, EXCLUDING WATER)</b>	3,467 MW	4,507,725 MWh/year
<b>TOTAL BUILDING ROOFTOP RESOURCE POTENTIAL</b>	85 MW	111,134 MWh/year
<b>TOP 10 BUILDING ROOFTOPS RESOURCE POTENTIAL</b>	14 MW	18,522 MWh/year

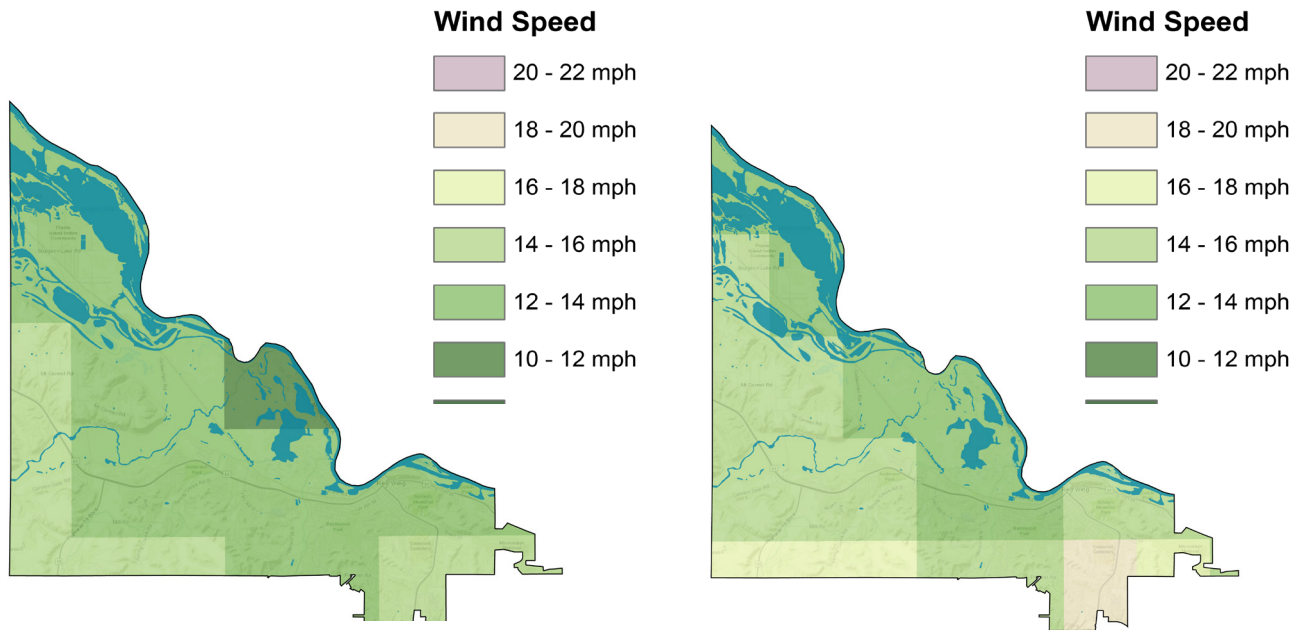
Table 2: Solar Resource Potential by Type. Source: University of Minnesota U-Spatial Solar Raster Data (2008 – 2013), figure and calculations by Great Plains Institute

## WIND RESOURCE

A community's wind resource is measured by the wind speeds at turbine tower heights of both 80-meters and 100-meters. As a rule of thumb, wind turbines operate best with minimum speeds of 12 mph; sufficient wind speeds cover the entire city at 100 meters, and most of Red Wing (except the downtown, river-adjacent area) at 80 meters. Using the Minnesota Department of Commerce wind speed maps, it appears there is a significant wind resource in the Red Wing area. Wind speed is not the only consideration for a quality wind resource; other considerations include distance to nearby structures and trees, impact on migratory birds, soil conditions, landscape, protected areas, and community character. There are a number of small wind energy systems in the area surrounding Red Wing, though none are currently operating within the city.

### 80-meter wind speeds

### 100-meter wind speeds



*Figure 8: Wind Resource Potential. Source: Minnesota Department of Commerce wind raster data (2016), graphics by Great Plains Institute*

Additional wind power is available through green power purchase programs like WindSource® or Renewable\*Connect. Additionally, renewable energy credits that are tied to wind projects can be purchased through carbon offset sites like Terrapass or Arcadia.

Renewable energy resources (e.g., solar and wind) contribute to accelerating the decarbonization of the electric grid, helping to make electricity a cleaner source of energy. These forms of energy can also have significant local economic impact through lower electric bills and job creation.

Understanding how energy is used in the community and the availability of renewable energy options, provides a foundation for decision-making around how energy could be used more efficiently and where it could come from. In the context of climate mitigation, it is also important to understand the greenhouse gas emissions associated with community energy use. The next section illustrates the breakdown of GHG emissions in Red Wing.



## GREENHOUSE GAS EMISSIONS INVENTORY

A greenhouse gas inventory includes emissions that result from building energy use, vehicle travel, and waste within the community. For Red Wing, building energy use emissions means the greenhouse gases (GHGs) that result from electricity consumption and natural gas use in commercial and residential buildings, as well as industrial processes. Travel emissions come from combustion vehicles, such as cars and trucks that run on liquid fuels. Waste emissions are generated through the disposal process and captured at the final destination — often landfills or incinerators. In Red Wing, waste that is not recycled, reused, or composted is delivered to a resource recovery center where it is incinerated to generate electricity.

In 2018, the total community-wide emissions in Red Wing amounted to 204,500 tonnes of CO<sub>2</sub> equivalent (12.4 tonnes/person). The largest share of emissions came from building energy use (natural gas and electricity), which make up 66% of Red Wing's total emissions. The travel sector makes up the next largest source of emissions with 32% of total emissions. While waste makes up 2% of total emissions attributed to the community. This inventory only accounts for post-consumer waste; emissions generated in the production and distribution of goods is much greater and should be a consideration in waste strategies.

Building energy emissions can be further broken down by energy type and by sector. Electricity makes up 47% of building energy emissions and natural gas makes up 53%. Divided by sector, 63% of building emissions come from commercial/industrial buildings, while 37% come from residential buildings.

In homes, the largest energy users are typically space and water heating systems. In Minnesota, the majority of homes are heated using natural gas furnaces and boilers. Electric appliances, like refrigerators and televisions, also account for large amounts of energy use.

Many of the same energy uses occur in commercial buildings, but typically on a greater scale than residential buildings. Industrial facilities tend to have higher energy intensity for various processes as compared to commercial uses. In some cases, the manufacturing processes at industrial facilities (e.g. production of cement) can also generate emissions.

Decarbonizing buildings requires minimizing or eliminating fossil fuel inputs. This can be done through generating electricity with low- or no-carbon sources (e.g., renewable energy), deep energy efficiency retrofits, and alternatives to natural gas (e.g., fuel switching, other thermal technologies). Finding clean solutions for space heating in an extremely cold climate and for industrial processes are among the greatest challenges to building energy decarbonization in the Midwest.

Travel emissions account for 32% of total community-wide emissions in Red Wing, with approximately 60,590 tonnes of CO<sub>2</sub>e — or 3.7 tonnes per person — generated annually. These emissions come from on-road combustion vehicles like cars, trucks, and buses. Emissions are calculated using the vehicle miles traveled within the boundary of the community and the make-up of vehicles on the road. Opportunities to reduce emissions from vehicles include increasing mode-shift alternatives through improved public transportation and changes to land use that better accommodate biking and walking; electrifying vehicles; and increasing vehicle fuel efficiency.

Waste is the smallest emissions category, comprising 2% of total community-wide emissions. These emissions primarily come from the landfilling and incinerating processes. Opportunities to reduce waste from emissions include, increased recycling rates, availability of composting, and strategies to shrink the waste stream.

Community-wide emissions can also be viewed at the individual level by dividing total emissions by the population of Red Wing. Figure 10 illustrates the per-person emissions for 2016 through 2018. Per-person emissions increased by about 1.5 tonnes of CO<sub>2</sub> in 2018. This was primarily due to the increase in building energy emissions, which likely reflects unsuppressed data rather than a significant growth in energy consumption.

## GREENHOUSE GAS EMISSIONS RED WING

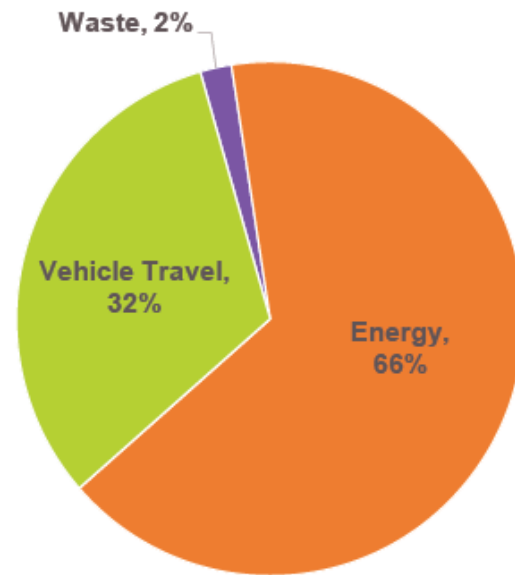


Figure 9: Greenhouse Gas Emissions breakdown, 2018. Source: Regional Indicators Initiative, 2018

Individuals can use this information to consider taking action to decrease personal carbon footprints. Most individuals will be able to impact their travel and home emissions through personal actions and decisions, while other emissions will need to be addressed through community-wide strategies and policies.

## RED WING PER CAPITA GREENHOUSE GAS EMISSIONS (2016 - 2018)

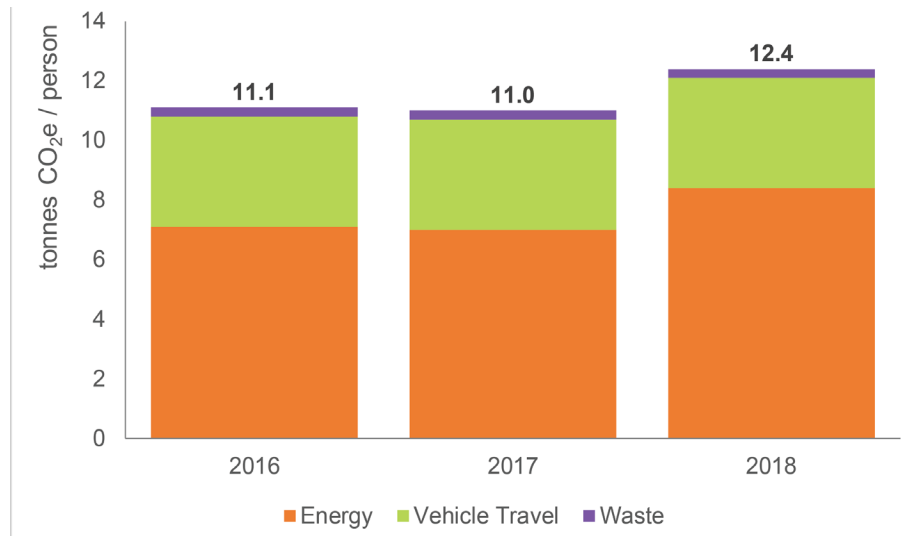


Figure 10 Greenhouse Gas Emissions Source: Regional Indicator Initiatives, 2018

Using projected population and job growth, as well as the utility resource plan and anticipated building code energy requirements, community-wide emissions can be forecast to understand future emissions. Figure 11 depicts the GHG emissions forecast for Red Wing. The solid line across the top represents the business-as-usual (BAU) scenario. The BAU assumes no changes are made that impact emissions between now and 2040, and emissions would remain relatively flat. However, Xcel Energy has announced a plan to be carbon free by 2050 and updates to the energy code will impact new construction. These factors will impact both the carbon intensity of electricity and the efficiency of buildings. These anticipated reductions are reflected in dashed line. The remaining emissions will come from travel (47% of remaining emissions), natural gas (40%), electricity (9%), and waste (4%).

## CITY OF RED WING GREENHOUSE GAS EMISSIONS

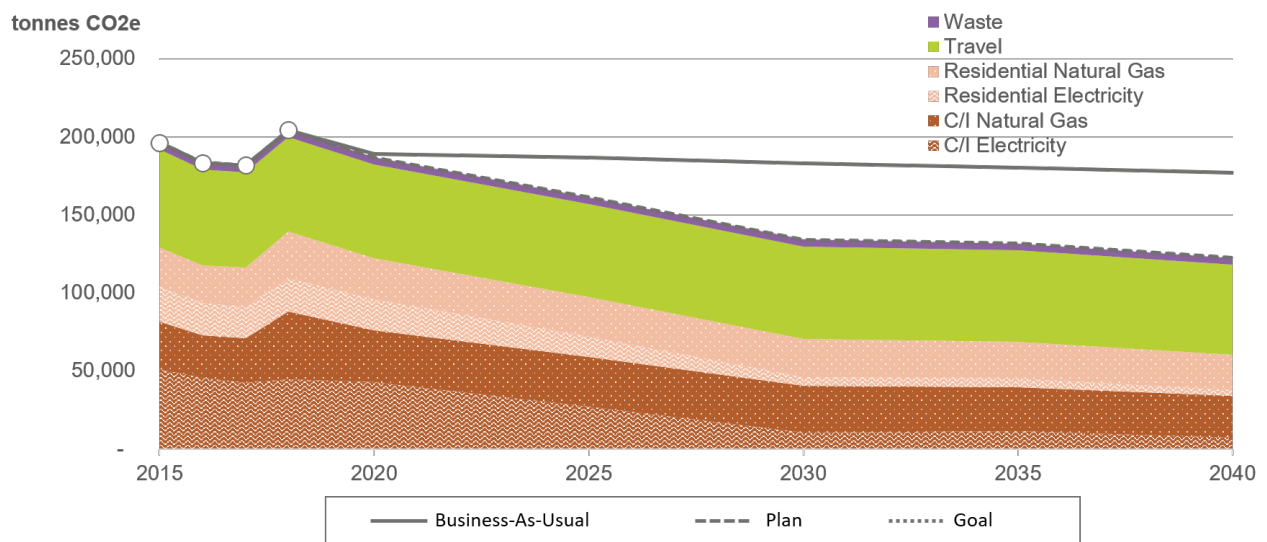


Figure 11 Source: Regional Indicator Initiatives

# CURRENT PROGRAMS, POLICIES, AND GOALS

Red Wing has been a long-time leader in environmental and energy initiatives. In the mid-1980s, the Red Wing Community Energy Program was initiated, launching a program that would lead to energy savings in municipal buildings and streetlights as well as the installation of solar panels. In 2016, the city, along with the school district, collaborated to support the development of one of the largest community solar gardens in the state.

## GREENHOUSE GAS EMISSIONS THROUGH 2040 RED WING

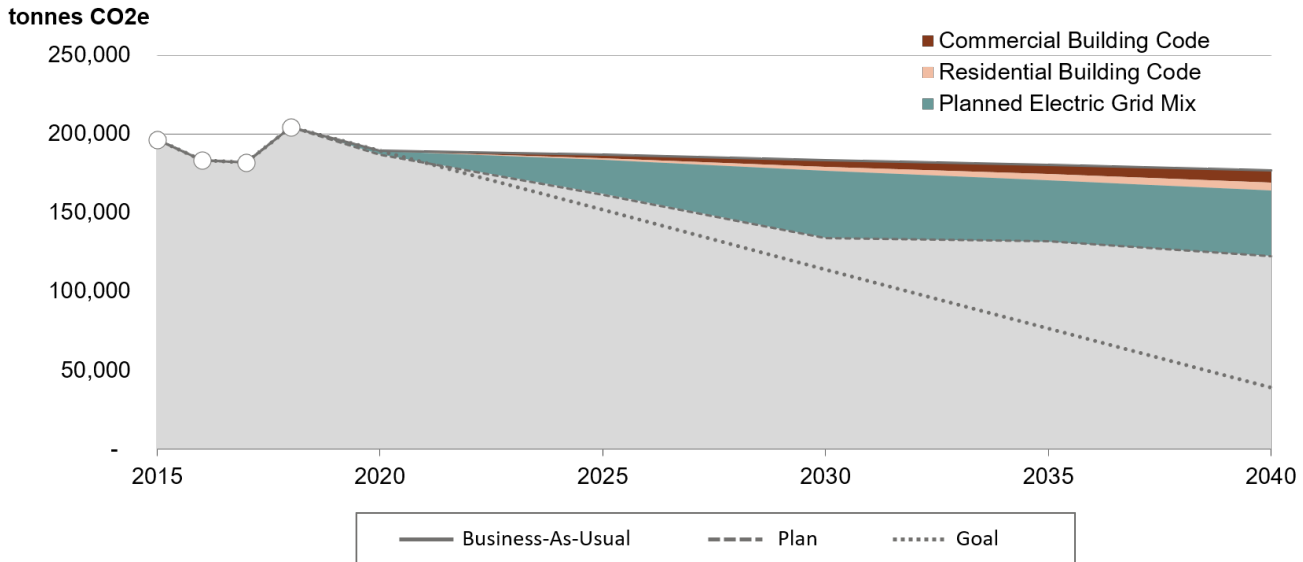


Figure 12 Source: Regional Indicator Initiatives

In its 2040 Comprehensive Plan, Red Wing established a goal to reduce community carbon emissions by 80% on or before 2040. This goal is reflected in dotted line in Figure 12. The gray area above the dotted line represents the emissions that will need to be reduced by community-wide effort. These emissions primarily come from natural gas and travel, with a small amount of waste and electricity emissions. The city also has more targeted goals aimed at reducing emissions through efficiency, renewable energy, and transportation initiatives. These goals are included below.

Building Energy	Achieve 100% of the city's total municipal electricity consumption from solar by 2020
	Achieve 100% renewable electric energy for residential/commercial use by 2040
	Establishing a green building policy for new and renovated buildings
	Reducing energy consumption in commercial and industrial buildings by 30% by 2030
Travel	Reducing energy consumption in residential buildings by 35% by 2030
	Achieve 50% of local vehicle use with either electric or non- or low-carbon fuels by 2030
Waste	Continue to implement the city's Complete Street Policy and Bicycle and Pedestrian Master Plan
	Substantially reduce solid waste going into landfills or incinerators

Finally, to the extent possible, the city should leverage existing programs, policies, and plans to advance climate action. Table 4 captures many of the on-going activities the city is already engaged in that should be considered as the five-year initiatives are developed and implemented.

Program / Policy / Plan	Description	Highlights	
Energy	<a href="#">Green Wing Energy Action Plan</a>	The City engaged with Xcel Energy through the Partners in Energy process to create the 'Green Wing' Energy Action Plan in 2016.	Red Wing surpassed the residential participation goal of adding 10% new households with an additional 2,307 households participating in programs.
	<a href="#">PACE Financing</a>	PACE financing for eligible properties energy efficiency upgrades and renewable energy installations.	Two solar projects in Red Wing used PACE financing in downtown; financed between \$55,000 and \$70,000 each.
	<a href="#">SolSmart</a>	SolSmart is a national designation program that makes it easier to go solar by reducing soft costs.	Red Wing is a SolSmart Silver designated community.
Travel	<a href="#">Complete Streets Policy</a>	The Complete Streets Policy encourages multi-modal transportation, particularly biking, walking, and taking transit	The policy has been expanded upon through the Mayor's Task Force on Streets & Sidewalks pedestrian plan and policy report
	<a href="#">Bicycle and Pedestrian Plan</a>	Adopted in 2011, aims to enhance the bicycle and pedestrian environment in Red Wing, with a goal of the city being known as active, fitness-friendly, bicycle-friendly, and walkable.	Red Wing has paved bike paths and trails and a shared bike rental program located at the St. James Hotel in downtown Red Wing.
	<a href="#">Cities Charging Ahead!</a>	Cities Charging Ahead was a cohort of cities in Minnesota focused on expansion of electric vehicles.	Red Wing installed the first municipal Level 3 DC Fast Charger charging station in Minnesota.
Waste	<a href="#">Solid Waste Master Plan</a>	The Goodhue County Solid Waste Master Plan includes a goal to continue implementing its recycling program over the next ten years, promote recycling through the Minnesota Waste Wise program.	Since recycling collection began in 1994, participation in recycling programs has resulted in an increase in the volume of waste being diverted from incineration to be recycled instead.
Sustainability & Equity	<a href="#">GreenStep Cities</a>	GreenStep Cities is a voluntary challenge and assistance program in Minnesota that helps cities achieve their sustainability goals	Red Wing is a Step 5 city, the highest step a city can achieve in the GSC program that recognizes a city has tracked and improved upon its sustainability goals.
	<a href="#">Racial Equity Plan</a>	Adopted in 2017, the Racial Equity Plan includes outcomes and action that hold the city accountable to advancing fairness and justice.	The Racial Equity Plan was incorporated into the city's 2040 Comprehensive plan

Table 4: Plans, Policies, and Programs in Red Wing



# FIVE-YEAR WORK PLAN

The following work plan is intended to get Red Wing started on a series of initiatives that will enable the city to begin to make community-wide emissions reductions over the next five years. There are five strategies to reduce emissions across building energy use, transportation, and waste. Each strategy has at least two initiatives for the city to implement in this time frame, as well as target emissions reductions and co-benefits. There is an additional strategy for city operations. This strategy supports both internal emissions reductions as well as sharing resources and communicating progress externally. Implementing this work plan is aimed at reducing community-wide greenhouse gas emissions 9% over the next five years. When combined with the impact of Xcel Energy's changing electricity grid mix and ongoing code enforcement for new construction, the reduction totals 21%.

## Strategy I: Increase Building Efficiency

Building energy use is responsible for 66% of total community-wide emissions in Red Wing. Commercial and industrial buildings account for 63% of building energy emissions. These emissions can be decreased through a combination of energy efficiency, fuel switching, and renewable energy initiatives.

### Initiative 1: Adopt a Commercial Building Benchmarking and Transparency Policy

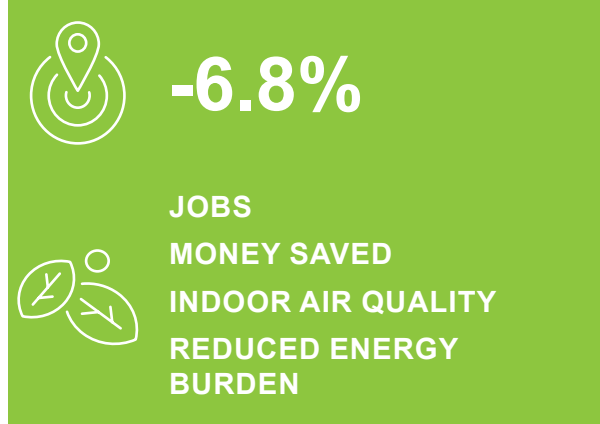
**Description:** Building energy benchmarking and transparency policies help building owners and operators track and manage building energy consumption. These policies focus on buildings of certain use types and those that are over a specified size threshold. The Efficient Building Collaborative (EBC) offers support to adopt and implement a mandatory or voluntary policy. The city should utilize no-cost technical assistance from the EBC to adopt and implement a policy that targets commercial buildings 15,000 ft<sup>2</sup> and larger.


**Lead:** Community Development / Sustainability Commission


**Timeline:** Fall 2020 — on-going

#### Actions:

1. Participate in the Efficient Building Collaborative, a program offered by Hennepin County and the Minnesota Pollution Control Agency that supports Minnesota cities with the development of a building energy benchmarking program. The EBC walks the city through 1) creating a policy framework, 2) developing a stakeholder engagement plan, and 3) implementing an operations plan to run the benchmarking program.
2. Adopt a building energy benchmarking policy that supports the largest commercial users with tracking energy use and working to meet the city's efficiency and greenhouse gas emissions goals.
3. Implement the energy benchmarking policy beginning in June of 2021.
4. Share an annual report on the city website to demonstrate building energy use and successful efficiency improvements.



 **-6.8%**

 **JOBS**  
**MONEY SAVED**  
**INDOOR AIR QUALITY**  
**REDUCED ENERGY BURDEN**



## Initiative 2: Expand the Green Wing Building Energy Challenge for businesses

**Description:** Under the Partners in Energy Green Wing Energy Action Plan, Red Wing implemented a building challenge to increase participation in energy efficiency and renewable energy programs among small- and mid-size businesses. The city should expand and incorporate the Green Wing Building Energy Challenge into the implementation of the Building Benchmarking program. The city should provide resources, incentives, and recognition to buildings that achieve energy savings that help to meet the community energy and climate goals. Under this expansion, the city should encourage fuel switching (i.e., electrify natural gas appliances) to move toward decarbonizing space and water heating.

**Lead:** Community Development / Sustainability Commission

**Timeline:** September 2021 — on-going

### Actions:

1. As part of the building energy benchmarking program, compile resources for businesses to take advantage of energy efficiency and renewable energy financial incentives and financing opportunities.
2. Establish an annual recognition program to encourage more businesses to reduce energy use and greenhouse gas emissions through efficiency, fuel switching, and renewable energy.
3. Track and share successes via the city's climate resource page, newsletters, social media, and other communication channels.

## Initiative 3: Expand the Green Wing Building Energy Challenge for residences

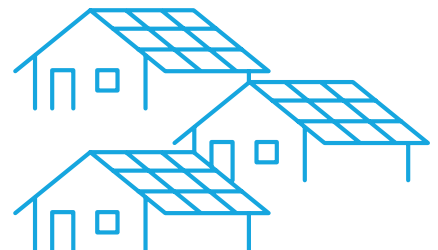
**Description:** Under the Partners in Energy Green Wing Energy Action Plan, Red Wing implemented a residential building energy challenge to help community members save energy by connecting with local energy programs. The city should expand this challenge with a focus on energy-burdened households: those households with a higher percentage of total income that is used to pay for energy bills. In addition to efficiency measures, the city should encourage residents to switch natural gas water and space heaters to electric when feasible.

**Lead:** Community Development / Sustainability Commission

**Timeline:** Spring 2020 — 2025

### Actions:

1. Continue the outreach and promotion campaign established under the Green Wing Energy Action Plan, in English and Spanish.
2. Develop a fund to provide additional financial incentives for energy efficiency upgrades and fuel switching for households with low-to-moderate income to reduce energy burden.
3. Track and share successes via the city's climate resource webpage, newsletters, social media, and other communication channels.



## Strategy II: Increase Adoption Rate of Electric Vehicles

Vehicle travel makes up 32% of total emissions in Red Wing. Options to reduce emissions in vehicles are to improve vehicle efficiency, change the fuel type to zero carbon emissions, or decrease the amount of driving. It is recognized that many people will need to continue to drive in Red Wing and that emphasis should be placed on encouraging residents to purchase cleaner vehicles.

### Initiative 1: Incorporate elements of electric vehicle-ready development into zoning ordinance

**Description:** Red Wing has already made strides in electric vehicle charging and EV upgrades to the municipal fleet. Additional ordinance updates can ensure that electric vehicles are accessible and available to Red Wing residents by creating EV-ready development standards. This can be done by incorporating such standards into the city's zoning ordinance.

**Lead:** Community Development / Advisory Planning Commission

**Timeline:** Fall 2020 — Spring 2021

#### Actions:

1. Participate in City's Charging Ahead 2.0 in the Fall of 2020 to take advantage of forthcoming funds available for EV charging infrastructure as well as work on increasing EVs for city fleets and EV-ready standards for private development.
2. Identify opportunity for electric vehicle sharing, charging infrastructure, and purchase options for residents with low-to-moderate incomes.

### Initiative 2: Education and engagement

**Description:** Provide resources to businesses and residents that demonstrate the benefits of owning an electric vehicle. Ensure communication and materials tie back to the city's climate goals. These materials should be made available on the city's website as well as at community events and other venues, in English and Spanish. Host ride and drive events that allow people to experience electric vehicles.

**Lead:** Community Development / Sustainability Commission

**Timeline:** Spring 2021 — on-going

#### Actions:

1. Establish an EV task force that will be responsible for education and engagement around making electric vehicles more accessible to all residents.
2. Share events, promote success, and provide resources to residents and businesses on the city climate resource webpage, newsletters, social media, and other communication materials.
3. Coordinate with local schools, delivery services, and others to promote electrification of heavy-duty vehicles, like school buses.



**-0.5%**



**MONEY SAVED  
AIR QUALITY  
NOISE REDUCTION**



## Strategy III: Reduce Annual Vehicle Miles Traveled 2% by Fossil Fuel Vehicles

Vehicle travel in Red Wing accounts for 32% of the city's greenhouse gas emissions. Reducing transportation emissions requires switching fuel type, fuel efficiency, and mode shift – switching from driving to other forms of transportation. Widespread mode shift can be facilitated by building out infrastructure and improving non-vehicle transportation services to increase usability, reliability, access, and affordability of non-single-occupancy-vehicle travel. The COVID-19 pandemic will likely alter the way people interact with buildings and change commuting behavior.



**-0.6%**



**SAFER STREETS  
AIR QUALITY  
NOISE REDUCTION  
STORMWATER  
URBAN HEAT ISLAND**

### Initiative 1: Adopt a Complete Green Streets Policy

**Description:** The city adopted a [Complete Streets Policy Resolution](#) in 2011. The policy focuses on improving streets to better accommodate a range of users including vehicles, pedestrians, bicyclists, and transit riders. The addition of green infrastructure (trees, landscaping, and stormwater systems) would provide additional benefits to the city such as reduced stormwater runoff, natural carbon capture and storage, shading, wildlife habitat, and a more inviting streetscape. In the [2016 Pedestrian Plan & Policy Report](#), a lack of data and a decision tool were cited as barriers to broader construction of complete streets.

**Lead:** Community Development / Public Works – Engineering Department

**Timeline:** Spring 2021 — 2023

#### Actions:

1. Review existing complete streets policy to identify how green and/or living streets elements can be incorporated, especially in areas with low tree canopy coverage; update and adopt policy.
2. As part of the updated policy, establish a process for identifying which street reconstruction projects should follow the new policy, especially in consideration of equity and safe routes to school.

### Initiative 2: Encourage non-personal fossil fuel vehicle travel

**Description:** Decreasing VMT in Red Wing requires an increase in public transit use, biking and walking, and telecommuting among residents. Hiawathaland operates the bus system within Red Wing. Improved biking/walking facilities and access to co-working spaces will help facilitate changes in commuting behavior. Actions should consider emerging technologies and behavior change resulting from COVID-19.

**Lead:** Public Works / Sustainability Commission

**Timeline:** Fall 2020 — ongoing

#### Actions:

1. Collaborate with other cities that Hiawathaland serves, such as Northfield and Faribault, to discuss reliability, accessibility, and other recommended improvements to the transit service.
2. Engage residents whose commute has been impacted by COVID; identify opportunities for co-working spaces within Red Wing to reduce long commutes to destinations outside the city.

## Strategy IV: Increase Renewable Energy (+2.5 MW solar and 5% green power purchase)

Although the electricity grid is increasingly becoming cleaner, additional renewable energy development can accelerate decarbonization and provide local economic benefits. Currently, the best opportunities for renewable energy in Red Wing are through on-site solar installations, community solar garden subscriptions, and green power purchase programs. To maximize the impact of renewable energy, energy efficiency strategies should be pursued concurrently.

### Initiative 1: Expand access of renewable energy to households with low-to-moderate incomes to reduce energy burden

**Description:** There are multiple incentives available that are aimed at removing barriers for residents with low-to-moderate incomes interested in participating in clean energy. Increasing access to clean, affordable energy can help to reduce energy burden while contributing to a cleaner electric grid mix.

**Lead:** Community Development / Sustainability Commission

**Timeline:** Spring 2021 — 2023

#### Actions:

1. Compile resources for low-to-moderate income financial incentives offered by Xcel Energy and share them on the city's climate webpage. Conduct outreach and engagement efforts with impacted communities.
2. Partner with local organizations to conduct outreach and sign up residents with low-to-moderate incomes for clean energy programs including community solar subscriptions and rooftop solar. Ensure program materials are available in English and Spanish.
3. Establish a fund that can be used to provide additional incentives for participation in clean energy to residents to with low-to-moderate incomes.

### Initiative 2: Achieve 2.5 MW of solar capacity through on-site solar and/or CSG subscriptions

**Description:** Current on-site solar energy systems and community solar garden subscriptions amount to 18.9 MW of solar capacity. Residents and business owners should continue to increase their participation in renewable energy programs. The city should expand the Green Wing Energy challenge to grow renewable energy participation (either through CSG subscriptions or on-site solar installations) by 2.5 MW over the next 5 years. As stated above, the city should prioritize low-to-moderate income households in accessing increased solar energy capacity.

**Lead:** Community Development / Sustainability Commission

**Timeline:** Spring 2021 — 2023

#### Actions:

1. Utilize the [Solar Deployment Strategy](#) model to identify programs and incentives that will maximize participation in on-site and community solar gardens.
2. Promote solar resources, opportunities, and updates on the city's climate resource webpage, newsletter, social media, and direct communication.



**-0.9%**



**JOBS**  
**MONEY SAVED**  
**REDUCED ENERGY BURDEN**  
**ENERGY RESILIENCE**

### Initiative 3: Increase participation in green power purchase programs

**Description:** Green power purchase programs allow electricity users to support increased renewable energy generation by purchasing renewable energy credits (RECs). The RECs allow the purchaser to hold the environmental attributes of the renewable energy, such as the associated GHG reductions. Increase participation such that residents and businesses obtain 5% of consumption through WindSource or Renewable\*Connect.

**Lead:** Community Development / Sustainability Commission

**Timeline:** Fall 2020 — 2023

#### Actions:

1. Continue and build upon engagement strategies established under the Green Wing Energy Action Plan, targeting larger users.
2. Share resources on the city's climate resource webpage.

### Initiative 4: Incorporate elements of solar-ready development and wind energy systems into zoning ordinance

**Description:** The current city code ([Special Provisions 55-118, Solar Energy Systems](#)) designates solar energy systems as a permitted use in all districts. Solar-ready development, however, is not included in the city code. The City should review the code to identify opportunities to update ordinances that would support new construction that is solar-ready.

Utilize best practices from model wind ordinances to develop ordinance language that will allow Red Wing to encourage wind development while considering community concerns.

**Lead:** Community Development / Advisory Planning Commission

**Timeline:** Spring 2021 — 2025

#### Actions:

1. Continue participation in the SolSmart program to receive additional assistance to update city development standards that would enable solar-ready development.
2. Establish a subcommittee to develop a wind ordinance. The subcommittee should develop an engagement process to bring in voices from the community regarding how and where wind energy should be developed in the city.



## Strategy V: Reduce the Waste Stream (divert additional 5% from incinerator)

The City has already taken actions to advance its waste transfer station and waste program, including the transition to single-sort recycling in September 2019. The city should leverage these successes to accommodate organics and pursue a city waste plan that captures longer-term opportunities for reducing greenhouse gas emissions from waste. Divert an additional 5% of waste from the energy facility.



**-0.2%**



**GLOBAL EMISSIONS  
LESS LITTER  
MORE WASTE  
OPTIONS**

### Initiative 1: Create a city waste education and engagement plan

**Description:** Many of the emissions associated with waste occur before consumers purchase goods. In addition to improving post consumption efforts, the city should also provide educational resources and programming to encourage and incentivize residents and businesses to reduce consumption.

**Lead:** Public Works – Solid Waste Division / Sustainability Commission

**Timeline:** Spring 2021 — 2025

#### Actions:

1. Establish a subcommittee that will be tasked with identifying opportunities to reduce waste in Red Wing, considering education and engagement strategies that improve sustainable purchasing practices and increase recycling rates.
2. Engage residents to solicit feedback on potential pricing strategies aimed at reducing waste.

### Initiative 2: Create an organics pick-up and/or drop-off program

**Description:** Currently Red Wing offers curbside options for both waste and recycling, but there are not options available for organics collection. The city is well-positioned to expand its existing waste services to include organics pick-up and/or drop-off options at the Red Wing Waste Campus. Mitigating organic waste through controlled processing and local options prevents organics from either entering landfills where they break down and release methane (one of the most potent greenhouse gases) or being delivered to a resource recovery facility where they are underutilized.

**Lead:** Public Works – Solid Waste Division / Sustainability Commission

**Timeline:** Spring 2021 — 2024

#### Actions:

1. Explore opportunities to manage and implement a source-separated organics collection or drop-off management program.
2. Collaborate with Goodhue County and surrounding communities to scale organics collection for compost and investigate anaerobic digester opportunities.





## City Leadership

The city is an important leader in demonstrating and supporting climate action within the community. The city can help to accelerate local action by providing resources for businesses and residents to take their own action, developing a climate fund to help implement specific initiatives, and continuing to lead by example.

### Initiative 1: Develop a webpage that includes resources for climate action

Add a webpage to the city's website that includes links to external resources as well as tips for taking individual actions. Resources can include incentive programs, educational material, and examples of success in other communities. The webpage should also include periodic updates on the city's progress and success as it implements this work plan.

### Initiative 2: Create a climate fund to support discrete projects

There are a variety of ways that cities can fund climate-related projects. The city budget can be developed using a climate lens to identify how greenhouse gas reducing measures can be incorporated into normal city operations and functions. To support external initiatives, the city may want to consider a climate fee or other means to collect funding. Other options include crowd-sourcing platforms that support specific projects.

### Initiative 3: Create annual emissions reduction targets and implementation plan

Description: Red Wing has already demonstrated city leadership in its efforts to expand renewable energy through solar installations and community solar garden subscriptions. City staff, across departments, should work internally to develop emissions reduction targets and how to achieve them across buildings and facilities, water distribution and treatment, wastewater treatment, as well as its fleet. Success should be shared with residents.