City of Ashland – Sustainability Committee Meeting

Thursday, March 26th, 2026

6:00 pm – 7:00 pm HYBRID MEETING:

Meeting Link: https://meet.goto.com/740241965 | Access Code: 740-241-965 – 2nd Floor Conference Room (601 Main Street W)

Energy Action Plan, 25x25 Plan, Sourcewater Protection Plan linked here: https://sites.google.com/view/ashland-sustainability/themes

Agenda

1) Approval of Agenda
2) Approval of minutes from the December 11th, 2025 meeting
3) Citizen Participation
4) Presentation: Focus on Energy IRA Home Energy Rebates – Brady Steigauf and Megan Link
5) Projects/Discussions
   a) Communications - Discussion
   b) Ashland County Comprehensive Plan Sustainability Chapter Discussion/Action if necessary
   c) Potential Grant/Funding Opportunities – Beth Gehred
   d) Downtown EV Chargers – Discussion/Action if necessary
   e) City Solar Opportunities – Discussion
   f) Committee Opinion on Data Centers - Discussion
6) Staff Updates
7) Future agenda items
8) Adjournment

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It is possible that members of and a possible quorum of members of other governmental bodies of the municipality may be in attendance at the above stated meeting to gather information or speak about a subject, over which they have decision-making responsibility. Any governmental body at the above stated meeting will take no action other than the governmental body specifically referred to above in this notice.

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Present: Charlie Ortman, Beth Gehred, Amy Amman, Meghan Salmon-Tumas, Rachel Myslivy, Steven Wiley (Planning and Development Director)

Absent: None

Agenda

1) Approval of Agenda
   Chair Ortman called the meeting to order at 6:01 pm and a quorum was declared present. Ortman asked for approval of the agenda. Tumas moved to approve the agenda, Amman seconded. Motion carried 5-0.
2) Introduction of new Committee Member Rachel Myslivy
   New Committee Member Myslivy introduced herself and provided some background information to the committee. Ortman and the rest of the committee introduced themselves and welcomed her.
3) Approval of minutes from the November 6th, 2025 meeting
   Ortman asked for approval of the previous meeting minutes. Tumas moved approval and Gehred seconded. Motion carried 5-0
4) Citizen Participation
   None
5) Projects/Discussions
   a) Municipal Code Section/Eco-Municipality Resolution – Discussion and Action
      Ortman asked Wiley if he took the guidelines from the Eco-municipality resolution and put those into the draft ordinance revisions. Wiley explained the changes and that he had done so. Tumas and Gehred were supportive of the revisions. Ortman asked for any additional input. Ortman stated that if anyone has any recommendations for changes to let us know. Ortman asked for a motion and second to send this to COW and Council. Gehred moved, Tumas seconded. Amman supports it. Motion carried 5-0.
   b) Communications – Discussion
      Ortman asked if this was to advertise ourselves better. Tumas remembered that it was to be a standing item on the agenda. It was suggested that she work with Jen Fanucci who is the City event planner and Ms. Fanucci could help get the word out too. Wiley stated that Ms. Fanucci was putting together a City newsletter and would be soliciting updates from department heads among others for publishing every month, quarterly, etc. Tumas believed that we could have a "Sustainability Corner" section which could fall under the Planning Department updates. Ortman asked if we could come up with snippets in a meeting and get them to Wiley. Wiley said this could work or if we

came up with snippets and a committee member could work on a write up. Ortman stated we could have a standing agenda item at the end of the next month's agenda to generate ideas. Amman is supportive of having updates that tie into things that our committee is working on. Maybe we have a recycling awareness month item. Wiley confirmed with the committee that we would have a standing item on future agendas.

c) Ashland County Comprehensive Plan Sustainability Chapter Discussion/Action if necessary

Tumas submitted a draft and asked if we could talk about it. Ashland County is working to update their Comp Plan as required every 10 years. There are 9 required distinct sections. Chair Ortman is involved. He asked how we could bring sustainability into this process. There was an article in the *Ashland Daily Press* about how the County is looking for community input. It is a good time for us to weigh in. Tumas is thinking about the Eco-Municipality guidelines, planetary boundaries, etc. Energy, PFAS, biodiversity, air quality, (she was involved in working groups last year to start thinking about the comprehensive plan). She threw down ideas and also combed through Bayfield County's plan they recently adopted that had some really inspiring ideas. She did not pull out social justice ideas which are not her area of expertise but she did pull out transportation stuff, etc. She is looking for ideas from the Committee on what is important for the county to provide messaging on and how to do it. Ortman suggested maybe inserting sustainability in the plan everywhere that it is as a hodgepodge or maybe you have an individual sustainability element. The County Board wants to vet things rather than produce them because they do not have the time or expertise. Sustainability is not the only thing plans are short on. There are a lot of departments that don't have a representative involved. Ortman suggests Tumas write what she sees fit and we can review it. He does not think Ashland is against being carbon-neutral. He suggests putting it in and letting them take it out. Write it up with everything as a wish list and we will look at it. We have a year before it needs to be published. The County has established a standing committee so we can look closely at things. Ortman and Gehred are supportive. Myslivy would be happy to look at Bayfield County and the justice and social justice elements. Ortman is supportive of examining justice elements. Myslivy asked someone to send the report. Ortman explained that Tumas referenced the elements of the Comp Plan in her statement. Amman mentioned the 2006 Comp Plan goals. She asked if those are from the current document. Tumas answered that the goals are from the 2006 plan but did not change in 2016. Amman is impressed with the way the goals are written. Ortman stated that the Comp Plan Committee would be happy to hear input from anyone. Ortman believes these plans should drive legislation, rather than a group. Gehred will leave Tumas notes. She agrees with other members. She sees some areas that would be good jumping off points for group. She prefers trying to integrate goals into sections rather than a separate chapter. Gehred provided some definitions of micromobility. Myslivy asked if we could share the materials. Wiley stated that he could. The committee discussed the potential of two members meeting to work on this. Wiley advised to be careful due to open records laws but that he could look into this. Tumas would be interested because this could help us for other things we might do. Tumas likes the idea of integrating sustainability in different areas. Ortman recommends getting it to something that is measurable and that identifies what we

want. Gehred asked if the ordinance gives us the authority to carry out items from the plan. Ortman stated that we only advise the decision makers.

d) Potential Grant/Funding Opportunities – Beth Gehred
Gehred has identified four opportunities and provided a handout. Wiley will scan and email it out. It is a richer time for grants. This could give us a budget. Opportunities include the Boreal Waters (used to be Duluth Superior Community Foundation), Kettering Foundation, Head of the Lakes United Way, and Waste Management. Her thinking is the communication around sustainability. We would need to do a working group to get a grant written for Boreal Waters. Ortman mentioned that the County has a grant writer. He asked Wiley if the City has a grant writer. Wiley stated that various staff write grants here. This would be soft money to help vestiges of Northland stay afloat. Ortman suggested that we make a strong connection to sustainability. Gehred suggested we partner with a nonprofit to manage a grant if we do not want the hassle. Ortman supports trying to get a grant for Sustainability education from Waste Management. Tumas asked if a $500-$1,000 grant could be to get a student on the committee. A technical college partnership could be welcomed. Tumas proposed that maybe AADC could be a location that would let things sit there and provide services to organizations trying to grow out of Northland. Wiley brought up the approval process through Council.

e) Downtown EV Chargers – Discussion
Gehred explained this item. She thinks it makes sense to get some use out of perfectly good infrastructure. She has talked with Bill Bailey and there are some ways we can use the chargers. We can own the equipment and lease the use to another agency. Jolma Electric would be a good idea. They could fix the chargers if anything went wrong. Ortman had brought up the Coop which was more mission aligned. We would need to work out in a contract the details of insurance, maintenance, etc. It is a very modest money maker. The City could lease them to the Coop for a dollar and put the maintenance on the Co-op or could make it more lucrative. The City would have to put up the amount of the grant which was about $38,000. Ortman asked if this would be ready to take to COW. Wiley explained that BART might be interested. Ortman thinks that this should be an action item on the next agenda. Tumas stated that the abandonment of EV charging infrastructure happens often. She had a Level II charger installed at her house and paid a monthly fee. Xcel is discontinuing the program so transferring ownership of the charger to her.

6) Staff Updates
Wiley mentioned the Beaser Avenue Apartment complex and strategic plan update.

7) Future agenda items
Ortman suggested finding a way to identify City lots that would be solar. He asked if Wiley could pull together a map of all City lots. What is the total electricity use for the City of Ashland? We should determine the total Ashland needs and total City needs. Then we can meet the City needs. Ortman stated that his mother's lot is the biggest City lot and the pines could be cut down because they are dying of root rust anyway. Energy Positive Ashland starting with Energy Positive City of Ashland is the major goal. The Committee should write an opinion on data centers. Ortman asked if anyone was comfortable coming up with a statement explaining what we would insist on if one came here. Myslivy has researched on how to advise congregations on AI so can look through

things she has. Ortman can also bring information in. Ortman suggests preparing a sample ordinance. Gehred suggests highlighting the work being done and the fact that we have updated our ordinance. We should add the newsletter update and advertise the Extension link. We took on the mission statement of the Eco-Municipality.

8) Adjournment
   Ortman asked for a motion and second to adjourn. Tumas moved and Amman seconded. The meeting adjourned at 7:32 pm.

25 x 25 Plan for Energy Independence

City of Ashland

October 2018

Center for Rural Communities
NORTHLAND COLLEGE

Acknowledgments

The Center for Rural Communities (CRC) at Northland College completed this report on behalf of the City of Ashland. Funding was provided by the Public Service Commission of Wisconsin's State Energy Program – Planning for and Implementing Clean Energy Investments in Wisconsin Communities by way of the City of Ashland. Thank you to all City of Ashland and Xcel Energy employees who assisted the CRC with efforts to collect information for this report. We also acknowledge the work of CRC student research assistants – Laura Loucks, Evan Vollmer and Olivia Anderson – for their help collecting and organizing data used in this report. Their work and contributions were crucial to the completion of this project.

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Executive Summary

The Center for Rural Communities (CRC) at Northland College worked with the City of Ashland to assess its energy usage and update the City's 2009 25 x 25 Plan for Energy Independence. The following report summarizes the energy usage of its buildings (electricity and natural gas) and fuel usage (gasoline and diesel) by the City's vehicle fleet, and provides recommendations for achieving twenty-five percent of the City's total energy usage through renewable sources by 2025.

Key findings

- Since the early 2000s, the City of Ashland has demonstrated an interest and commitment to environmental sustainability and stewardship in a variety of ways: adopting a resolution to become an Eco-Municipality; committing to become a Green Tier Legacy Community, SolSmart Advisor Host Community, and an Energy Independent Community; and adopting a comprehensive plan that clearly embraces the values associated with sustainability.

The City could achieve its goal of acquiring 25 percent of its total energy from renewable sources by installing or purchasing subscriptions to 1,140 kilowatts of solar modules.

Key findings

- Over the last two years, overall electricity and fleet fuel usage remained flat seeing no noticeable increase in consumption. Over the same period, natural gas usage increased slightly continuing an upward trend in consumption since 2011.

- City facilities staff who oversee the maintenance and operation of city-owned buildings are generally well-informed, and actively pursuing basic energy-saving strategies (e.g., replacing lights, upgrading HVAC systems, and installing motion sensors) when they are able and as older products or systems need replacing. Biggest hurdles to the timely replacement of these older systems or products are staff time to implement changes and money required to purchase new products.

- Over the last year, the City of Ashland used 1,831,462 kilowatt hours (kWh) of electricity, 82,180 therms of natural gas (which is equivalent to 2,408,531 kWh), and 44,624 gallons of gasoline and diesel for the City's vehicle fleet (which equals roughly 1,558,875 kWh)[2]. The sum of these three forms of energy is approximately equal to 5,800,000 kWh per year. Without additional conservation measures (e.g., increased building insulation, improved energy efficiency practices and equipment, and occupant education), the City of Ashland would require 1,450,000 kWh of electricity through renewable sources (such as solar) to reach its goal of achieving 25 percent of its overall energy usage from renewables.

- The City could achieve its goal of acquiring 25 percent of its total energy (including electricity, natural gas, gasoline, and diesel) from renewable sources by installing or purchasing subscriptions to 1,140 kilowatts of solar modules. If accomplished solely through subscriptions, such as the Xcel Solar*Community Connect program, it would cost approximately $1.8 million; if through city-owned solar modules, it would cost approximately $2.9 million, (using a bulk-rate installation cost of $2.50/watt). It should be noted that the needs of the City (1.14 MW) exceeds Xcel's current offering through the Solar*Community Connect program (a total of 1.0 MW).

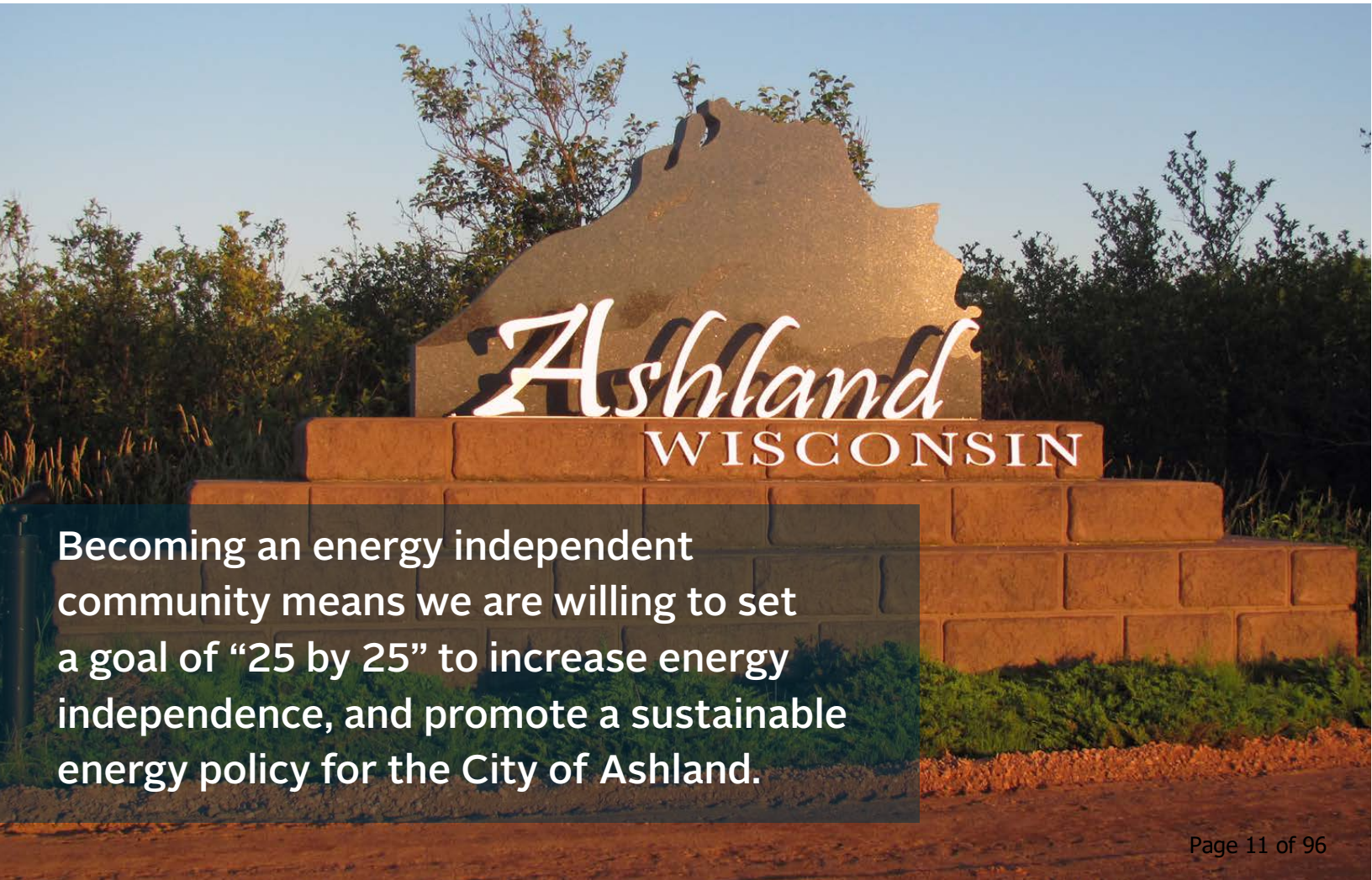
- The City should consider additional energy efficiency improvements of its buildings including additional insulation, better windows, high-efficiency HVAC systems, lower-energy lighting systems, energy efficient office equipment and appliances, and other energy saving measures and policies to help lower its overall energy usage. For example, if the City were to achieve 10 percent reduction in energy consumption through these measures, it would save over $50,000 on an annual basis, and reduce the expense associated with attaining its renewable energy goal by up to $200,000.

[2]We converted therms to kWh by multiplying the number of therms by 29.308. We converted fleet fuel to kWh by estimating the proportion of overall gallons used for gasoline and diesel. Our estimates assume that roughly two-thirds of the total gallons of fuel were from gasoline and the remaining one-third for diesel. We then converted these proportions to kWh through the following formula – 2/3 x 44,624 gal x 29.308kWh/0.877gal = 994,177 kWh; 1/3 x 44,624 gal x 29.308kWh/0.772gal = 564,698 kWh; Total = 1,558,875 kWh.

Introduction

In 2005, the City of Ashland became one of the first communities in the country to pass a resolution to become an Eco-municipality. Later, Ashland became a Green Tier Legacy Community, SolSmart Advisor Host Community, and an Energy Independent Community. The values and principles associated with each label are part of the City's image and demonstrate its commitment to protecting and respecting the natural environment of the Chequamegon Bay region. Most recently, the City's updated comprehensive plan, Authentic Ashland: A Comprehensive Plan for the City of Ashland 2015-2035, clearly embraces the values environmental sustainability and stewardship.

Similarly, these same values show up in this report, which is an energy independence assessment of the City of Ashland's electricity, natural gas, and vehicle fuel usage. In this report, we examine energy usage trends and provide recommendations for how the City of Ashland can move closer to becoming an energy independent community. Specifically, we explore ways the City can obtain twenty-five percent of its energy usage through investing in alternative energy sources (e.g., solar photovoltaic), reducing energy usage and increasing energy efficiency of high consuming building, and upgrading part of its fleet to electric or hybrid vehicles.



Becoming an energy independent community means we are willing to set a goal of "25 by 25" to increase energy independence, and promote a sustainable energy policy for the City of Ashland.

Methodology

This report relies on a variety of sources to assess energy usage and to provide recommendations for becoming an energy independent community. First, we utilize available records for electricity consumption (kWh, dollars) and natural gas (therms, dollars) provided by Xcel Energy for 36 properties from April 2011 to March 2018. For the seven highest consuming properties, we conducted walk through energy audits to supplement energy usage data. We also consulted knowledgeable City and Xcel employees regarding questions of energy usage patterns, buildings, and policies.

Finally, as part of the 2009 energy assessment report completed for the Chequamegon Bay area communities, one of the main suggestions was to improve tracking and monitoring systems for City-owned fleet data. The City of Ashland has been tracking fleet fuel (gallons) and cost (dollars) for thirteen departments and divisions since 2011. We utilize this information for assessment of City fleet data.

Table 1. Department Tracking Fleet Fuel Usage

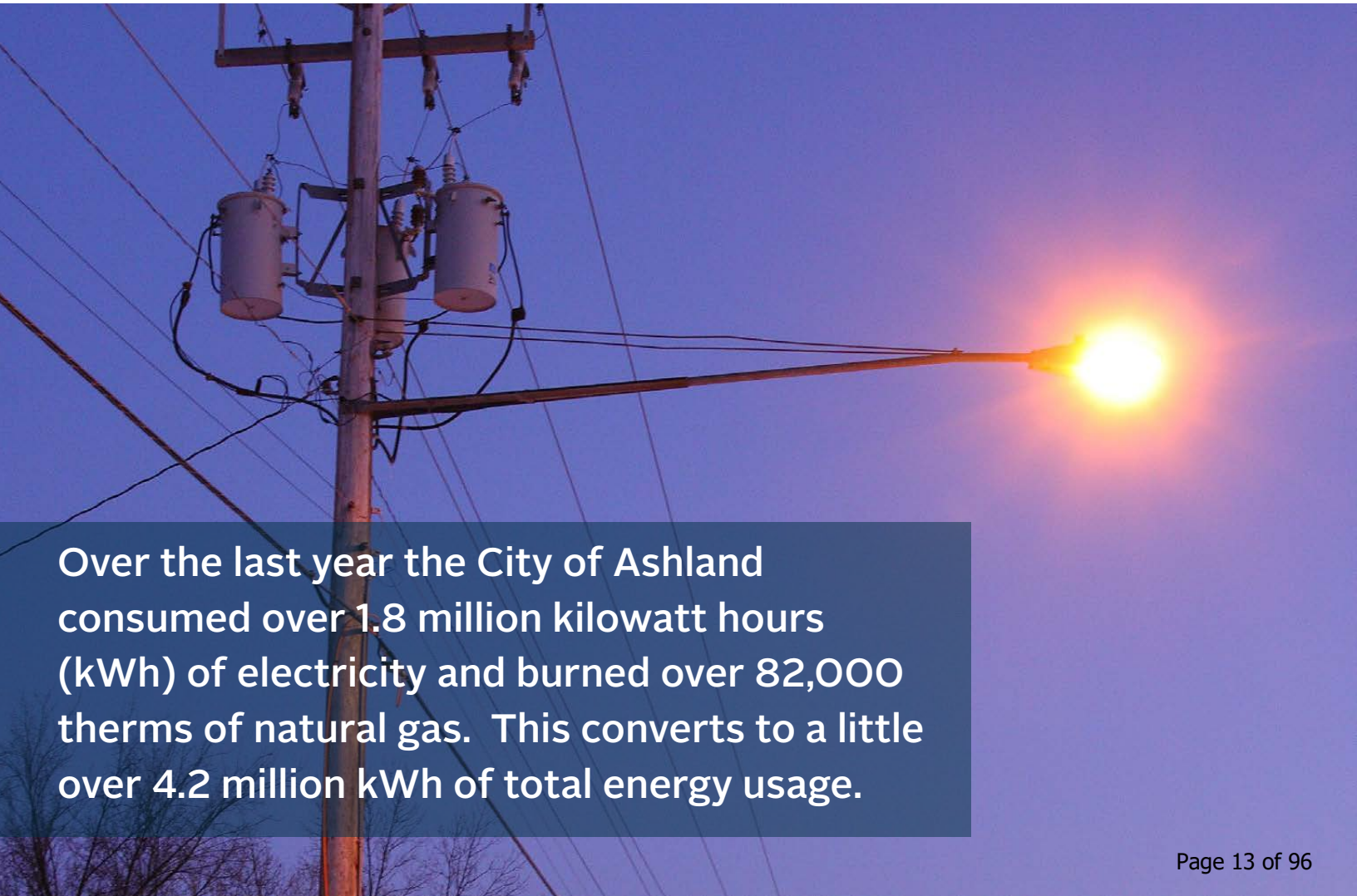
DEPARTMENT OR DIVISION
Ashland Housing Authority
Ashland County Aging Unit
Bay Area Rural Transit
Bay Area Rural Transit
Ashland Ambulance
Ashland Police Department
Department of Public Works
Engineering Division
Parks Department
Animal Warden
Facilities Maintenance
City Hall and Library
Water and Wastewater Utilities

Table 2. City Owned Properties

ID	NAME	ADDRESS
303417099	Sm Gen Svc	211 6th St W
302190096	Airport Maintenance Building	50511 St Hwy 112
302335868	Kreher Park Restroom	310 Prentice Ave N
302347645	Hodgkin's Park South	1222 7th St E
302449200	Prentice Park Camp	515 Turner Rd
302552596	Little League Park	700 14th Ave W
302562103	Sm Gen Svc	423 6th St W
302562242	East End Skate Rink	1612 5th St E
302644433	Hangar	50511 St Hwy 112
302982746	Bandshell	131 Lake Shore Dr W
302984816	Vaughn Library	502 Main St W
302991848	Terminal Building	50511 St Hwy 112
303093843	Penn Park	901 7th Ave E
303105193	Cold Storage Building	2020 6th St E
303112466	Bretting Rec Center	400 4th Ave W
303197007	Maslowski Beach Restroom	3215 Lake Shore Dr W
303307401	Hodgkin's Park Lights	1200 7th St E
303335742	Prentice Park Restrooms	517 Turner Road
303389302	Kreher RV Park	310 Prentice Ave N
303494786	Maslowski Beach Pavilion	3225 Lake Shore Dr W
303518678	Penn Park Restrooms	922 Willis Ave
303580956	Public Works Building	2020 6th St E
303590846	City Hall	601 Main St W
303603030	Bayview Park Restroom	1809 Lake Shore Dr E
303705559	Marina	300 Ellis Ave N
303820841	Hodgkin Park Equipment Rm	1120 7th Street E
303825973	West End Rink	601 Main St W
303963830	Airport	50511 St Hwy 112 Gate
304178140	St Lt Svc	825 Main Street W
304500475	Fire Station	215 6th Street E
304520171	Sm Gen Svc	323 Stuntz Ave N
302154453	Wastewater Utility	1901 Knight Rd
302152769	Wastewater Utility	314 11th Ave E
302152769	Wastewater Utility	523 Lake Shore Dr
303562018	Wastewater Utility	2614 Lake Shore Dr
303648977	Wastewater Utility	524 Turner Rd

Electricity and Natural Gas

In this section, we discuss electricity and natural gas usage trends for all City of Ashland properties. We do so for overall electricity and natural gas usage as well as usage by select properties (i.e., the highest energy consuming buildings). For the highest energy consuming buildings, we supplement the energy usage data with insights from field visits where we conducted an informal energy audit for each of these properties. We include specific recommendations for increasing energy efficiencies and reducing energy consumption for these high energy consuming properties.



Over the last year the City of Ashland consumed over 1.8 million kilowatt hours (kWh) of electricity and burned over 82,000 therms of natural gas. This converts to a little over 4.2 million kWh of total energy usage.

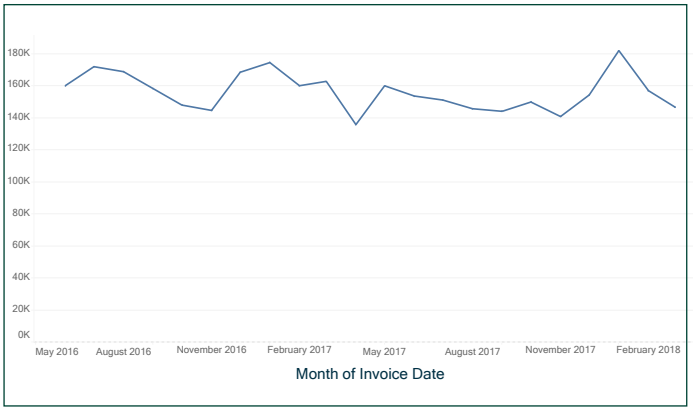
Overview

Over the last year and across all City owned properties, the City of Ashland consumed over 1.8 million kilowatt hours (kWh) of electricity. Similarly, the City burned over 82,000 therms of natural gas. When converted into kWh, we estimate that the total energy used by City properties and buildings from April 2017 to March 2018 is a little over 4.2 million kWh of energy. The total cost to the City over this period of time was approximately $234,960 (or about $20,000 per month).

Table 3. Electricity and Natural Usage, April 2017-March 2018

KILOWATT HOURS	ELECTRICITY INVOICE ($)	THERMS	GAS INVOICE ($)	TOTAL ($)
1,831,462	180,236	82,180	54,724	234,960

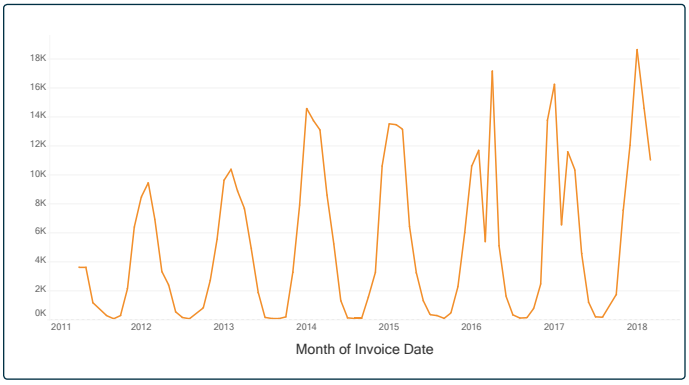
Figure 1. Total Electricity Usage (kWh) by Month, June 2016-March 2018[3]



Between June 2016-March 2018, electricity usage within the City remained flat with no evidence of an upward or downward trend.

The City of Ashland saw an increase in natural gas usage from its 2011 baseline. Although the overall use of natural gas for City owned properties as a whole remained flat between 2014 and 2017 (figure 2).

Figure 2. Total Natural Gas Usage (Therms) by Month, January 2011-March 2018



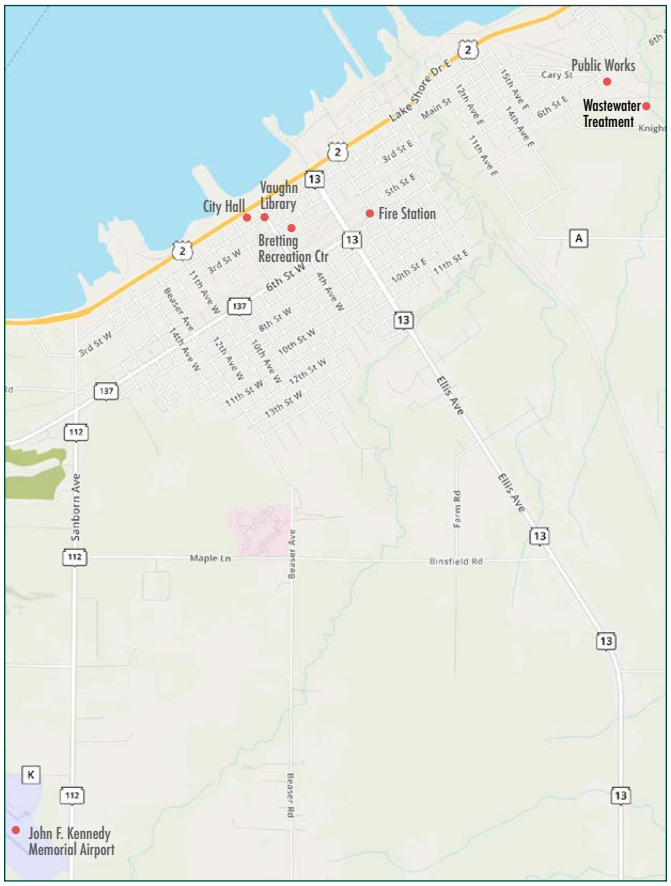
[3]We show trends for overall usage from June 2016 to March 2018 due to having complete data for all properties back to this date. We were not able to get data for the wastewater treatment plant farther back than this date. We have data for all other properties dating back to January 2011.

Top Consuming Buildings

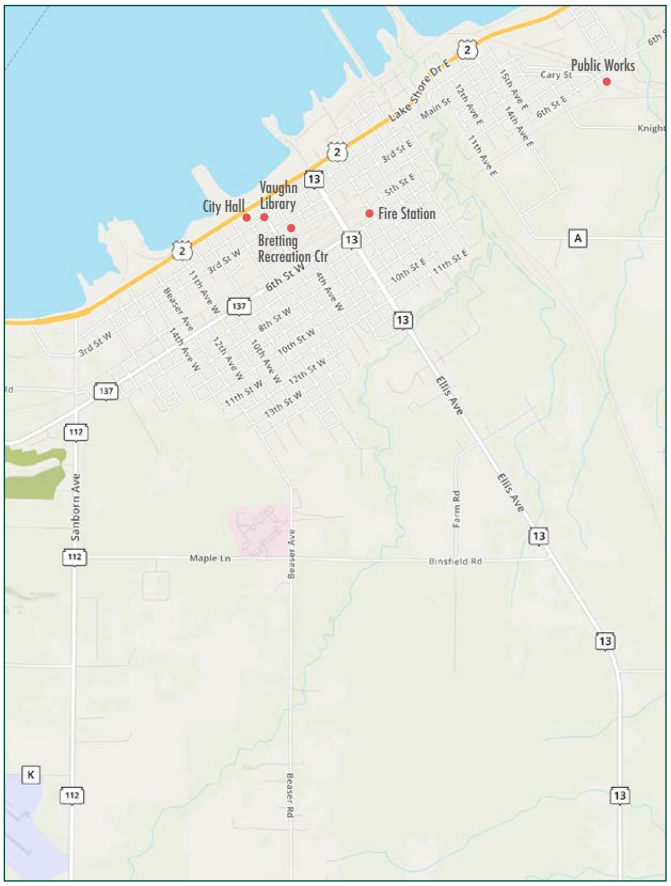
The top electricity consuming properties are wastewater treatment facilities (including several lift stations at various locations around Ashland), the fire station, city hall, the public works building, Bretting Recreation Center, airport facilities, and Vaughn Public Library (map 1).

The same buildings, with the exception of the wastewater treatment buildings and JFK Memorial Airport are the top natural gas consuming properties (map 2).

Map 1. Top Electricity Consuming Buildings



Map 2. Top Natural Gas Consuming Buildings



We estimate that the top seven electricity consuming locations and the top five natural gas consuming locations account for nearly all of the City's usage – approximately 99.5 percent of the electricity (kWh) and 98.1 percent of the natural gas (therms). In figure 3, we add electricity (kWh) and natural gas (therms converted into kWh) to identify the seven highest consuming buildings. To better understand energy consumption patterns and provide more specific recommendations, the CRC conducted informal energy audits of all of these buildings with qualified individuals who were able to describe the projects already implemented and some of the reasons for the high energy usage. From these tours, we observed that the facility staff who oversee the maintenance and operation of the City's buildings appear to be aware and well-informed of basic energy-saving strategies, with the following already in progress:

1. Replacing incandescent and fluorescent bulbs with more efficient and longer lasting LED bulbs. These are generally done as time and funding allows, particularly when existing bulbs burn out.

2. Upgrading old HVAC systems with more efficient variable air volume (VAV) systems. In some instances, however, problems exist between where the conditioned air is delivered and the location of the thermostat. To optimize comfort and energy efficiency, separate controls and additional ductwork may be required.

3. Replacing fixed-on lights (e.g. in restrooms) with motion sensors that automatically turn off lights when the room is unoccupied.

4. Covering single-pane windows with storm windows or interior plastic to reduce air infiltration and uncomfortable drafts.

Figure 3. Total Energy (kWh and Therms) by Top Consuming, April 2017-March 2018

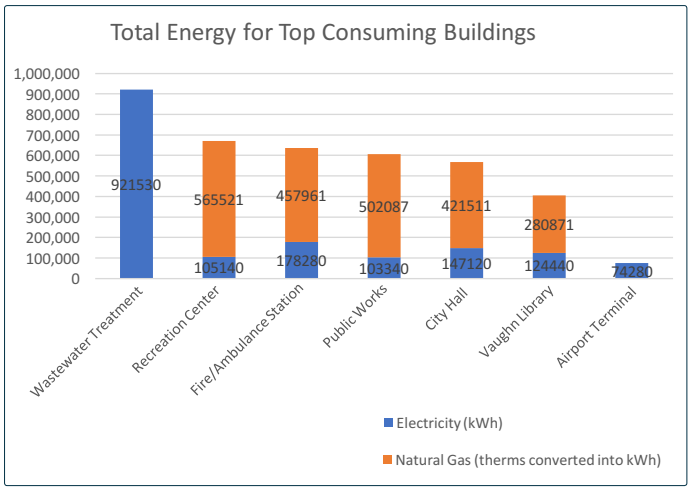
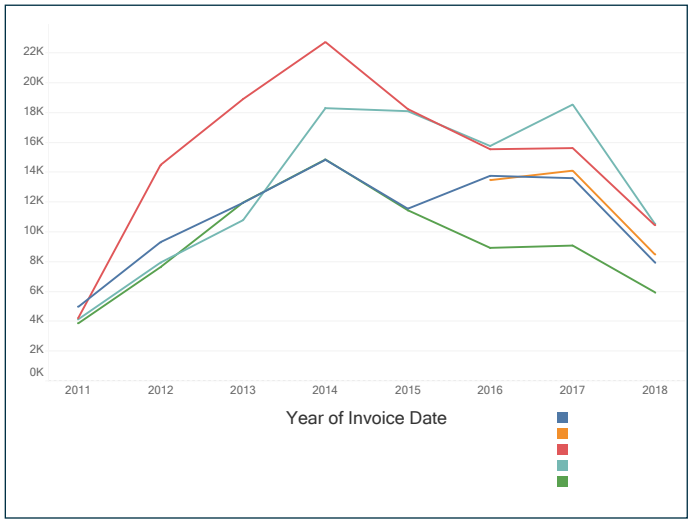


Figure 4. Natural Gas Usage (therms) by Top Consuming Buildings, January 2011-March 2018



Wastewater Treatment Plant
1901 Knight Road

The highest consumer of electricity for the City of Ashland is the wastewater treatment facility. Accounting for nearly 50 to 60 percent of the City's overall electricity consumption, the treatment plant operates pumps, aeration units, and an ultra-violet sterilization system that runs 24/7, day and night. The City has already invested in significant energy efficiency measures, including:

1. The majority of the pumps have been upgraded with variable frequency drives (VFD) to minimize their energy usage. The facility uses a variety of pumps of differing capacities to allow for efficient control under varying demands.

2. The facility employs a Supervisory Control and Data Acquisition (SCADA) software system that networks computers and graphical interfaces to improve the efficiency of monitoring and operational control.

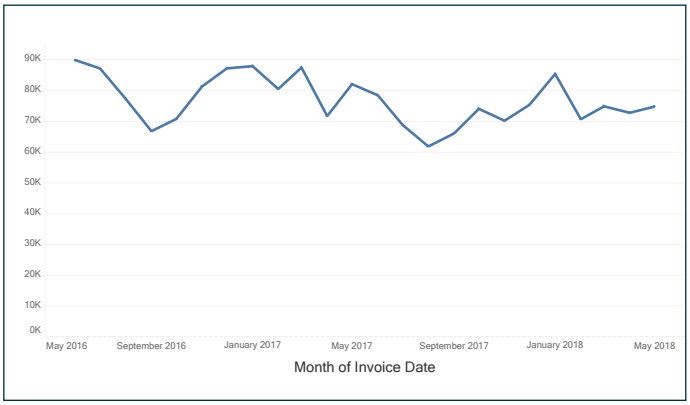
3. The aeration units for the oxidation tanks have been upgraded from large bubble jets to smaller, more energy-efficient fine-bubble diffusers.

4. Submerged ultraviolet (UV) bulbs sterilize the outflow without the use of chemical additives.

5. Upgrades to the HVAC system are in progress.

6. Some fluorescent have been converted to LED.

Figure 5. Waste Water Treatment Plant Electricity Usage (kWh) by Month, June 2016-May 2018



Recommendations

The wastewater treatment facility could further advance its energy efficiency by investing in these improvements:

1. Reduce the amount of water entering the plant by promoting water conservation from residential and commercial customers.

2. Separate the City's storm water system from its septic system so that storm water does not arrive at the treatment facility. The facility director indicated that at present they do not have the staff or resources to investigate where storm water is entering the sewer system.

3. Better educate City residents against flushing problem items (e.g. "disposable wipes") into the sewer system. These items can clog pumps and require time-consuming labor to remove.

4. The water treatment plant backflushes its filtration system on a daily basis to remove silt carried in from Chequamegon Bay. Currently, this backflushing fluid, which remains uncontaminated, is sent to the wastewater treatment plant, where it mixes with sewage. We recommend assessing whether this backflushing fluid can be safely returned directly to Chequamegon Bay, thereby reducing demands on the wastewater treatment facility.

5. Conduct a feasibility study for the implementation of anaerobic digestion to create combined heat and power (CHP) for the facility. The digested sludge could also be sold as compost or animal bedding to provide revenue for the City.

Fire Station
215 6th Street East

The fire and ambulance station is the newest building owned by the City of Ashland. Built in 2015 with modern energy efficient systems, the building accounts for less than ten percent of the City's annual electricity usage and just under twenty percent of its annual natural gas usage.

The fire station employs in-floor hydronic heat loops for the entire footprint of the vehicle bays and along the perimeter of the administration building. High efficiency natural gas boilers and energy efficient pumps circulate the heated fluid.

For the vehicle bays (including equipment storage), heat is supplied only by the in-floor system, which works well in winter to melt snow and keep the floor dry. The HVAC system serving the administration building does not extend to the vehicle bays, which have no cooling system for summer months. A separate ventilation system circulates fresh air through the vehicle bays and heats the air (using hot water from the boiler) if the outside temperature is below 45°F. The intake for this ventilation air is on the roof of the administration building, which consists of black rubber membrane (EPDM) and can get quite hot in the summer. Hence, during the summer months the fresh air for the vehicle bays can become uncomfortably warm. The vehicle bays are equipped with an exhaust system that attaches flexible ducts to the tailpipes of vehicles. Automatic fans draw the exhaust fumes outside. However, the system does not include make up air, resulting in negative pressure within the vehicle bays when this system is in use. Furthermore, the bays are not equipped with heat exchangers to extract energy from either the stale air of the bays themselves or from the vehicle exhaust ducts.

The HVAC system serving the administration building includes electric heating elements within the ductwork to supplement the primary system supplied by natural gas. These electric heating elements allow individuals to adjust the temperature of particular offices separate from the

Figure 6. Fire Station Electricity Usage (kWh) by Month, October 2015-March 2018

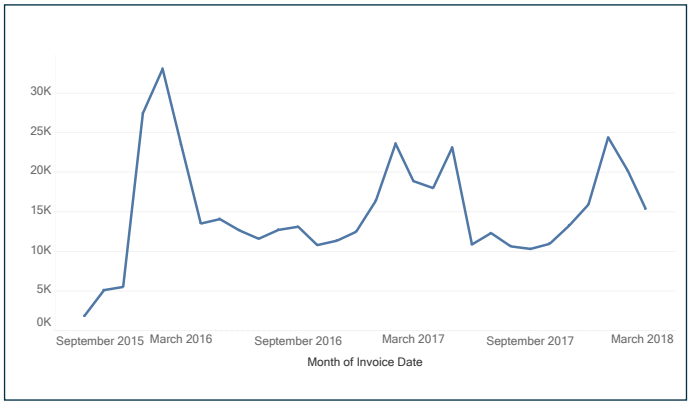
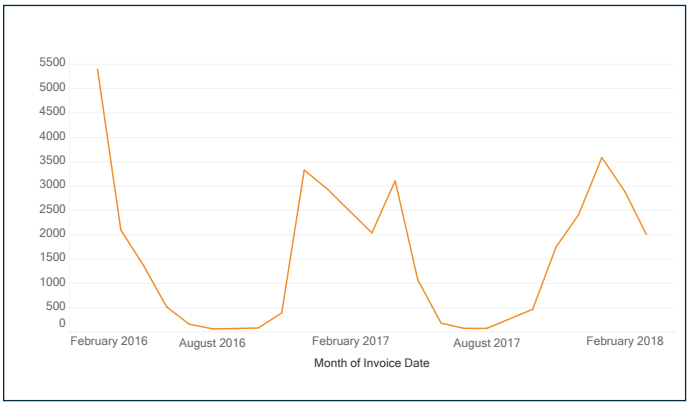


Figure 7. Fire Station Natural Gas Usage (therms) by Month, March 2016-March 2018



set point of the main system, thereby minimizing frequent adjustments and improving efficiency. The HVAC system utilizes seven variable air volume (VAV) thermostats in different areas of the building, another feature that improves overall efficiency.

(continued on next page)

Recommendations

1. Consider installing a heat exchanger to extract and save energy from the vehicle bays.

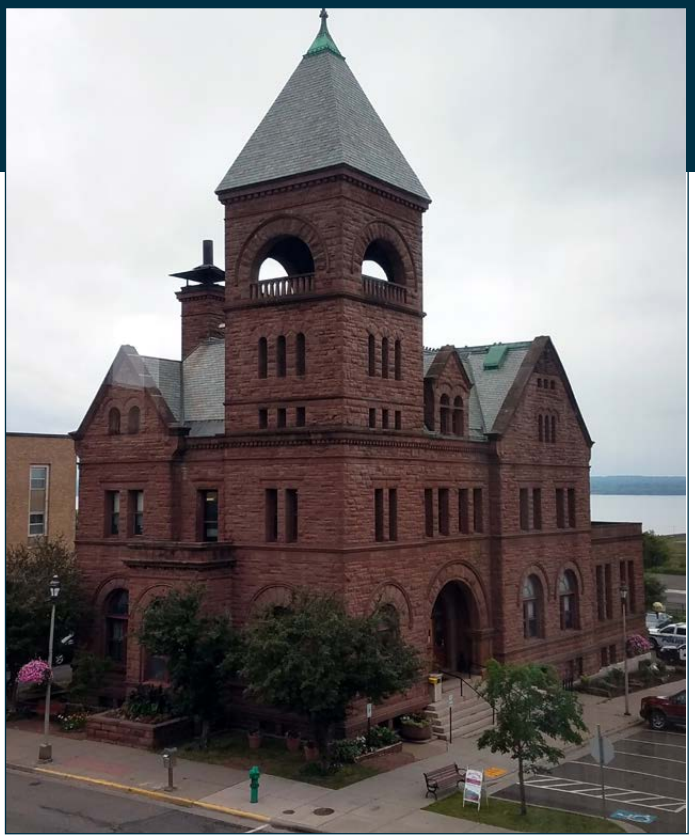
2. Assess the possibility of including make-up air for the vehicle exhaust system to prevent negative pressure. This system should also include heat exchanging properties (or be incorporated into a larger system).

3. Paint the EPDM roof of the administrative building white to reduce summer heating of the vehicle bay ventilation air. Alternatively, assess the possibility of creating a living roof to assist with cooling.

4. Insulate the aluminum frames of the windows in the administrative building, which currently get quite cold in the winter.

5. Convert existing fluorescent bulbs with LED bulbs as opportunities arise.

City Hall
601 Main Street West



City hall is a historic building constructed of brownstone blocks, which offer poor insulation. We estimate that city hall consumes about seven percent of the City's total electricity and nearly 20 percent of its natural gas. Since natural gas boilers are used to circulate heated water through wall-mounted radiators, the large seasonal use of natural gas suggests that the building suffers from inadequate insulation. Furthermore, the high ceilings and the absence of any form of destratification results in excessive heating to maintain comfort.

The City has already invested in some energy efficiency measures by:

1. Replacing single pane windows with triple-pane windows in the council chamber and covering the windows with cellular (honeycomb) shades.

2. Replacing some of the old lights with LEDs.

Recommendations

1. Assess the feasibility of insulating exterior walls. This may require significant interior renovation.

2. Replace single-pane windows with insulating windows, prioritizing as resources permit.

3. Consider more efficient (perhaps centralized) air conditioning systems.

4. Investigate large sources of electricity use. Monthly electricity usage has a baseline of nearly 10,000 kWh, plus higher seasonal variations. Consider hiring a company to install real-time energy monitoring devices to track down usage.

5. Add insulation to the roof. The roof appears to be insulated with R-19 fiberglass batts with no vapor barrier. Buildings in this climate benefit from two to three times as much insulation. However, the high levels of air-infiltration from leaky windows may limit the effectiveness of adding ceiling insulation without first correcting the worst of the windows.

Figure 8. City Hall Electricity Usage (kWh) by Month, April 2011-March 2018

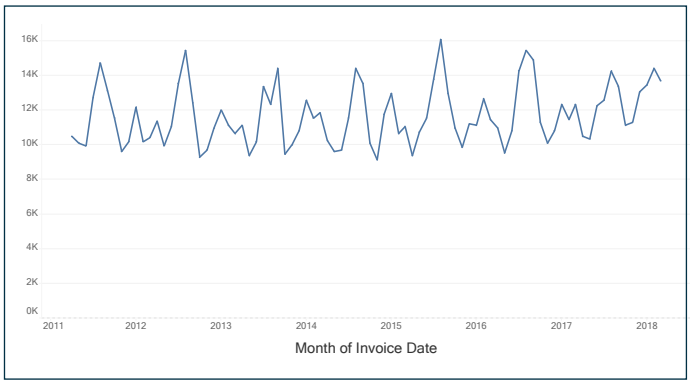
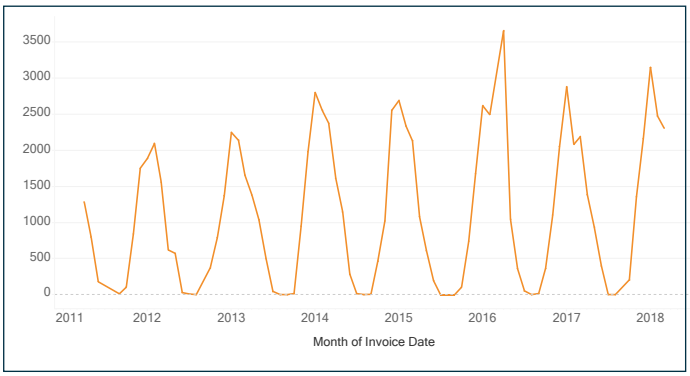


Figure 9. City Hall Natural Gas Usage (therms) by Month, April 2011-March 2018



Vaughn Public Library
502 Main Street West

The Vaughn Public Library is a 138-year old building occupying 20,400 square feet and accounts for 7 percent of the City's overall electricity usage, and 12.9 percent of its natural gas consumption.

The building was remodeled in 1983, moving the entrance from Main Street to Vaughn Avenue. The main library utilizes the first floor and basement, while the second floor provides meeting rooms, computers, and a children's room. The third floor is rented office space. Recent improvements include two new boilers, some LED lighting on the third floor, and the replacement of several windows. The basement and first two stories are heated by two high-efficiency natural gas boilers using wall-mounted radiators. The first floor (but not second floor) benefit from central air conditioning. The third floor offices have their own HVAC system.

Figure 10. Vaughn Library Electricity Usage (kWh) by Month, April 2011-March 2018

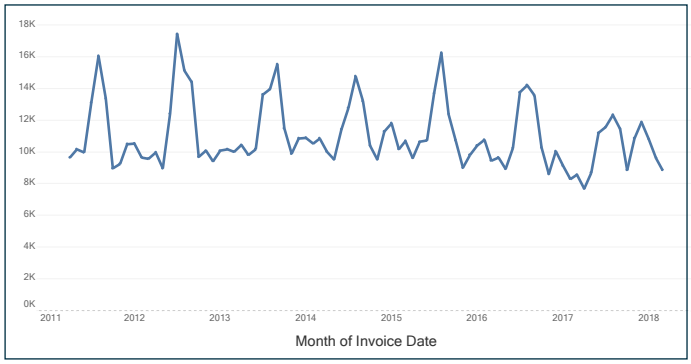
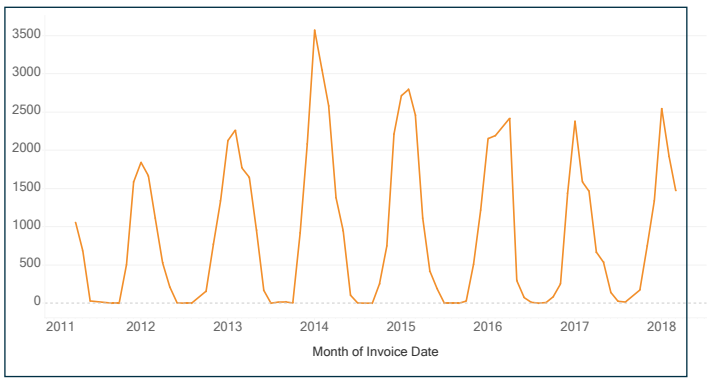


Figure 11. Vaughn Library Natural Gas Usage (therms) by Month, April 2011-March 2018



Long-term occupants of the library indicate that the building is rarely comfortable. Poor insulation (some of which results from the brownstone construction), air infiltration (including leaking windows), inadequate HVAC systems, and the relative isolation of the second floor—all contribute to high energy consumption and compromised comfort.

Energy efficiency measures in progress:

1. A new high-efficiency natural gas boiler was installed three years ago.
2. Central air conditioning for the first floor eliminates the use of less efficient alternatives.
3. Some of the third-floor fixtures have been switched to LED lighting.
4. Main entrance opens into a foyer, rather than directly into the library, reducing heat loss.

Recommendations

1. Consider replacing existing lighting fixtures with LED alternatives where appropriate.
2. Upgrade the HVAC system to provide air conditioning for the second floor, eliminating the need for less-efficient window-mounted units.
3. Replace windows where most needed, such as on the second floor.
4. During interior renovations, add insulation to walls and ceiling and improve windows.
5. Ensure that unnecessary electronics are shut down when not in use (e.g. when closed), including second floor computer room.
6. Ceiling fans to reduce air conditioning needs.

Bretting Recreation Center
400 4th Avenue West

The Bretting Recreation and Community Center is a large building (17,600 square feet) that houses the Parks and Recreation Department, and includes a large open gym with basketball and volleyball courts, a gymnastics room, and a youth recreation area. We estimate that the recreation center consumes about five percent of the City's overall electricity usage but over 23 percent of its natural gas usage--the largest proportion of any City property. This may indicate insufficient insulation, inefficient heat exchangers, excessive heating due to poor circulation, or a combination of issues. The gym, a large multipurpose space, utilizes its own heating and ventilation system that does not include air conditioning. As a result, the gym can become hot and humid in the summer, limiting its seasonal usefulness. The gymnastic room, recreation area, and offices include a full HVAC system. However, the ductwork delivering conditioned air appears to be inappropriately sized for the various spaces. Office workers report that they regularly have to turn on electric space heaters during the summer to keep from being overly cooled by the AC system, a highly inefficient situation. One problem may be that the thermostat controlling the system is located in the recreation area, a room that undergoes larger temperature fluctuations than the more centralized offices due to many large windows unprotected from summer sunshine.

Figure 12. Bretting Recreation Center Electricity Usage (kWh) by Month, April 2011-March 2018

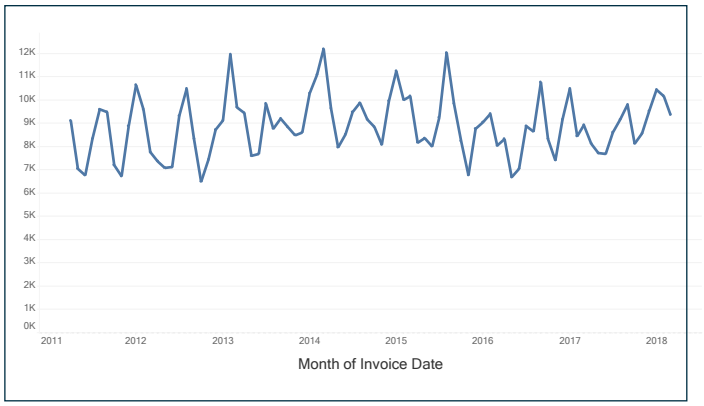
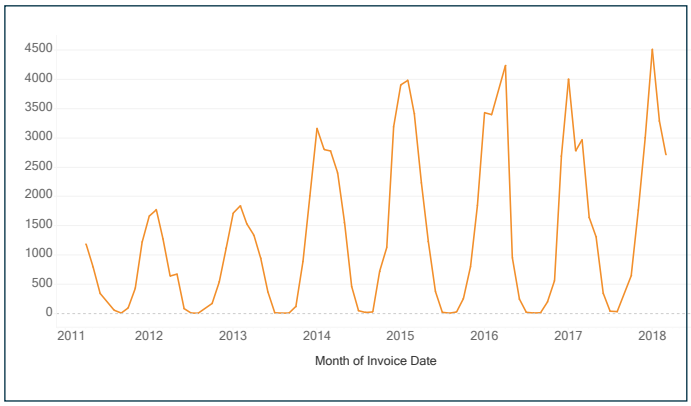


Figure 13. Bretting Recreation Center Natural Gas Usage (therms) by Month, April 2011-March 2018



Energy efficiency measures in progress:

1. Some older light fixtures have been replaced with LED bulbs.

2. LED fixtures have been purchased for the gym, though they have not yet been installed. Since the gym lights are kept on all day during the "open gym" period, replacing these lights should offer significant savings in electricity costs.

(continued on next page)

Recommendations

1. Consider installing dampers on the conditioned air ducts into the office so that office workers can better regulate temperature. Adjust the HVAC system so that space heaters are not used.

2. Evaluate heat loss throughout the center. Consider using thermal imaging to find areas of insufficient insulation (which may include the entire roof/wall system). Insulate as necessary.

3. Assess the operation and efficiency of the existing heat exchangers on the HVAC systems.

4. Consider the feasibility of installing high windows or roof-mounted daylighting to allow indirect natural light into the gym and gymnastics room. This could significantly reduce the need for artificial lighting during daylight.

5. Consider installing large ceiling fans in the gym and gymnastics room. These could provide low-energy cooling for the summer and reduced heating requirements in the winter by destratifying warm air near the ceiling.

Public Works
2020 6th Street East

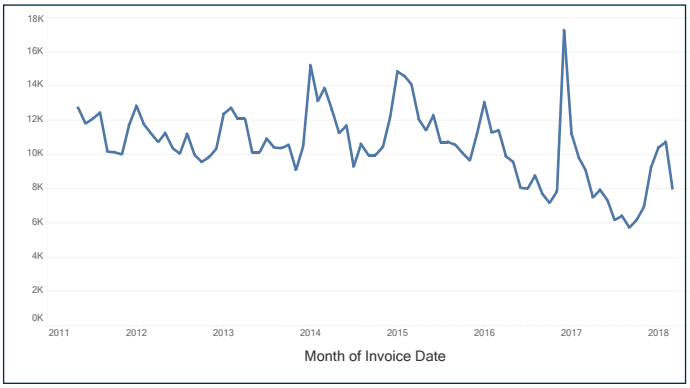
The public works building occupies 40,172 square feet and accounts for about five percent of the overall electricity consumption and 21 percent of the natural gas consumption of City owned properties. Over the last two years for which data is available (2016 and 2017), the Public Works building has seen roughly a 34 percent decrease[4] in electricity usage from its historical high in 2015.

At the heart of the public works building are the large garages, workshops, and vehicle washrooms. Not surprisingly, the garage doors are neither well insulated nor well sealed against drafts. As a result, overhead natural gas radiant heaters are frequently running during the winter months. Doors into administrative spaces open directly onto work spaces and garages, allowing unimpeded transfer of air (and possibly contaminants). Single-paned windows, set in concrete walls, provide inadequate insulation. Some of the larger administrative windows are covered with Plexiglas to improve comfort levels.

Energy efficiency measures already in progress:

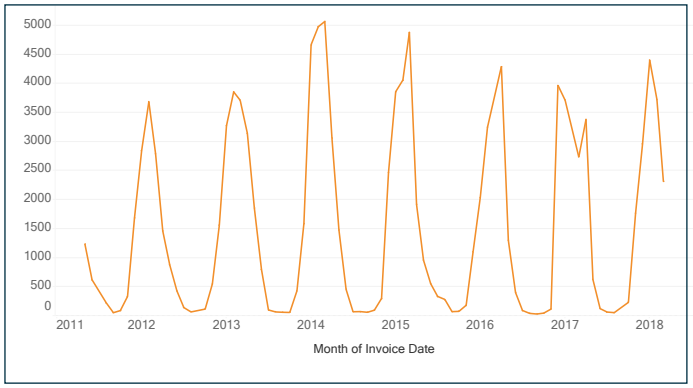
1. Some of the lights have been replaced with LED bulbs, and some are on motion sensors.

Figure 14. Public Works Electricity Usage (kWh) by Month, April 2011-March 2018



[4]The decrease is measured by 2017 meter read date of 93,400 kWh versus the invoice date of 84,160 kWh reflected in public works electricity usage figure.

Figure 15. Public Works Natural Gas Usage (therms) by Month, May 2011-March 2018



2. Office equipment that is not essential tends to be turned off during the night.

3. The old HVAC system is slated to be replaced.

4. The thermostat controller has been updated.

5. Garage doors are left open as briefly as necessary during the winter months.

Recommendations

1. Continue to reduce lighting costs through replacement of older bulbs with LEDs, particularly in the garages that require extensive lighting.

2. Insulate or replace single-paned windows.

3. Consider upgrading HVAC controls to allow temperature adjustability between office spaces. Some employees report that the air conditioner makes the spaces too cold during the summer.

4. Assess feasibility of improving insulation in the roof and exterior walls.

5. Replace doors separating garages and administrative spaces with better sealing models.

JFK Memorial Airport
50511 State Highway 112

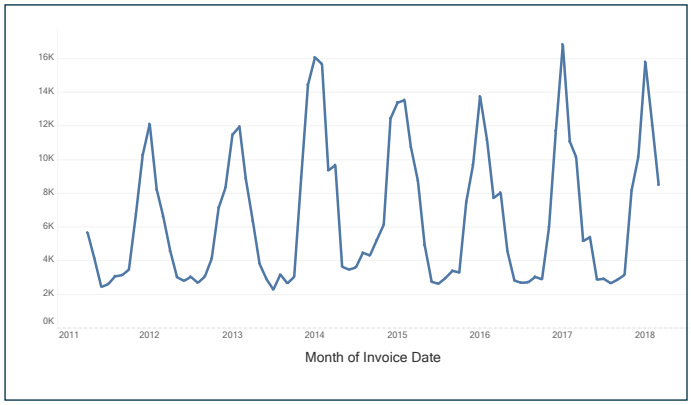
The airport is one of the most energy intensive locations because of the hundreds of incandescent runway lights, which are required by aviation law to be operational from sunset to sunrise. Each of the 104 bulbs currently use 30 watts.

The replacement of incandescent light bulbs with LED bulbs could be economically installed when the runway is redone (proposed to take place in 2020). However, the airport director pointed out that FAA regulations currently require that if incandescent bulbs are replaced with LED bulbs then each LED bulb, which generates too little heat to adequately melt off snow and ice, must be equipped with a supplemental 40-watt heater. Although LED bulbs with 40-watt heaters might still save electricity over the current 30-watt incandescent bulbs—because the heaters would only need to be used during freezing conditions—the FAA requirement significantly limits the economics of their installation. The taxi lights are already LED and are off until the pilot turns them on prior to landing. The terminal building itself, an aesthetic design, is made out of logs without supplemental insulation. The building is heated using an inefficient electric in-floor system. Due to the poor insulation of the building, the floor frequently becomes uncomfortably warm before the building itself warms to a comfortable temperature.

Energy efficiency measures in progress:

1. The taxi lights already use 5-watt LED bulbs rather than incandescent bulbs.
2. Storm windows have been added to the existing single-pane windows to reduce drafts and improve insulation.
3. Light sensors automatically turn off lights to the beacon and wind cone during daylight hours.
4. Equipment storage hanger is reportedly kept at a cool 40-45°F during the winter except when work is being done (at which point the temperature is increased to 60 °F).

Figure 16. JFK Airport[5] Electricity Usage (kWh) by Month, April 2011 – March 2018



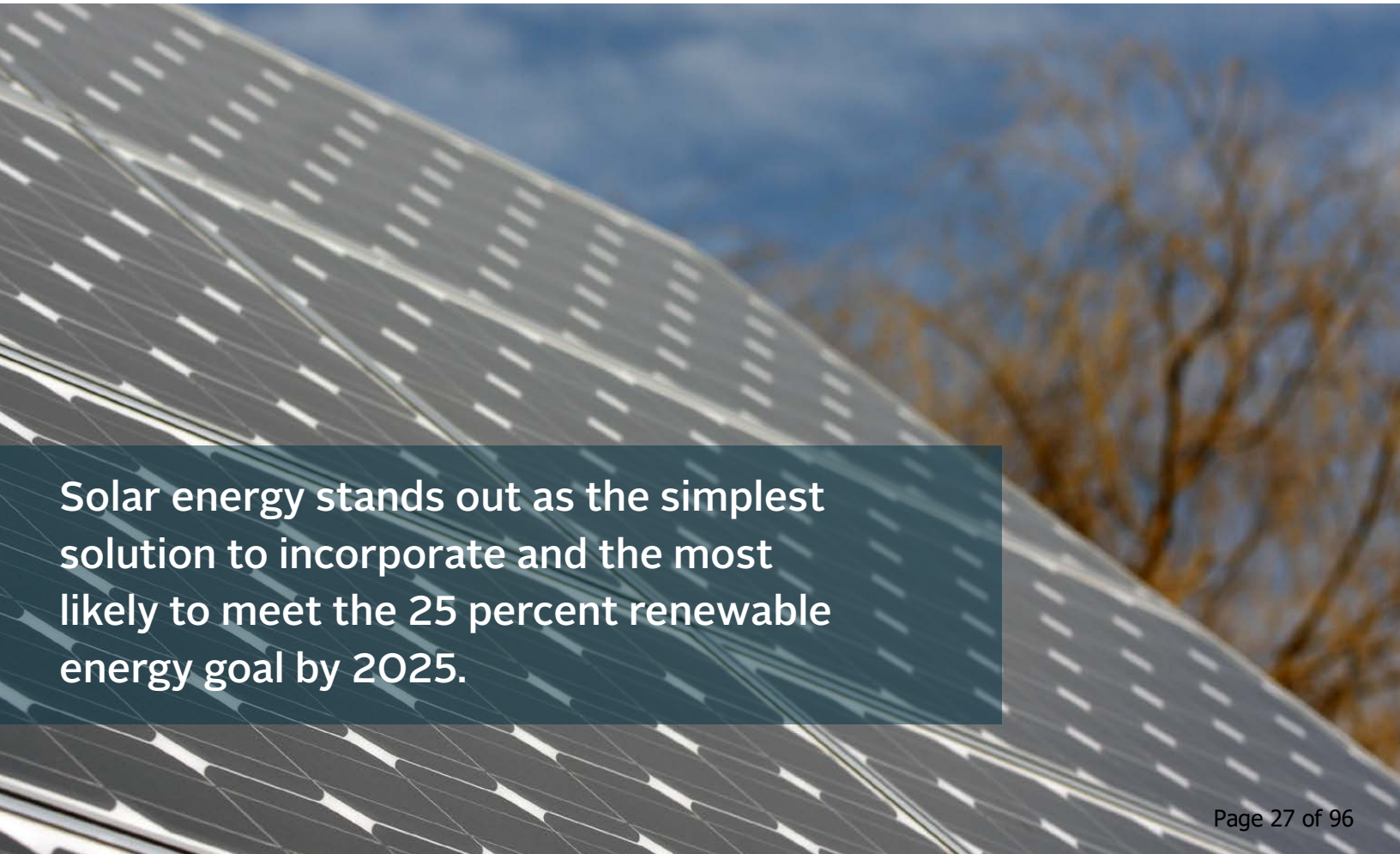
Recommendations

1. Investigate the possibility of installing LED bulbs for the airport runway lights. Research snow/ice sensors to reduce the need to operate the FAA-required 40-watt heating coils during clear conditions. Consider alternate solutions to keeping runway lights clear without energy-intensive heating.
2. Consider improvements to the electric in-floor system, possibly supplementing with a natural gas system to improve occupant comfort and reduce demands on the in-floor system.
3. Consider upgrades to the old and inefficient boiler in the equipment storage hanger.
4. Look into aesthetic methods of better insulating the log cabin construction.

[5]Airport includes Airport (303963830), Airport Maintenance Building (302190096), Hangar (302644433), and the Terminal Building (302991848).

Renewable Energy Options

The three most promising options for harnessing renewable energy in the Chequamegon Bay region are: solar, wind, and biomass. Of these, solar energy stands out as the simplest solution to incorporate and the most likely to meet the 25 percent renewable energy goal by 2025. Numerous studies of wind potential (e.g. see reports from the Northern Great Lakes Visitor Center, Bad River Reservation, and Madeline Island) indicate that this region lacks a consistent, adequate-strength, turbulence-free wind resource to make large-scale wind power economical. The final option, biomass—either from the anaerobic digestion of sewage or the combustion or gasification of wood chips—promises abundant resources but also entails greater start-up costs, more expensive maintenance and operation requirements, and may be difficult to complete by the hopeful 2025 date. For these reasons, this report focuses on solar photovoltaic energy, describing two available options. These two options are: (1) subscribing to Xcel Solar*Connect Community and (2) installing City-owned solar modules.



Solar energy stands out as the simplest solution to incorporate and the most likely to meet the 25 percent renewable energy goal by 2025.

OPTION 1: Xcel Solar*Connect Community Program

Xcel Energy announced at the beginning of May 2018 that they received enough subscriber interest to move forward with plans to construct a one-megawatt community solar garden in Ashland. This solar garden would include a field of solar arrays located on land Xcel owns on Highway 13 south of town. Residents and businesses of Ashland have the opportunity to buy portions of this garden in 200-watt shares and will receive credit on their energy bills each month proportional to their number of shares. This is not a direct purchase of solar modules – a company contracted by Xcel Energy owns, operates, and maintains the array. The purchase is valid for 25 years, after which customers must buy a new subscription. Because the modules are not bought outright, subscribers bear no responsibility for the operation or maintenance of the array. In other words, after the initial purchase, the only impact on customers would be a monthly reduction on their energy bills for 25 years. As soon as Xcel receives full payment, subscribers begin receiving credits. If electricity costs remain constant in the years to come, the simple pay-back time for the investment is estimated to be 15.2 years. However, assuming a more realistic 2 percent escalation in electricity costs, the payback time would decrease to less than 12 years, after which the customer increasingly benefits from the investment. Participation in this program would demonstrate the City's commitment to sustainability and move it forward toward its goal of procuring 25 percent of its electricity from renewable sources as required by the City's 25x25 energy plan.

Table 4. Xcel Solar*Connect Community Program Estimates (4/17-3/18)[6]

Cost ($)	kWh	% Offset	Subscription Size (kWh)	Deposit ($)	Balance ($)	Total ($)	Annual Credit ($)	Credit / 25 Yrs	Credit/25 (yrs) 2 % escalation	Payback (yrs)	Payback (yrs) 2 % escalation
233,066	2,151,141	25	384	32,888	580,932	613,820	40,282	1,007,048	1,290,230	15.2	11.9
		15	230	19,733	348,559	368,292	24,169	604,229	774,138	15.2	11.9
		5	76.8	6,578	116,186	122,764	8,056	201,410	258,046	15.2	11.9
		200 kW	200	40,000	280,000	320,000	21,000	525,000	672,630	15.2	11.9
		400 kW	400	80,000	560,000	640,000	42,000	1,050,000	1,345,260	15.2	11.9

[6] See appendix for cost breakdown per property and overall. Note, although the upper limit per customer is 400 kW, there is currently (as of June 21) only 200 kW available for subscription. That means the City Of Ashland would only be able to purchase around 13 percent of total electricity usage.

Table 5. Xcel Solar*Connect Community Program Estimates per Property (2/16-3/18)

Name Address	Avg $/yr	Avg kWh/yr	% Offset	Subscription Size (kWh)	Deposit ($)	Balance ($)	Total ($)	Annual Credit ($)	Credit/ 25 Yrs	Credit/25 (yrs) 2 % escalation
Wastewater Utility 1901 Knight Rd	77,279	91 21,530	100	658.2	131,647	921,530	1,053,177	63,586	1,589,639	2,036,646
			75	493.7	987,35	691,148	789,883	47,690	1,192,229	1,527,484
			50	329.1	658,24	460,765	526,589	31,793	794,820	1,018,323
			25	164.6	329,12	230,383	263,294	15,896	397,410	509,162
Wastewater Utility 314 11th Ave E	47,207	261,058	100	186.5	37,294	261,058	298,351	18,013	450,324.	576,955
			75	139.9	27,970	195,793.	223,764	13,510	337,743	432,717
			50	93.2	18,647	130,529	149,176	9,006	225,162	288,478
			25	46.6	9,323	65,264	74,588	4,503	112,581	144,239
Fire Station 215 6th St E	17,150	178,280	100	127.3	25,469	178280	203,749	13,193	329,818	422,563
			75	95.5	19,1019	133710	152,811	9,895	247,364	316,922
			50	63.7	12,7349	89,140	101,874	6,596	164,909	211,281
			25	31.8	6,3679	44570	50,937	3,298	82,455	105,641
City Hall 601 Main St W	14,909	147,120	100	105.1	21,017	147,120	16,8137	10,887	272,172	348,707
			75	78.8	15,763	110,340	12,6103	8,165	204,129	261,530
			50	52.5	10,509	73,560	8,4069	5,443	136,086	174,353
			25	26.3	5,254	36,780	4,2034	2,722	68,043	87,177
Vaughn Library 502 Main St W	14,014	124,440	100	88.9	17,777	124,440	142,217	9,209	230,214	294,950
			75	66.7	13,333	93,330	106,663	6,906	172,661	221,213
			50	44.4	8,889	62,220	71,109	4,604	115,107	147,475
			25	22.2	4,444	31,110	35,554	2,302	57,554	73,738
Rec Center 400 4th Ave W	11,102	105,140	100	75.1	15,020	105,140	120,160	7,780	194,509	249,205
			75	56.3	11,265	78,855	90,120	5,835	145,882	186,904
			50	37.6	7,510	52,570	60,080	3,890	97,255	124,603
			25	18.8	3,755	26,285	30,040	1,945	48,627	62,301
Public Works 2020 6th St E	9,233	103,340	100	73.8	14,763	103,340	118,103	7,647	191,179	244,939
			75	55.4	11,072	77,505	88,577	5,735	143,384	83,704
			50	36.9	7,381	51,670	59,051	3,824	95,590	122,469
			25	18.5	3,691	25,835	29,526	1,912	47,795	61,235
Airport 50511 State Hwy 112	7,348	74,280	100	53.1	10,611	7,4280	84,891	5,497	137,418	17,6060
			75	39.8	7,959	5,5710	63,669	4,123	103,064	13,2045
			50	26.5	5,306	3,7140	42,446	2,748	68,709	8,8030
			25	13.3	2,653	1,8570	21,223	1,374	34,355	4,4015

Solar*Connect Per Building

If the City chose to buy subscriptions for the Xcel Solar*Connect program, they would be purchasing credits per building, not overall energy usage. However, assuming the City could purchase up to 25 percent of its electricity usage or its total overall energy usage in a given year through this program, we estimate an upfront investment of just under $614,000 to cover electricity and just over $1.6 million for its overall energy usage with a 25 year payback of approximately $1.3 million and $3.5 million respectively.

Figure 17. Xcel Solar*Connect Program Estimates for Overall Electricity Usage

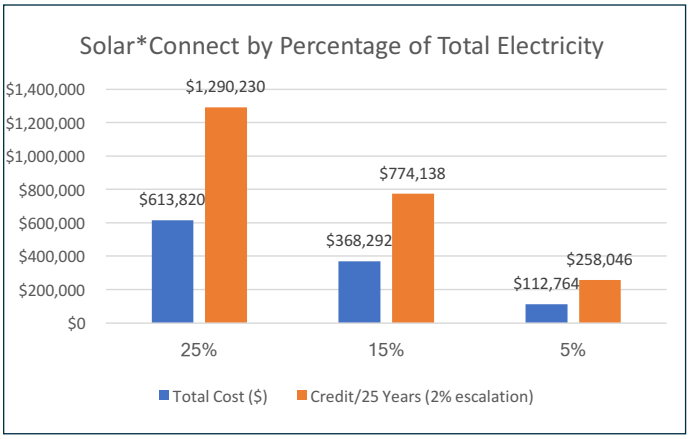
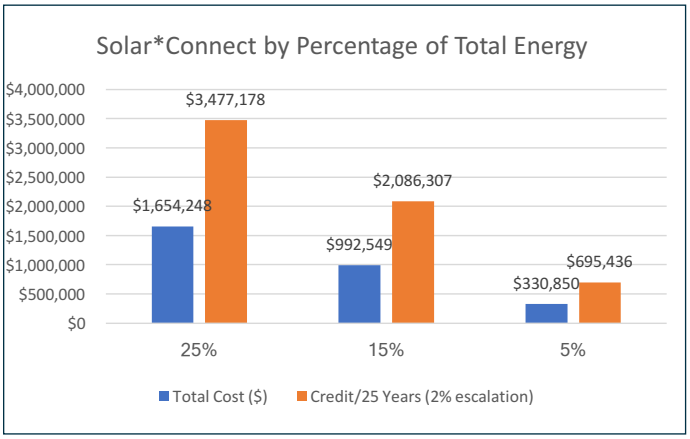


Figure 18. Xcel Solar*Connect Program Estimates for Overall Energy Usage



Solar*Connect by Building

Wastewater Treatment Plant
(1901 Knight Rd)

The top energy consumer is the wastewater treatment plant with an annual usage of 921,530 kWh (an annual cost of $77,279.30). A 100 percent offset for electricity would require a subscription through Solar*Connect equal to 658.2 kW and cost a total of $1,053,177. With an annual bill credit of $64,000, the payback time would be 12.9 years including a 2 percent energy cost inflation. At the end of 25 years, the City would have saved a total of $2,037,000 in energy payments. If the City chose 75 percent, 50 percent, and 25 percent energy offset subscriptions, the overall savings would be $1,527,000, $1,018,000, and $509,000 respectively, all with a simple pay-back of 12.9 years. Because this building uses so much electricity, the credit rate with Xcel is $0.069 instead of the standard $0.074, making the annual credit less and payback time longer than other City buildings.

Main Lift Station
(314 11th Ave E)

The second highest energy consumer is the main lift station with an annual usage of 261,057 kWh and annual electrical invoice of $47,207. Due to the annual usage, this building also qualifies for a lower $0.069 credit, making the payback time 12.9 years. To offset 100 percent of the annual electricity consumption, a subscription of 187 kW is needed, which would cost a total of $298,000 and offer an annual bill credit of $18,000. After the 25-year contract expires, the City would have saved a total of $577,000 (adjusted for a 2 percent energy cost inflation). Offsets at 75 percent, 50 percent, and 25 percent would save the City a total of $433,000, $288,000, and $144,000 respectively, over the 25 years.

Fire Station
(215 6th St E)

The City's new fire and ambulance station uses 178,280 kWh of electricity annually, amounting to $17,150 in annual invoices. If this building were to offset 100 percent of the electricity needs, it would cost $203,748. This investment would produce an annual credit of $13,000, saving the City a total of $330,000 over the lifetime of the contract. Since the fire station would be credited at the standard $0.074 rate, its payback time is slightly faster than the wastewater treatment facilities at 12.1 years.

Vaughn Publi Library
(502 Main St)

City Hall
(601 Main St)

City Hall uses an average of 147,120 kWh annually, with a bill of $14,909. Purchasing a Solar*Connect subscription to cover 100 percent of the electricity needs would cost a total of $168,137, with an annual credit of $11,000, and would save the City $349,000 over the lifetime of the contract (payoff after 12.1 using the $0.074 credit rate). Purchasing 75 percent, 50 percent, and 25 percent coverage would save the City $262,000, $174,000, and $87,000 respectively at the end of 25 years.

Vaughn Library uses 124,440 kWh annually with an annual electric invoice of $14,014. At 100 percent offset of annual electricity usage, the City would require a subscription size of 89 kW, which would cost a total of $142,217. The payback period is 12.1 years with the annual credit of $9,000, saving the City a total of $295,000 over the lifetime of the contract. Purchasing 75 percent, 50 percent, and 25 percent coverage would save the City $221,000, $147,000, or $74,000 respectively.

Solar*Connect by Building

Bretting Recreation Center
(400 $th Ave W)

Bretting Recreation Center uses 105,140 kWh of electricity per year and has an annual energy bill of $11,102. Covering 100 percent of the electricity needs for this location would cost $120,160, offer an annual credit of $8,000, and save the City $249,000 over the 25 years. Purchasing a 75 percent offset would save $187,000, a 50 percent offset would save $125,000, and 25 percent would save $62,000 over the lifetime of the contract.

Public Works
(2020 6th St E)

Ashland Public Works uses an average of 103,340 kWh for its electricity needs and pays $9,233 in electricity costs per year. Covering 100 percent of this buildings electricity usage needs would cost $118,103 upfront, with an annual credit of $8,000. This would produce a payback rate of 12.1 years, saving the City $245,000 over the life of the contract.

JFK Memorial Airport
(50511 State Highway 112)

Lastly, the City's airport uses an average of 74,280 kWh per year costing $7,348. Offsetting 100 percent of this electricity consumption with Solar*Connect would cost $84,891 and generate an annual credit of $5,000. The payback time for this, like the other buildings rated at $0.074 credit, would be 12.1 years. A total offset of energy would save the City $176,000. With 75 percent, 50 percent, and 25 percent, the City would save $132,000, $88,000, and $44,000 over the lifetime of the contracts, respectfully.

OPTION 2: City Owned Solar Installation

Another option for the City to consider is to install solar modules itself on City owned buildings and property. The cost of purchasing and installing its own solar arrays, as well as the economic benefits, are summarized in the appendix. Owning its own solar arrays would probably require larger upfront costs[7] but may provide greater long-term economic returns. Rather than receiving credits on electricity bills as would be the case with subscribing to Xcel's solar garden, the electricity created by City-owned arrays would be used on site and net metered, with any surplus sold to Xcel at a negotiated rate.

Three important differences between City-owned arrays and a subscription to the Xcel solar garden include:

1. ongoing maintenance costs must be borne by the City
2. a longer duration of benefit
3. a greater rate of return

Although maintenance requirements for solar arrays tend to be the smallest of any form of electricity generation, annual maintenance and operation costs may amount to between 0.5 percent and 1.5 percent of total system cost. Despite this added expense, the lifespan of solar modules is conservatively estimated at 40 years, considerably longer than the 25-year subscription offered by Xcel, and solar arrays generally outlive this conservative estimate. As a result, the savings from City-owned arrays could accumulate over the years to become substantially more than the benefits achieved through the Solar*Connect program. In addition, City-owned arrays directly offset electricity that would otherwise need to be purchased at the full retail rate (currently $0.12/kWh). Hence, the City would effectively be paying itself $0.12/kWh rather than receiving a $0.074/kWh credit as offered through the Solar*Connect program.

Xcel's current energy policy does not allow a customer to "overproduce" in any one location. This policy limits the benefits that the City might realize by creating a single large solar field, since electricity from this installation could not offset the combined electricity consumption of multiple City-owned premises. At best, the energy would be sold back at a much lower commercial rate (currently 3-4 cents per kWh) for any installation over 100 kW. In order for Xcel to offer net-metering, each solar array must be located on the premise it serves. Hence, building-specific arrays that reduce the net electricity requirements of the building appear to be the most favorable option. These arrays may be roof mounted or located adjacent the building. As noted earlier, most of the City's energy is used by only a few buildings. Integrating solar into these select sites may offer the most economical benefits. These installations could be done in stages, employing the savings from one installation to help fund the next, creating ongoing economic returns. Buildings that offer poor solar options, such as City Hall, would do better to reduce energy demands of the building and/or buy into a solar garden program.

[7] For this report we use $2.50 per watt, rather than the $1.60 per watt offered by Xcel Solar*Connect program

Table 6. City Owned Solar Modules[8] (4/17-3/18)

Cost ($)	kWh	% Offset	Installation Size (kWh)	Total Investment ($)	Annual Bill Credit Estimate ($)	Savings/25 Yrs	Savings/25 yrs (0.5% annual degradation)	Savings/25 yrs (2%escalation)	Savings/25 yrs (degradation & escalation)	Savings/40 yrs	Savings/40 yrs (0.5% annual degradation)	Savings/40 yrs (2% escalation)	Savings/40 yrs (degradation & escalation)	Payback(yrs)	Payback with degradation & escalation
233,066	2,151,141	100	1,537	3,842,796	233,066	5,826,639	5,140,379	7,607,337	7,569,300	10,201,826	7,622,419	12,109,342	14,274,008	16.5	12.7
		75	1,153	2,881,782	174,799	4,369,979	3,855,284	5,700,301	5,671,800	9,232,642	5,711,603	9,072,198	10,695,746	16.5	12.7
		50	768	1,920,776	116,533	2,913,320	2,570,190	3,796,249	3,777,268	18,262,592	3,803,777	6,040,680	7,123,083	16.5	12.7
		25	384	959,093	58,266	1,456,660	1,285,095	1,890,799	1,881,345	7,268,999	1,894,545	3,045,080	3,547,796	16.5	12.7

Table 7. City Owned Solar modules Estimates per Property (2/16-3/18)

Name Address	Avg $/yr	Avg kWh/yr	% Offset	Subscription Size (kWh)	Total ($)	Annual Savings ($)	Simple Savings/25 yrs	Complicated Savings/ 25 yrs	Simple Savings/40 yrs	Complicated Savings/40 yrs	Payback (yrs)	Payback 2% escalation (yrs)
Wastewater Utility 1901 Knight Rd	77,279	921,530	100	658.2	1,645,589	77,279	1,931,982	2,512,161	3,471,217	4,737,373	21.3	16.4
			75	493.7	1,234,192	57,959	1,448,987	1,884,120	3,059,820	3,553,030	21.3	16.4
			50	329.1	822,795	38,640	965,991	1,256,080	2,648,423	2,368,687	21.3	16.4
			25	164.6	19,320	19,320	482,996	628,040	2,237,025	1,184,343	21.3	16.4
Main Lift Station 314 11th Ave E	47,207	261,057.5	100	186.5	466,174	47,207	31,180,182	1,534,593	1,995,954	2,893,900	9.9	7.6
			75	139.9	349,631	35,405	885,1367	1,150,945	1,879,410	2,170,425	9.9	7.6
			50	93.2	1233,087	23,604	590,091	767,297	1,762,866	1,446,950	9.9	7.6
			25	46.6	116,544	11,802	295,046	383,648	1,646,323	723,475	9.9	7.6
Fire Station 215 6th St E	17,150	178,280	100	127.3	318,357	17,150	428,761	557,519	759,542	1,051,356	18.6	14.3
			75	95.5	238,768	12,863	321,571	418,139	679,952	788,517	18.6	14.3
			50	63.7	159,179	8,575	12,734	278,759	600,363	525,678	18.6	14.3
			25	31.8	79,589	4,288	214,381	107,190	139,380	520,774	18.6	14.3
City Hall 601 Main St W	14,909	147,120	100	105.1	262,714	14,909	372,731	484,663	657,043	913,965	17.6	13.6
			75	78.8	197,036	11,182	279,548	363,497	591,364	685,474	17.6	13.6
			50	52.5	131,357	7,455	186,365	242,331	525,685	456,983	17.6	13.6
			25	26.3	65,679	3,727	93,183	121,166	460,007	228,491	17.6	13.6
Vaughn Library 502 Main St W	14,014	124,440	100	88.9	222,214	14,014	350,356	455,569	611,890	859,101	15.9	12.2
			75	66.7	166,661	10,511	262,767	341,676	556,336	644,325	15.9	12.2
			50	44.4	111,107	7,007	175,178	227,784	500,782	429,550	15.9	12.2
			25	22.2	55,554	3,504	87,589	113,892	445,229	214,775	15.9	12.2
Rec Center 400 4th Ave W	11,102	105,140	100	75.1	187,750	11,102	277,552	360,902	487,444	680,580	16.9	13.0
			75	56.3	140,813	8,327	208,164	270,676	440,506	510,435	16.9	13.0
			50	37.6	93,875	5,551	138,776	180,451	9393,569	340,290	16.9	13.0
			25	18.8	46,938	1,945	69,388	90,225	346,631	170,145	16.9	13.0
Public Works 2020 6th St E	9,233	103,340	100	73.8	184,536	9,233	230,830	300,149	411,947	566,015	20.0	15.4
			75	55.4	138,402	6,925	173,1223	225,112	365,813	424,511	20.0	15.4
			50	36.9	92,2678	4,617	115,415	150,075	319,679	283,007	20.0	15.4
			25	18.5	46,134	2,308	57,708	75,037	273,545	141,504	20.0	15.4
Airport 50511 State Hwy 112	7,348	74,280	100	53.1	132,643	7,348	183,689	238,852	324,536	450,420	18.1	13.9
			75	39.8	99,483	5,511	137,767	79,139	291,376	1337,815	18.1	13.9
			50	26.5	66,322	3,674	91,845	119,426	258,215	225,210	18.1	13.9
			25	13.3	33,161	1,837	45,923	59,713	225,054	112,605	18.1	13.9

[8] See appendix for cost breakdown per property and overall. These estimates do not include cost of maintenance. Prices can vary greatly depending on decisions made about type of panel and related parts as well as placement and installation requirements.

Direct Solar Install Per Building

As with the Solar*Connect program, the City of Ashland may choose to install solar modules on or near selected building. Assuming the City were to cover 25 percent of its electricity needs on an annual basis, we estimate an upfront cost of approximately $1 million and a payback of $1.8 million over 25 years. Similarly, if the City were to install enough solar energy to cover 25 percent of its total energy needs, we estimate an investment of approximately $2.6 million and a 25-year payback of $4.8 million.

Based on energy usage and roof design, property location, or land availability we suggest beginning discussions and further investigation for direct install at the properties shown below. Beginning with the largest energy users like the wastewater treatment plant will allow the City of Ashland to progress more quickly toward the overall goal of 25 percent renewable energy by 2025. Assuming no outside financial assistance, the solar resource of the Chequamegon Bay region offers a simple pay-back of approximately 17 years for City-owned installations.

Figure 19. Direct Solar Installation Estimates for Overall Electricity Usage

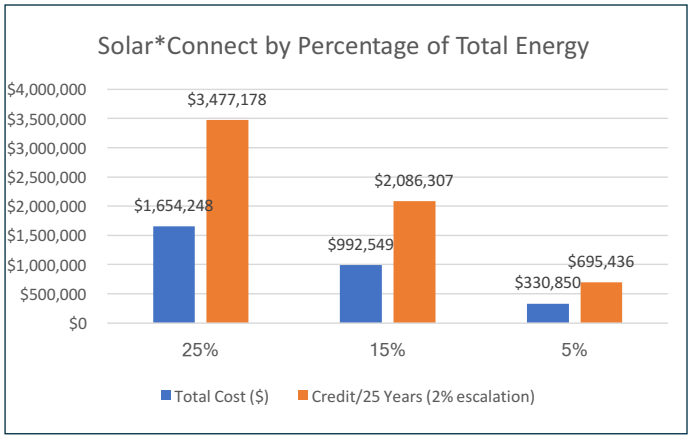


Figure 20. Direct Solar Installation Estimates for Overall Energy Usage

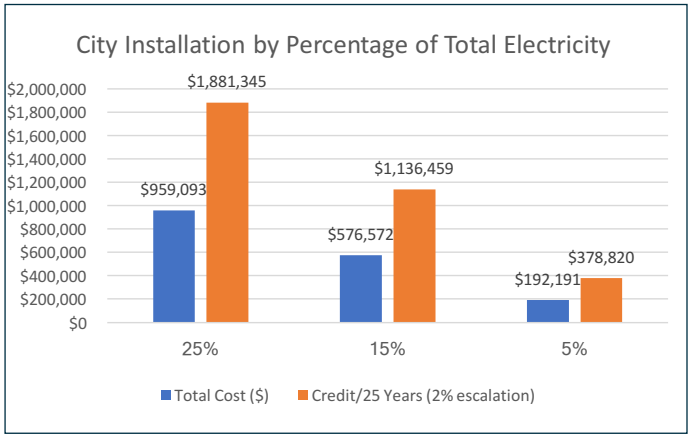
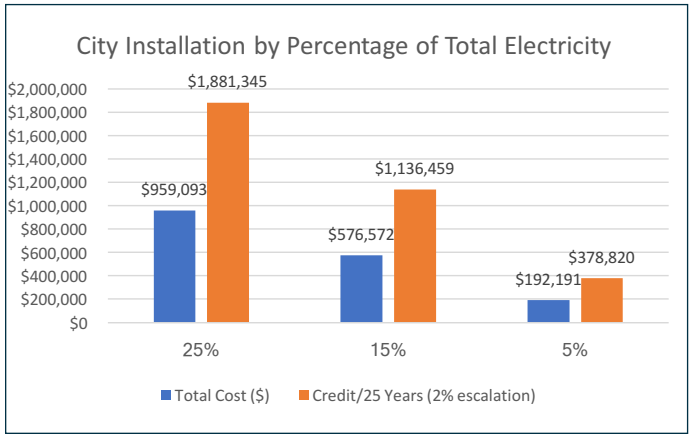


Figure 21. City Owned and Installed Solar Modules by Top Electricity Consuming Building



Direct Solar by Building

Wastewater Treatment Plant

The wastewater treatment plant is the City's largest user of electricity, consuming 921,530 kWh annually and costing the City $77,279 per year. Offsetting 100 percent of this location's electricity needs would cost approximately $1,600,000. The City would save roughly $3.1 million in avoided electricity bills over the 40-year anticipated life of the system. Covering 75 percent, 50 percent, or 25 percent of energy usage would save $2.3 million, $1.5 million, or $770,000 over the 40 years. Because this location makes up such a large proportion of the City's overall electricity needs, we estimate that by offsetting even 60 percent of the wastewater treatment plant's electricity requirements through solar modules would cover 25 percent of the entire City's electricity. To also account for other forms of energy (natural gas, gasoline, and diesel fuel, as well as electricity), then offsetting all of the wastewater treatment plant's electrical consumption as well as an additional 536,491 kWh would be required to provide 25 percent of the City's total energy through solar electricity alone.

Fire Station

The new fire and ambulance station consumes an estimated 178,000 kWh of electricity annually, costing the City $17,000. If the City were to install solar modules to cover 100 percent of the energy needs, it would cost approximately $318,357 and provide an annual savings of $17,000. After the investment is paid off, the City would save $17,000 per year for a total profit of $732,998 after the 40-year life of the system. Installing a system to offset 75 percent, 50 percent, or 25 percent of the usage would result in a total profit of $550,000, $366,000, and $183,000 respectively.

Bretting Recreation Center

Installing sufficient solar modules on the Bretting Recreation Center to offset 100 percent of its net electricity demands would require the installation of a 75 kW array and cost the City roughly $188,000 up front. A 75 kW array can be expected to generate the 106,000 kWh hours that are annually needed. The electrical generation of this array would save the City an estimated $11,000 every year, the cost of their current electricity invoice, and would break even with the investment after the 13th year (adjusted with a 2 percent energy inflation and 0.5 percent panel degradation per year). Over the 40 year estimated lifespan of the panels, the energy generated would save the City a total of $681,000 for a total profit of $492,000. Installing solar panels to cover roughly 75 percent, 50 percent, or 25 percent of total energy usage would result in a total profit of $370,000, $246,000, and $123,000 respectively over the 40-year life.

Public Works

The City of Ashland Public Works department uses roughly 103,000 kWh per year, costing the City $9,000 in electricity annually. Offsetting 100 percent of the usage with solar modules would cost a total of $184,000, with an estimated payback period of about 15 years. During the 40-year life of the modules, the City would save $381,000. Similarly, offsetting 75 percent, 50 percent, and 25 percent of the electricity usage would generate a net profit of $286,000, $110,000, and $95,000 respectively over the 40-year life.

Recommendations for Solar

Even though the Solar*Connect program offers stability with its guaranteed rates and no hidden costs (e.g. for maintenance), the 25-year contract limits the duration of the benefits and the City loses out on an additional 15 years or more of possible savings that could be achieved through installing its own solar arrays.

Installing photovoltaic modules on City-owned property would provide a better "credit" rate, as the credit would be the full retail value of the electricity (currently $0.12/kWh) rather than the lesser rate offered by Xcel ($0.074/kWh).

Both options (subscribing to Xcel's Solar*Connect program versus City-owned and maintained systems) require significant upfront capital. For the Solar*Connect program, no grants are available for purchasing solar production. However, grants may be available for installing solar on municipal buildings that could significantly help offset the costs (e.g., the Wisconsin Public Service Commission recently began a $5 million dollar grant pool to be used in energy innovation projects).

Other potential opportunities for grants include Focus on Energy and sustainability-focused loans such as the PACE (Property Assessed Clean Energy) administered by WECC (Wisconsin Energy Conservation Corporation). Power Purchase Agreements, or PPAs, are becoming more popular with solar installation, where a third party agrees to pay for the installation of the arrays, and the City would pay them through the savings the arrays produce. After an agreed-upon amount of time, the payments would cover the cost of the installation and the ownership would be transferred directly to the municipality.

Figure 22. Estimated Breakeven and Accumulated Payback for Wastewater Treatment

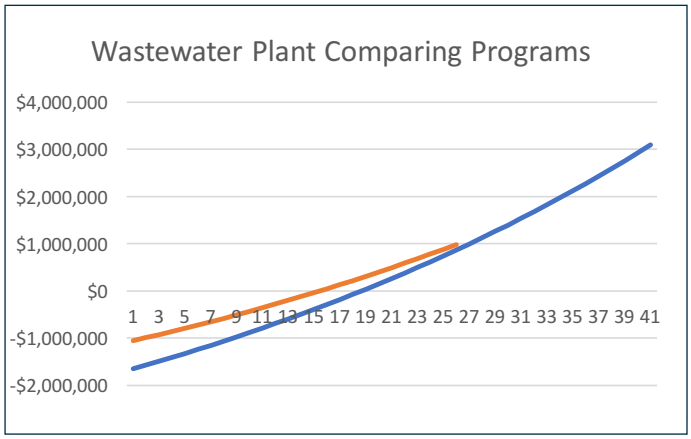


Figure 23. Estimated Breakeven and Accumulated Payback for the Fire Station

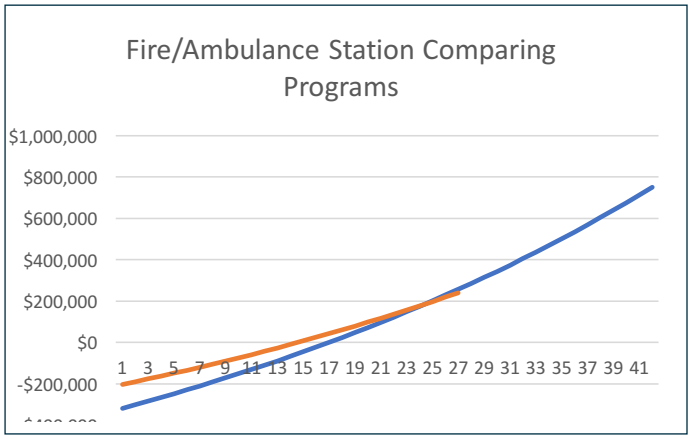


Figure 24. Estimated Breakeven and Accumulated Payback for City Hall

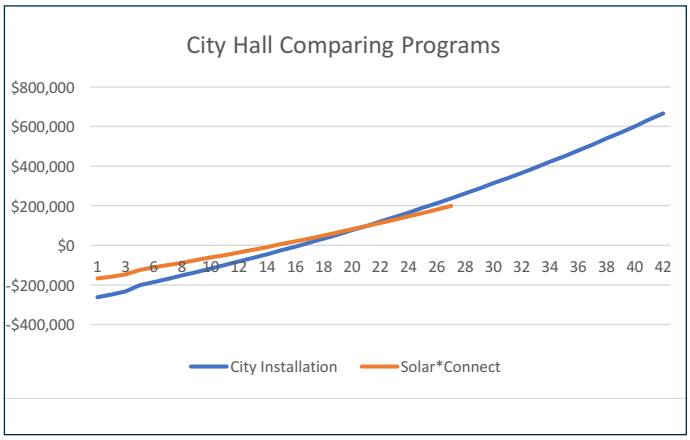


Figure 25. Estimated Breakeven and Accumulated Payback for Wastewater Treatment

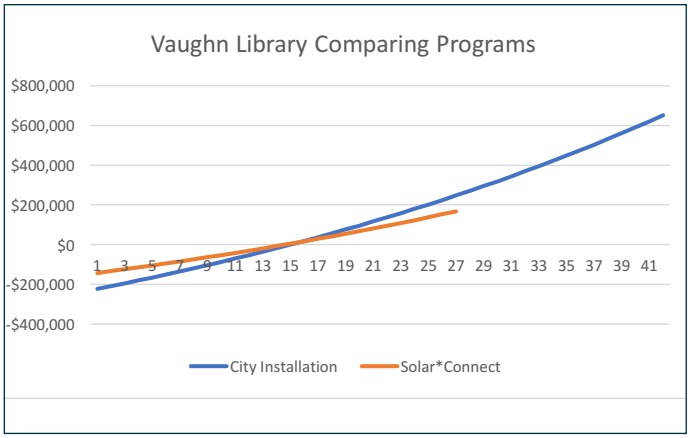


Figure 26. Estimated Breakeven and Accumulated Payback for the Bretting Center

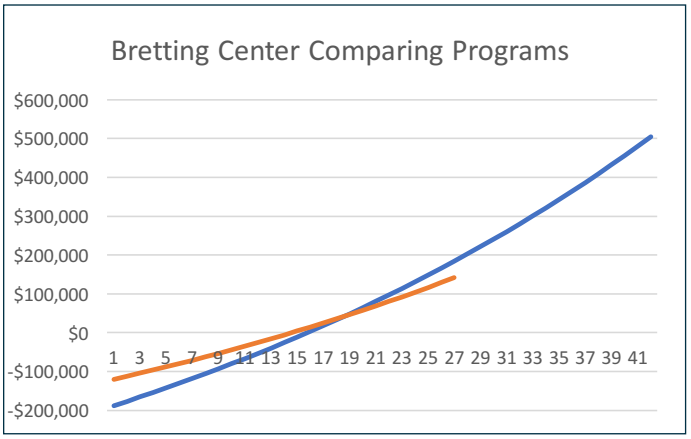


Figure 27. Estimated Breakeven and Accumulated Payback for Public Works

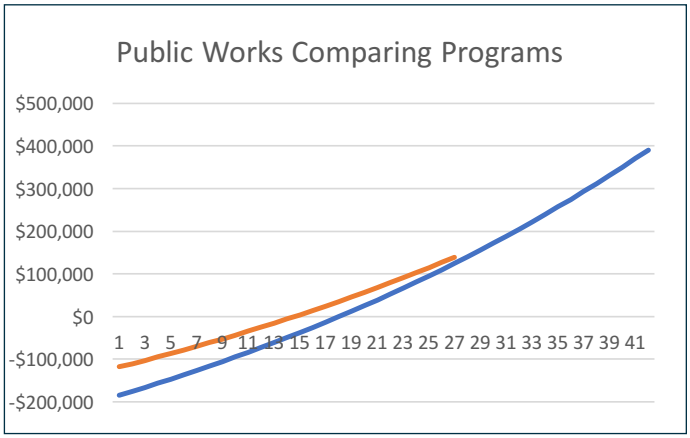
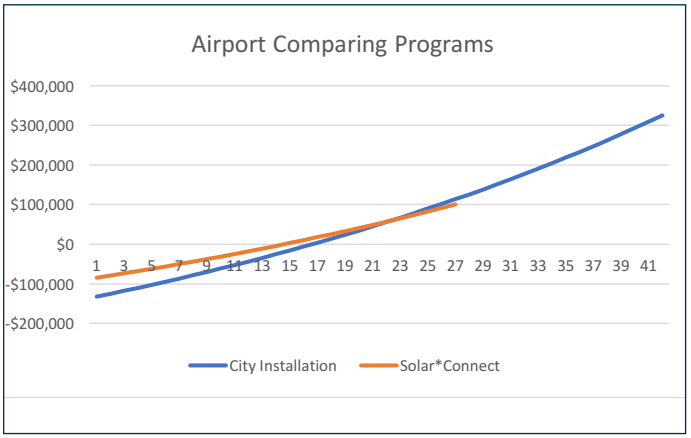


Figure 28. Estimated Breakeven and Accumulated Payback for the Airport



Fleet

In this section, we discuss the City of Ashland's fleet usage data. The City has been tracking fuel usage since 2011 using thirteen codes to categorize expenditures and quantity. Most but not all categories are complete. For example, the code "UTILITY" refers to water and wastewater utilities, and the data for these vehicles is only tracked when fuel is used or purchased from certain locations. Therefore, the data for this department is not completely accurate. However, to the best of our knowledge, most of the other department categories reflect correct fuel usages. We begin this section with an overview summary of fuel usage for the City since 2011. Next, we examine trends in the largest fuel consuming departments or divisions within the City. Finally, we end with recommendations for reducing fuel usage and improving fuel consumption.

Between 2011 and 2017, fuel usage by the City of Ashland remained relatively flat with between 40,014 and 47,641 gallons of fuel consumed per year.

Table 8. City of Ashland Departments and Codes for Tracking Fuel Usage

DEPARTMENT OR DIVISION	CODE
Ashland Housing Authority	AH
Ashland County Aging Unit	ACAU
Bay Area Rural Transit	BART
Bay Area Rural Transit	AFD
Ashland Ambulance	AMBL
Ashland Police Department	APD
Department of Public Works	DPW
Engineering Division	ENG
Parks Department	PARKS
Animal Warden	AW
Facilities Maintenance	FM
City Hall and Library	STAFF
Water and Wastewater Utilities	UTILTY

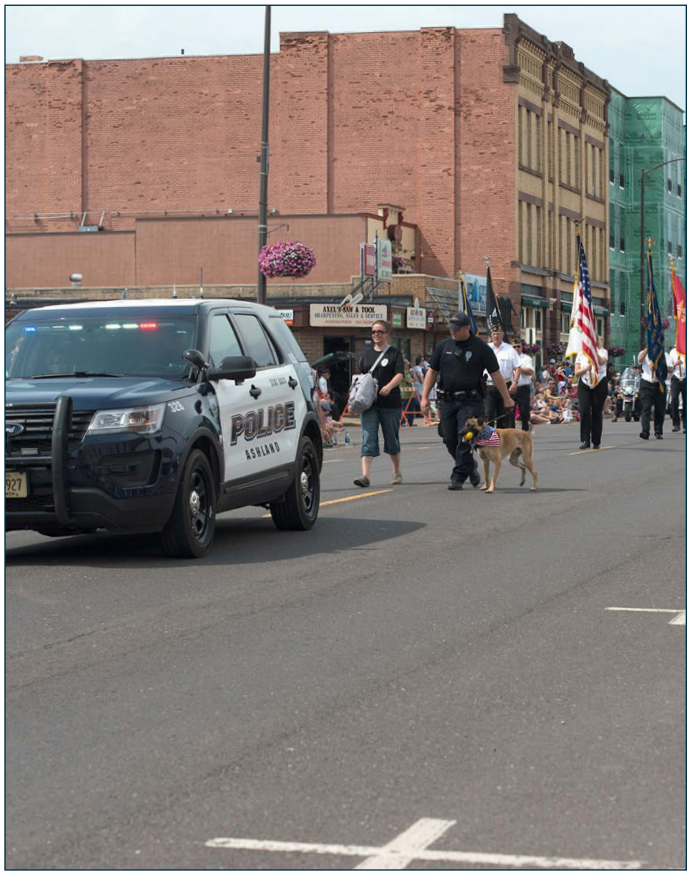
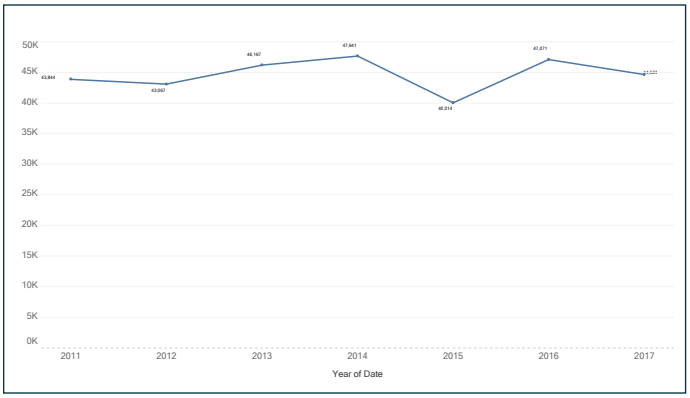
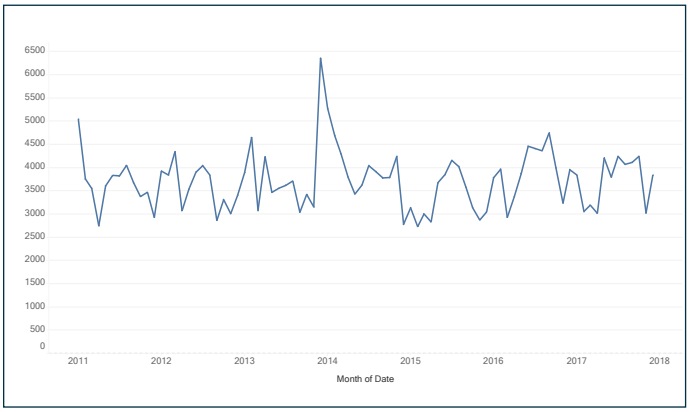


Figure 29. Total Fuel Usage (Gallons) by Year, January 2011- December 2017



Between 2011 and 2017, fuel usage by the City of Ashland remained relatively flat with between 40,014 and 47,641 gallons of fuel consumed per year.

Figure 30. Total Fuel Usage (Gallons) by Month, January 2011- December 2017



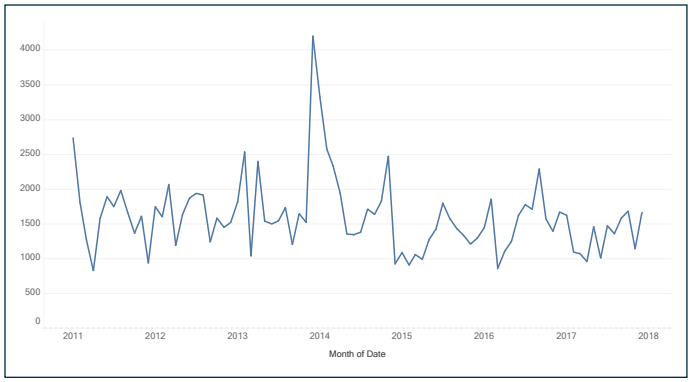
Monthly usage, again, remains consistent from 2011 to 2017 with annual highs typically occurring over the summer months. Occasionally, heavy snowfall months show a significant increase in fuel usage – e.g., the historical high in fuel consumption was December of 2013 with 6,357 gallons, which was the same month Ashland experienced snowfall in excess of thirty inches in a three-day period.

Top Consuming Departments

Isolating the top five largest users of fuel for vehicles, we discuss noticeable trends for each of these departments and provide recommendations for reducing fuel usage.

Public Works

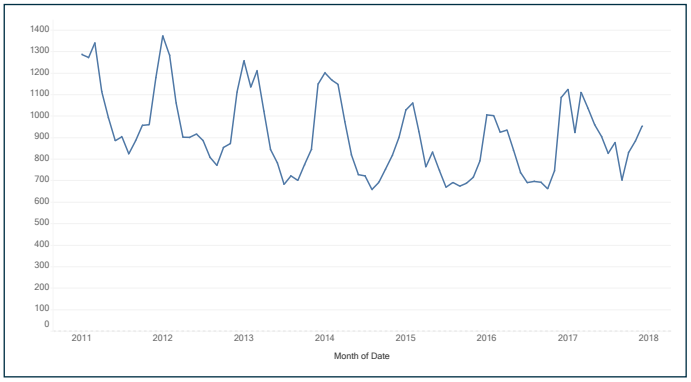
Figure 31. Total Fuel Usage (Gallons) for Public Works by Month, Jan 2011- Dec 2017



The Public Works Department has decreased its average fleet fuel use between 2011 and 2017. Other than the spike to over 3,000 gallons of use in January 2014, there is a decrease in usage from 2,700 gallons in January 2011 to 1,600 in January of 2017.

Ashland Police Department

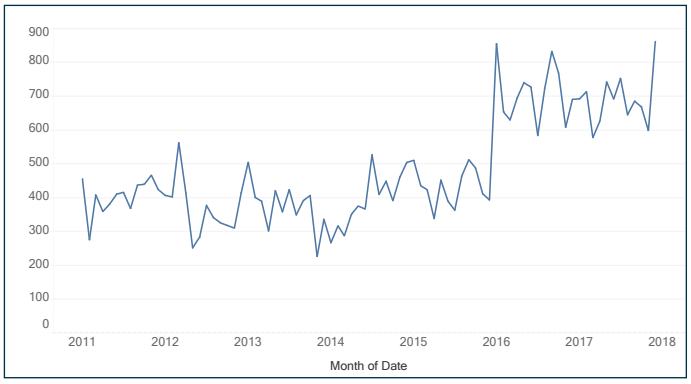
Figure 32. Total Fuel Usage (Gallons) for Ashland Police Department by Month, Jan 2011- Dec 2017



Ashland Police Department also has seen a decrease in overall fuel consumption between 2011 and 2017. The Department used 1,286 gallons in January 2011, whereas In January 2017 the department used 1,125 gallons. The lowest consuming months tend to be in August and September (e.g. in August 2014 only 658 gallons were used).

Ashland Police Department

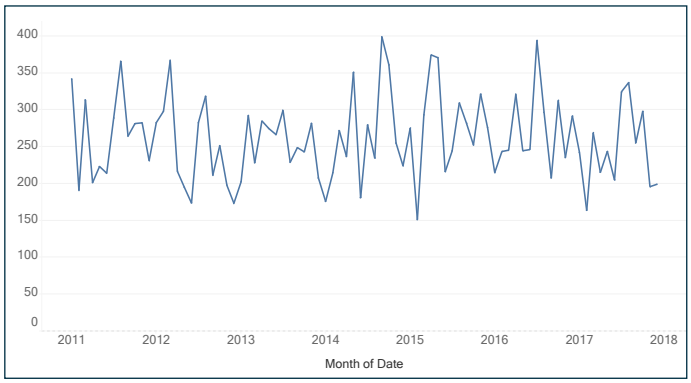
Figure 33. Total Fuel Usage (Gallons) for Ambulance Services by Month, Jan 2011- Dec 2017



Ambulance fuel usage in the City of Ashland has remained fairly consistent with the exception of the new ambulance station coming on-line in 2016 causing a jump in baseline from 393 gallons in December 2015 to 855 gallons in January of 2016. Before the ambulance station was completed, the department used an average of 4,726 every year (2011-2015); after the station was completed the facility used an average of 8,377 gallons a year (in 2016 and 2017).

Ashland Fire Department

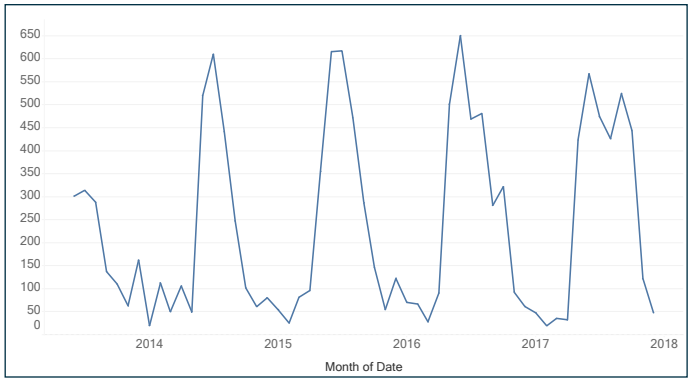
Figure 34. Total Fuel Usage (Gallons) for Ashland Fire Department by Month, Jan 2011- Dec 2017



The Ashland Fire Department has had extremely consistent usage of fleet gasoline between 2011 and 2017. Their lowest-consuming month was in February of 2015 when they used only 150 gallons, whereas their highest-consuming month in the 6 years studied was during July 2016 when the department used 393 gallons of fuel. On average, the Fire Department uses 263 gallons per month.

Parks and Recreation

Figure 35. Total Fuel Usage (Gallons) for Parks and Recreation by Month, Jun 2013- Dec 2017



Ashland Parks and Recreation department has wide annual fluctuations in fleet usage. The month with the lowest usage is consistently February, where in 2017 the department used 19 gallons of fuel, compared to June of 2016 when the usage topped 650 gallons. This trend conforms to the department's activities, most of which are during the summer.

Fleet Recommendations

To prevent unnecessary waste, City employees could undergo energy efficiency training that includes efficient management and deployment of vehicles, reduced idling times, proper and timely vehicle maintenance, prompt closing of doors in heated garages during cold weather, isolating garages from workshops and offices with well-sealing doors, and replacing inefficient vehicles when possible.

The possibility of incorporating electric vehicles into the City's fleet provides opportunities to save energy, as electric vehicles tend to be much more efficient than gasoline or diesel vehicles, requiring as little as one-third as much energy for the same output. City-owned electric vehicles could not only reduce fleet energy consumption, it could also demonstrate to the community the City's commitment to sustainability. However, it should be noted that the greater efficiency of electric vehicles means that they provide significantly less engine heat, an often essential benefit in the cold winter months. In order for vehicle occupants to remain comfortable during the winter, supplemental electric heat would likely be required, quickly eroding the benefits in energy efficiency. Hence, electric vehicles would most economically serve the City during the summer.

Another consideration is that rapid advances in electric vehicle technology promises to offer less expensive vehicles with greater travel ranges in the near future. Investing in electric vehicles now may be far more costly than in the near future and the vehicles may prove less functional and more problematic than continuing to use the City's existing fleet. Any investment in electric vehicles should be strategic and include consideration of seasonal constraints.

Appendix

Xcel Solar*Connect Community Estimates (2/16-3/18)

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Deposit Amount ($)	Remaining Amount ($)	Total Investment ($)	Annual Bill Credit Estimate ($)	Credit/ 25 Yrs	Credit/25 (yrs) 2 % escalation	Payback (yrs)	Payback with 2 % escalation (yrs)
Sm Gen Svc	1,548	11622	100	8.3	1,660	11,622	13,282	872	21,790	27,918	15.2	11.9
211 6th St W			75	6.2	1,245	8,716	9,961	654	16,343	20,938	15.2	11.9
303417099			50	4.2	830	5,811	6,641	436	10,895	13,959	15.2	11.9
			25	2.1	415	2,905	3,320	218	5,448	6,979	15.2	11.9
Airp Mintc Bldg	863	5740	100	4.1	820	5,740	6,560	425	10,619	13,605	15.4	12.1
50511 State Hwy 112			75	3.1	615	4,305	4,920	319	7,964	10,204	15.4	12.1
302190096			50	2.1	410	2,870	3,280	212	5,3010	6,803	15.4	12.1
			25	1.0	205	1,435	1,640	106	2,655	3,401	15.4	12.1
Krhr Pk Rstrm	2,512	19752	100	14.1	2,822	19,752	22,574	1,462	36,541	46,817	15.4	12.1
310 Prentice Ave N			75	10.6	2,116	14,814	16,930	1,096	27,406	35,112	15.4	12.1
302335868			50	7.1	1,411	9,876	11,287	731	18,271	23,408	15.4	12.1
			25	3.5	705	4,938	5,643	365	9,135	11,704	15.4	12.1
Hodkns Prk S.	427	2040	100	1.5	291	2,040	2,331	151	3,774	4,835	15.4	12.1
1222 7th St E			75	1.1	219	1,530	1,749	113	2,830	3,626	15.4	12.1
302347645			50	0.7	146	1,020	1,166	75	1,887	2,418	15.4	12.1
			25	0.4	73	510	583	38	944	1,209	15.4	12.1
Prntc Prk Camp	1,411	10180	100	7.3	1,454	10,180	11,634	753	18,833	24,129	15.4	12.1
515 Turner Road			75	5.5	1,091	7,635	8,726	565	14,125	18,097	15.4	12.1
302449200			50	3.6	727	5,090	5,817	377	9,417	12,064	15.4	12.1
			25	1.8	364	2,545	2,909	188	4,708	6,032	15.4	12.1
Lttle Lgu Prk	198	176	100	0.0	0	0	0	0	0	0	N/A	N/A
700 14th Ave W			75	0.0	0	0	0	0	0	0	N/A	N/A
302552596			50	0.0	0	0	0	0	0	0	N/A	N/A
			25	0.0	0	0	0	0	0	0	N/A	N/A
Sm Gen Svc	2,918	23260	100	16.6	3,323	23,260	26,583	1,721	43,031	55,131	15.4	12.1
423 6th St W			75	12.5	2,492	17,445	19,937	1,291	32,273	41,348	15.4	12.1
302562103			50	8.3	1,661	11,630	13,291	861	21,516	27,566	15.4	12.1
			25	4.2	831	5,815	6,646	430	10,758	13,783	15.4	12.1
E End Skt Rnk	366	1546	100	1.1	221	1,546	1,7667	114	2,860	3,664	15.4	12.1
1612 5th St E			75	0.8	166	1,160	1,325	86	2,145	2,748	15.4	12.1
302562242			50	0.6	110	773	883	57	1,430	1,832	15.4	12.1
			25	0.3	55	387	442	29	715	916	15.4	12.1
Hangar	212	235	100	0.2	34	235	269	18	441	565	15.2	11.9
50511 State Hwy 112			75	0.0	0	0	0	0	0	0	N/A	N/A
302644433			50	0.0	0	0	0	0	0	0	N/A	N/A
			25	0.0	0	0	0	0	0	0	N/A	N/A
Bandshell	479	2542	100	1.8	363	2,542	2,905	188	4,702	6,024	15.4	12.1
131 Lake Shore Dr W			75	1.4	272	1,906	2,178	141	3,526	4,518	15.4	12.1
302982746			50	0.9	182	1,271	1,452	94	2,351	3,012	15.4	12.1
			25	0.5	91	635	726	47	1,175	1,506	15.4	12.1
Vaughn Lbr	14,014	124440	100	88.9	17,777	124,440	142,217	9,209	230,214	294,950	15.4	12.1
502 Main St W			75	66.7	13,333	93,330	106,663	6,906	172,661	221,213	15.4	12.1
302984816			50	44.4	8,889	62,220	71,109	4,604	115,107	147,475	15.4	12.1
			25	22.2	4,444	31,110	35,554	2,302	57,554	73,738	15.4	12.1

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Deposit Amount ($)	Remaining Amount ($)	Total Investment ($)	Annual Bill Credit Estimate ($)	Credit/ 25 Yrs	Credit/25 (yrs) 2 % escalation	Payback (yrs)	Payback with 2 % escalation (yrs)
Trml Bldg	7,348	74280	100	53.1	10,611	74,280	84,891	5,497	137,418	176,060	15.4	12.1
50511 State Hwy 112			75	39.8	7,959	55,710	63,669	4,123	103,064	132,046	15.4	12.1
			50	26.5	5,306	37,140	42,446	2,748	68,709	88,030	15.4	12.1
302991848			25	13.3	2,653	18,570	21,223	1,374	34,355	44,015	15.4	12.1
Pn Prk Csns	242	462	100	0.3	66	462	527	35	865	1,109	15.2	11.9
901 7th Ave E			75	0.2	49	346	396	26	649	831	15.2	11.9
303093843			50	0.0	0	0	0	0	0	0	N/A	N/A
			25	0.0	0	0	0	0	0	0	N/A	N/A
Cld Stg Bldg	1,149	8153	100	5.8	1,165	8,153	9,317	603	15,082	19,323	15.4	12.1
2020 6th St E			75	4.4	873	6,114	6,988	452	11,312	14,492	15.4	12.1
303105193			50	2.9	582	4,076	4,659	302	7,541	9,662	15.4	12.1
			25	1.5	291	2,038	2,329	151	3,771	4,831	15.4	12.1
Rec Cntr	11,102	105140	100	75.1	15,020	105,140	120,160	7,780	194,509	249,205	15.4	12.1
400 4th Ave W			75	56.3	11,265	78,855	90,120	5,835	145,882	186,904	15.4	12.1
303112466			50	37.6	7,510	52,570	60,080	3,890	97,255	124,602	15.4	12.1
			25	18.8	3,755	26,285	30,040	1,945	48,627	62,301	15.4	12.1
Mas Bch Rstm	571	3201	100	2.3	457	3,201	3,658	240	6,001	7,688	15.2	11.9
3215 Lake Shore Dr W			75	1.7	343	2,400	2,743	180	4,501	5,766	15.2	11.9
			50	1.1	229	1,600	1,829	120	3,000	3,844	15.2	11.9
303197007			25	0.6	114	800	914	60	1,500	1,922	15.2	11.9
Hdk Pklgts	705	1645	100	1.2	235	1,645	1,880	123	3,084	3,952	15.2	11.9
1200 7th St E			75	0.9	176	1,234	1,410	93	2,313	2,964	15.2	11.9
303307401			50	0.6	118	823	940	62	1,542	1,976	15.2	11.9
			25	0.3	59	411	470	304	771	988	15.2	11.9
Prtc Prk Rst	544	2995	100	2.1	428	2,995	3,423	222	5,541	7,099	15.4	12.1
517 Turner Rd			75	1.6	321	2,246	2,567	166	4,156	5,324	15.4	12.1
303335742			50	1.1	214	1,498	1,711	1101	2,770	3,549	15.4	12.1
			25	0.5	107	749	856	55	1,385	1,775	15.4	12.1
Krhr Rv Prk	6,9712	54080	100	38.6	7,726	54,080	61,806	4,002	100,048	128,182	15.4	12.1
310 Prentice Ave N			75	29.0	5,794	40,560	46,354	3,001	75,036	96,136	15.4	12.1
			50	19.3	3,863	27,040	30,903	2,001	50,024	64,091	15.4	12.1
303389302			25	9.7	1,931	13,520	15,451	1,000	25,012	32,045	15.4	12.1
Mas Bch Pvl	296	940	100	0.7	134	940	1,074	70	1,738	2,227	15.4	12.1
3225 Lake Shore Dr W			75	0.5	1001	705	805	52	1,304	1,670	15.4	12.1
			50	0.3	67	470	537	35	869	1,113	15.4	12.1
303494786			25	0.0	0	0	0	0	0	0	N/A	N/A
Penn Prk Rst	312	1081	100	0.8	154	1,081	1,235	81	2,026	2,596	15.2	11.9
922 Willis Ave			75	0.6	116	810	926	61	1,519	1,947	15.2	11.9
303518678			50	0.4	77	540	617	41	1,013	1,298	15.2	11.9
			25	0.0	0	0	0	0	0	0	N/A	N/A
Pbl Wks Bld	9,233	103340	100	73.8	14,763	103,340	118,103	7,647	191,179	244,939	15.4	12.1
2020 6th St E			75	55.4	11,072	77,505	88,577	5,735	143,384	183,704	15.4	12.1
303580956			50	36.9	7,381	51,670	59,051	3,824	95,590	122,469	15.4	12.1
			25	18.5	3,691	25,835	29,526	1,9112	47,795	61,235	15.4	12.1

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Deposit Amount ($)	Remaining Amount ($)	Total Investment ($)	Annual Bill Credit Estimate ($)	Credit/ 25 Yrs	Credit/25 (yrs) 2 % escalation	Payback (yrs)	Payback with 2 % escalation (yrs)
City Hall	14,909	147120	100	105.1	21,017	147,120	168,137	10,887	272,172	348,707	15.4	12.1
601 Main St W			75	78.8	15,763	110,340	126,103	8,165	204,129	261,530	15.4	12.1
303590846			50	52.5	10,509	73,560	84,069	5,443	136,086	174,353	15.4	12.1
			25	26.3	5,254	36,780	42,034	2,722	68,043	87,177	15.4	12.1
Bvw Prk Rst	876	5763	100	4.1	823	5,763	6,586	426	10,662	13,660	15.4	12.1
1809 Lake Shore Dr E			75	3.1	617	4,322	4,940	3120	7,996	10,245	15.4	12.1
303603030			50	2.1	412	2,882	3,293	213	5,3301	6,830	15.4	12.1
			25	1.0	206	1,441	1,647	107	2,665	3,415	15.4	12.1
Marina	4,495	22280	100	15.9	3,183	22,280	25,463	1,649	41,218	52,809	15.4	12.1
300 Ellis Ave N			75	11.9	2,387	16,710	19,097	1,237	30,914	39,606	15.4	12.1
303705559			50	8.0	1,591	11,140	12,731	824	20,609	26,404	15.4	12.1
			25	4.0	796	5,570	6,366	412	10,305	13,202	15.4	12.1
Hgn Pk Eq Rm	319	1125	100	0.8	161	1,125	1,285	84	2,108	2,701	15.2	11.9
1120 7th St E			75	0.6	120	843	964	63	1,581	2,026	15.2	11.9
303820841			50	0.4	80	562	643	42	1,054	1,351	15.2	11.9
			25	0.2	40	281	321	21	527	675	15.2	11.9
W End Rnk	402	1929	100	1.4	276	1,929	2,205	145	3,617	4,634	15.2	11.9
601 Main St W			75	1.0	207	1,447	1,653	108.9	2,713	3,475	15.2	11.9
303825973			50	0.7	138	965	1,102	72	1,808	2,317	15.2	11.9
			25	0.3	69	482	551	36	904	1,158	15.2	11.9
Airport	288	880	100	0.6	126	880	1,006	66	1,650	2,114	15.2	11.9
50511 State Hwy 112 Gate			75	0.5	94	660	754	450	1,238	1,585	15.2	11.9
303963830			50	0.3	63	440	503	33	825	1,057	15.2	11.9
			25	0.0	0	0	0	0	0	0	N/A	N/A
St Lt Svc	775	10404	100	7.4	1,486	10,404	11,890	770	19,247	24,660	15.4	12.1
825 Main St W			75	5.6	1,115	7,803	8,918	577	14,436	18,495	15.4	12.1
304178140			50	3.7	743	5,202	5,945	385	9,624	12,330	15.4	12.1
			25	1.9	372	2,601	2,973	192	4,812	6,165	15.4	12.1
Gen TOD Svc	17,150	178280	100	127.3	25,469	178,280	203,749	13,193	329,818	422,563	15.4	12.1
215 6th St E			75	95.5	19,101	133,710	152,811	9,895	247,364	316,922	15.4	12.1
304500475			50	63.7	12,734	89,140	101,874	6,596	164,909	211,281	15.4	12.1
			25	31.8	6,367	44,570	50,937	3,298	82,455	105,641	15.4	12.1
Sm Gen Svc			100	0.0	0	0	0	0	0	0	N/A	N/A
323 Stuntz Ave N			75	0.0	0	0	0	0	0	0	N/A	N/A
304520171			50	0.0	0	0	0	0	0	0	N/A	N/A
			25	0.0	0	0	0	0	0	0	N/A	N/A
Wstwtr Utility	77,279	921530	100	658.2	131,647	921,530	1,053,177	63,586	1,589,639	2,036,646	16.6	12.9
1901 Knight Rd			75	493.7	98,735	691,146	789,883	47,689	1,192,229	1,527,484	16.6	12.9
302154453			50	329.1	65,824	460,765	526,589	31,793	794,820	1,018,323	16.6	12.9
			25	164.6	32,912	230,383	263,294	15,896	397,410	509,161	16.6	12.9
Main Lftstn	47,207	261058	100	186.5	37,2934	261,058	298,351	18,013	450,324	576,955	16.6	12.9
314 11th Ave E			75	139.9	27,970	195,793	223,764	13,510	337,743	432,717	16.6	12.9
302152769			50	93.2	18,647	130,529	149,176	9,006	225,162	288,478	16.6	12.9
			25	46.6	9,323	65,264	74,588	4,503	112,581	144,239	16.6	12.9

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Deposit Amount ($)	Remaining Amount ($)	Total Investment ($)	Annual Bill Credit Estimate ($)	Credit/ 25 Yrs	Credit/25 (yrs) 2 % escalation	Payback (yrs)	Payback with 2 % escalation (yrs)
6th Ave Lftstn	4,080	33380	100	23.8	4,769	33,380	38,149	2,470	61,753	79,118	15.4	12.1
523 Lake Shore Dr			75	17.9	3,576	25,035	28,611	1,853	46,315	59,338	15.4	12.1
			50	11.9	2,384	16,690	19,074	1,235	30,877	39,559	15.4	12.1
302307545			25	6.0	1,192	8,345	9,537	618	15,438	19,779	15.4	12.1
27th Ave Lftstn	750	4354	100	3.1	622	4,354	4,976	322	8,055	10,320	15.4	12.1
2614 Lake Shore Dr			75	2.3	467	3,266	3,732	242	6,041	7,740	15.4	12.1
			50	1.6	311	2,177	2,488	161	4,027	5,160	15.4	12.1
303562018			25	0.8	1556	1,089	1,244	81	2,014	2,580	15.4	12.1
Trnr Rd Lftstn	1,111	7193	100	5.1	1,028	7,193	8,221	532	13,307	17,049	15.4	12.1
524 Turner Rd			75	3.9	771	5,395	6,165	399	9,980	12,787	15.4	12.1
303648977			50	2.6	514	3,597	4,110	266	6,654	8,525	15.4	12.1
			25	1.3	257	1,798	2,055	133	3,327	4,262	15.4	12.1
TOTAL	102,638	924627	**100**	1537.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			75	1152.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			50	768.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			25	383.6	32,888	580,932	613,820	40,282	1,007,048	1,290,230	15.2	11.9
		200KW Max		200.0	40,000	280,000	320,000	21,000	525,000	672,630	15.2	11.9

City Owned Solar Installation (2/16-3/18)

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Total Investment ($)	Annual Bill Credit Estimate ($)	Savings/25 Yrs	Savings/25 yrs (0.5% annual degradation)	Savings/25 yrs (2%escalation)	Complicated Savings/ 25 yrs (degradation & escalation)	Simple Savings/40 yrs (conservative est. of life modules)	Savings/40 yrs (0.5% annual degradation)	Savings/40 yrs (2% escalation)	Complicated Savings/ 40 yrs (degradation & escalation)	Payback(yrs)	Payback with 2 % escalation (yrs)
Sm Gen Svc	1,548	11622	100	8.3	20,753	1,548	38,700	34,149	50,586	50,333	66,726	50,682	95,393	94,916	13.4	10.3
211 6th St W			75	6.2	15,565	1,161	29,031	25,612	37,939	37,750	61,538	38,011	71,545	71,187	13.4	10.3
303417099			50	4.2	10,376	774	19,354	17,075	25,293	25,166	56,350	25,341	47,697	47,458	13.4	10.3
			25	2.1	5,188	387	9,677	8,537	12,646	12,583	51,162	12,670	24,235	23,729	13.4	10.3
Airp Mintc Bldg	862.57	5740	100	4.1	10,250	862.57	21,564	19,024	28,181	28,040	36,870	28,234	53,143	52,877	11.9	9.1
50511 State Hwy 112			75	3.1	7,688	647	16,173	14,268	21,136	21,030	34,308	21,176	39,857	39,658	11.9	9.1
302190096			50	2.1	5,125	431	10,782	9,512	14,090	14,020	31,745	14,117	26,571	26,439	11.9	9.1
			25	1.0	2,563	216	5,391	4,756	7,045	7,010	29,183	7,059	13,501	13,219	11.9	9.1
Krhr Pk Rstrm	2,511.59	19752	100	14.1	35,271	2,512	62,790	55,394	82,056	81,646	108,609	82,211	154,739	153,965	14.0	10.8
310 Prentice Ave N			75	10.6	26,454	1,884	47,092	41,547	61,542	61,234	99,792	61,659	116,054	115,474	14.0	10.8
302335868			50	7.1	17,636	1,256	31,395	27,697	41,028	40,823	90,974	41,106	77,370	76,983	14.0	10.8
			25	3.5	8,818	628	15,697	13,849	20,5134	20,411	82,156	20,553	39,313	38,491	14.0	10.8
Hodkns Prk S.	427	2040	100	1.5	3,643	427	10,684	9,425	13,962	13,892	17,935	13,988	26,329	26,197	8.5	6.6
1222 7th St E			75	1.1	2,732	321	8,013	7,069	10,471	10,419	17,025	10,491	19,747	19,648	8.5	6.6
302347645			50	0.7	1,821	2134	5,342	4,713	6,981	6,946	16,114	6,994	13,165	13,090	8.5	6.6
			25	0.4	911	107	2,671	2,356	3,490	3,473	15,203	3,497	6,689	6,549	8.5	6.6
Prntc Prk Camp	1,411	10180	100	7.3	18,179	1,411	35,279	31,124	46,104	45,873	60,645	46,191	86,942	86,507	12.9	9.9
515 Turner Road			75	5.5	13,634	1,058	26,459	23,343	34,578	34,405	56,100	34,643	65,206	64,880	12.9	9.9
302449200			50	3.6	9,089	706	17,640	15,562	23,052	22,937	51,555	23,096	43,471	43,253	12.9	9.9
			25	1.8	4,545	353	8,820	7,781	11,526	11,468	47,011	11,548	22,088	21,627	12.9	9.9
Lttle Lgu Prk	198	176	00	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
700 14th Ave W			75	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
302552596			50	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
			25	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
Sm Gen Svc	2,918	23260	100	16.6	41,536	2,918	72,942	64,351	95,323	94,846	126,299	95,504	179,758	178,859	14.2	10.9
423 6th St W			75	12.5	31,152	2,188	54,706	48,263	71,492	71,135	115,915	71,628	134,818	134,144	14.2	10.9
302562103			50	8.3	20,768	1,459	36,471	32,175	47,661	47,423	105,532	47,752	89,879	89,429	14.2	10.9
			25	4.2	10,384	729	18,235	16,088	23,831	23,712	95,148	23,876	45,669	44,715	14.2	10.9
E End Skt Rnk	366	1546	100	1.1	2,761	366	9,154	8,075	11,962	11,902	15,283	11,985	22,558	22,445	7.5	5.8
1612 5th St E			75	0.8	2,071	275	6,865	6,057	8,972	8,927	14,593	8,989	16,918	16,834	7.5	5.8
302562242			50	0.6	1,380	183	4,577	4,038	5,981	5,951	13,903	5,992	11,279	11,223	7.5	5.8
			25	0.3	690	92	2,288	2,019	2,991	2,976	13,213	2,996	5,731	5,611	7.5	5.8

City Owned Solar Installation (2/16-3/18) *continued*

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Total Investment ($)	Annual Bill Credit Estimate ($)	Savings/25 Yrs	Savings/25 yrs (0.5% annual degradation)	Savings/25 yrs (2%escalation)	Complicated Savings/ 25 yrs (degradation & escalation)	Simple Savings/40 yrs (conservative est. of life modules)	Savings/40 yrs (0.5% annual degradation)	Savings/40 yrs (2% escalation)	Complicated Savings/ 40 yrs (degradation & escalation)	Payback(yrs)	Payback with 2 % escalation (yrs)
Hangar	212	235	100	0.2	420	212	5,37	4,682	6,935	6,901	8,590	6,948	13,070	13,013	2.0	1.5
50511 State Hwy 112			75	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
			50	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
302644433			25	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
Bandshell	479	2542	100	1.8	4,538	479	11,986	10,575	15,664	15,586	20,226	15,694	29,539	29,391	9.5	7.3
131 Lake Shore Dr W			75	1.4	3,404	360	8,990	7,931	11,748	11,689	19,092	11,770	22,154	22,043	9.5	7.3
			50	0.9	2,269	240	5,993	5,287	7,832	7,793	17,957	7,847	14,769	14,696	9.5	7.3
302982746			25	0.5	1,135	120	2,997	2,644	3,916	3,896	16,822	3,923	7,505	7,348	9.5	7.3
Vaughn Lbr	14,014	124440	100	88.9	222,214	14,014	350,356	309,091	457,858	455,569	611,890	458,725	863,418	859,101	15.9	12.2
502 Main St W			75	66.7	166,661	10,511	262,767	231,818	343,393	341,676	556,336	344,044	647,563	644,325	15.9	12.2
302984816			50	44.4	111,107	7,007	175,178	154,546	228,929	227,784	500,782	229,363	431,709	429,550	15.9	12.2
			25	22.2	55,554	3,504	87,589	77,273	114,464	113,892	445,229	114,681	219,358	214,775	15.9	12.2
Trml Bldg	7,348	74280	100	53.1	132,643	7,348	183,689	162,054	240,051	238,851	324,536	240,506	452,683	450,420	18.1	13.9
50511 State Hwy 112			75	39.8	99,482	5,511	137,767	121,541	180,039	179,138	291,375	180,3806	339,513	337,815	18.1	13.9
			50	26.5	66,321	3,674	91,844	81,027	120,026	119,426	258,214	120,253	226,342	225,210	18.1	13.9
302991848			25	13.3	33,161	1,837	45,922	40,514	60,013	59,713	225,054	60,127	115,008	112,605	18.1	13.9
Pn Prk Csns	242	462	100	0.3	824	242	6,047	5,335	7,903	7,863	9,869	7,918	14,903	14,828	3.4	2.6
901 7th Ave E			75	0.2	618	181	4,535	4,001	5,927	5,897	9,663	5,938	11,177	11,121	3.4	2.6
303093843			50	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
			25	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
Cld Stg Bldg	1,149	8153	100	5.8	14,558	1,149	28,725	25,342	37,539	37,351	49,322	37,610	70,790	70,436	12.7	9.7
2020 6th St E			75	4.4	10,919	862	21,544	19,006	28,154	28,013	45,682	28,207	53,092	52,827	12.7	9.7
303105193			50	2.9	7,279	575	14,362	12,671	18,769	18,676	42,043	18,805	35,395	35,218	12.7	9.7
			25	1.5	3,640	287	7,181	6,335	9,385	9,338	38,403	9,402	17,985	17,609	12.7	9.7
Rec Cntr	11,102	105140	100	75.1	187,750	11,102	277,552	244,862	362,715	360,902	487,444	363,402	684,000	680,580	16.9	13.0
400 4th Ave W			75	56.3	140,813	8,327	208,164	183,647	272,037	270,676	440,506	272,552	513,000	510,435	16.9	13.0
303112466			50	37.6	93,875	5,551	138,776	122,431	181,358	180,451	393,569	181,701	342,000	340,290	16.9	13.0
			25	18.8	46,938	2,776	69,388	61,216	90,679	90,225	346,631	90,851	173,776	170,145	16.9	13.0
Mas Bch Rstm	571	3201	100	2.3	5,715	571	14,276	12,595	18,657	18,563	24,162	18,692	35,182	35,006	10.0	7.7
3215 Lake Shore Dr W			75	1.7	4,286	428	10,707	9,446	13,993	13,923	22,733	14,019	26,387	26,255	10.0	7.7
			50	1.1	2,858	286	7,138	6,297	9,328	9,282	21,304	9,346	17,591	17,503	10.0	7.7
303197007			25	0.6	1,429	143	3,569	3,149	4,664	4,641	19,876	4,673	8,938	8,752	10.0	7.7

City Owned Solar Installation (2/16-3/18) *continued*

Name Address ID	Average Annual Electric Invoice ($)	Average Annual Usage (kWh)	% Offset	Solar Subscription Size (kW)	Total Investment ($)	Annual Bill Credit Estimate ($)	Savings/25 Yrs	Savings/25 yrs (0.5% annual degradation)	Savings/25 yrs (2%escalation)	Complicated Savings/ 25 yrs (degradation & escalation)	Simple Savings/40 yrs (conservative est. of life modules)	Savings/40 yrs (0.5% annual degradation)	Savings/40 yrs (2% escalation)	Complicated Savings/ 40 yrs (degradation & escalation)	Payback (yrs)	Payback with 2 % escalation (yrs)
Hdk Pklgts	705	1645	100	1.2	2,938	705	17,615	15,540	23,020	22,905	28,862	23,063	43,410	43,193	4.2	3.2
1200 7th St E			75	0.9	2,203	528	13,211	11,655	17,265	17,178	28,128	17,297	32,557	32,395	4.2	3.2
303307401			50	0.6	1,469	352	8,807	7,770	11,510	11,452	27,393	11,532	21,705	21,596	4.2	3.2
			25	0.3	734	176	4,404	3,885	5,755	5,726	26,659	5,766	11,029	10,798	4.2	3.2
Prtc Prk Rst	544	2995	100	2.1	5,348	544	13,603	12,001	17,777	17,688	22,999	17,810	33,523	33,355	9.8	7.6
517 Turner Rd			75	1.6	4,011	408	10,202	9,000	13,332	13,266	21,662	13,358	25,142	25,016	9.8	7.6
303335742			50	1.1	2,674	272	6,801	6,000	8,888	8,844	20,325	8,905	16,761	16,678	9.8	7.6
			25	0.5	1,337	136	3,401	3,000	4,444	4,422	18,988	4,453	8,517	8,339	9.8	7.6
Krhr Rv Prk	6,972	54080	100	38.6	96,571	6,972	174,298	153,769	227,779	226,640	301,179	228,210	429,540	427,392	13.9	10.7
310 Prentice Ave N			75	29.0	72,429	5,229	130,723	115,327	170,834	169,980	277,037	171,158	322,155	320,544	13.9	10.7
303389302			50	19.3	48,286	3,486	87,149	76,885	113,889	113,320	252,894	114,105	214,770	213,696	13.9	10.7
			25	9.7	24,143	1,743	43,574	38,442	56,945	56,660	228,751	57,053	109,128	106,848	13.9	10.7
Mas Bch Pvl	296	940	100	0.7	1,678	296	7,412	6,539	9,672	9,622	12,245	9,705	18,237	18,145	5.7	4.4
3225 Lake Shore Dr W			75	0.5	1,258	222	5,559	4,904	7,253	7,217	11,826	7,279	13,677	13,609	5.7	4.4
303494786			50	0.3	839	148	3,706	3,270	4,835	4,811	11,406	4,852	9,118	9,073	5.7	4.4
			25	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
Penn Prk Rst	312	1081	100	0.8	1,929	312	7,812	6,892	10,209	10,158	12,945	10,229	19,253	19,156	6.2	4.7
922 Willis Ave			75	0.6	1,447	234	5,859	5,169	7,657	7,619	12,463	7,672	14,439	14,367	6.2	4.7
303518678			50	0.4	965	156	3,906	3,446	5,105	5,079	11,980	5,114	9,626	9,578	6.2	4.7
			25	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
Pbl Wks Bld	9,233	103340	100	73.8	184,536	9,233	230,830	203,643	301,658	300,149	411,947	302,229	568,859	566,015	20	15.4
2020 6th St E			75	55.4	138,402	6,925	173,123	152,732	226,243	225,112	365,813	226,672	426,644	424,511	20	15.4
303580956			50	36.9	92,268	4,617	115,415	101,822	150,829	150,075	319,679	151,115	284,429	283,007	20	15.4
			25	18.5	46,134	2,308	57,708	50,911	75,414	75,037	273,545	75,557	144,523	141,504	20	15.4
City Hall	14,909	147120	100	105.1	262,714	14,909	372,731	328,831	487,098	484,663	657,043	488,021	918,558	913,965	17.6	13.6
601 Main St W			75	78.8	197,036	11,182	279,548	246,623	365,324	363,497	591,364	366,016	688,919	685,474	17.6	13.6
303590846			50	52.5	131,357	7,455	186,365	164,415	243,549	242,331	525,685	244,010	459,279	456,983	17.6	13.6
			25	26.3	65,679	3,727	93,183	82,208	121,775	121,166	460,007	122,005	233,367	228,491	17.6	13.6
Bvw Prk Rst	876	5763	100	4.1	10,291	876	21,891	19,313	28,608	28,465	37,403	28,662	53,949	53,679	11.8	9.0
1809 Lake Shore Dr E			75	3.1	7,718	6567	16,418	14,485	21,456	21,349	34,830	21,497	40,462	40,259	11.8	9.0
303603030			50	2.1	5,146	438	10,946	9,656	14,304	14,233	32,257	14,331	26,974	26,840	11.8	9.0
			25	1.0	2,573	219	5,473	4,828	7,152	7,116	29,684	7,166	13,706	13,420	11.8	9.0

City Owned Solar Installation (2/16-3/18) *continued*

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Marina	4,495	22280	100	15.9	39,786	4,495	112,379	99,143	146,861	146,127	188,995	147,139	276,947	275,562	8.9	6.8
300 Ellis Ave N			75	11.9	29,839	3,371	84,284	74,357	110,146	109,595	179,048	110,354	207,710	206,672	8.9	6.8
303705559			50	8.0	19,893	2,248	56,189	49,571	73,430	73,063	169,102	73,570	138,473	137,781	8.9	6.8
			25	4.0	9,946	1,1234	28,095	24,786	36,715	36,532	159,155	36,785	70,361	68,891	8.9	6.8
Hgn Pk Eq Rm	319	1125	100	0.8	2,008	319	7,972	7,033	10,418	10,366	13,219	10,438	19,646	19,547	6.3	4.8
1120 7th St E			75	0.6	1,506	239	5,979	5,275	7,813	7,774	12,717	7,828	14,734	14,661	6.3	4.8
303820841			50	0.4	1,004	159	3,986	3,516	5,200	5,183	12,215	5,219	9,823	9,774	6.3	4.8
			25	0.2	502	80	1,993	1,758	2,604	2,591	11,713	2,609	4,991	4,887	6.3	4.8
W End Rnk	402	1929	100	1.4	3,445	402	10,054	8,870	13,139	13,074	16,882	13,164	24,778	24,654	8.6	6.6
601 Main St W			75	1.0	2,583	302	7,541	6,653	9,854	9,805	16,021	9,873	18,583	18,490	8.6	6.6
303825973			50	0.7	1,722	201	5,027	4,435	6,570	6,537	15,160	6,582	12,389	12,327	8.6	6.6
			25	0.3	861	101	2,514	2,218	3,285	3,268	14,299	3,291	6,295	6,163	8.6	6.6
Airport	288	880	100	0.6	1,571	288	7,210	6,3601	9,422	9,375	11,899	9,440	17,768	17,679	5.4	4.2
50511 State Hwy 112 Gate			75	0.5	1,179	216	5,407	4,771	7,067	7,031	11,506	7,080	13,326	13,260	5.4	4.2
303963830			50	0.3	786	144	3,605	3,180	4,711	4,688	11,113	4,720	8,884	8,840	5.4	4.2
			25	0.0	0	0	0	0	0	0	0	0	0	0	NA	NA
St Lt Svc	775	10404	100	7.4	18,579	775	19,383	17,100	24,677	24,553	34,925	25,378	46,535	46,302	24.0	18.9
825 Main St W			75	5.6	13,934	581	14,537	12,825	18,508	18,415	30,280	19,033	34,901	34,726	24.0	18.9
304178140			50	3.7	9,289	388	9,691	8,550	12,338	12,277	25,635	12,689	23,267	23,151	24.0	18.9
			25	1.9	4,645	194	4,846	4,275	6,169	6,138	20,991	6,344	11,822	11,576	24.0	18.9
Gen TOD Svc	17,150	178280	100	127.3	318,357	17,150	428,761	378,262	560,320	557,519	759,542	561,382	1,056,639	1,051,356	18.6	14.3
215 6th St E			75	95.5	238,768	12,863	321,571	283,696	420,240	418,139	679,952	421,037	792,479	788,517	18.6	14.3
304500475			50	63.7	159,179	8,575	214,381	189,131	280,160	278,759	600,363	280,691	528,320	525,678	18.6	14.3
			25	31.8	79,589	4,2878	107,190	94,565	140,080	139,380	520,774	140,346	268,447	262,839	18.6	14.3
Sm Gen Svc			100	0.0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
323 Stuntz Ave N			75	0.0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
304520171			50	0.0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
			25	0.0	0	0	0	0	0	0	0	0	0	0	N/A	N/A
Wstwtr Utility	77,279	921530	100	658.2	1,645,589	77,279	1,931,982	1,704,434	2,524,785	2,512,161	3,471,217	2,529,568	2,524,785	4,737,373	21.3	16.4
1901 Knight Rd			75	493.7	1,234,192	57,959	1,448,987	1,278,325	1,893,588	1,884,120	3,059,820	1,897,176	1,893,588	3,553,030	21.3	16.4
302154453			50	329.1	822,7945	38,640	965,991	852,217	1,262,392	1,256,080	2,648,423	1,264,784	1,262,392	2,368,687	21.3	16.4
			25	164.6	411,397	19,320	482,996	426,108	631,196	628,040	2,237,025	632,392	631,196	1,184,343	21.3	16.4

City Owned Solar Installation (2/16-3/18) *continued*

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Main Lftstn	47,207	261057.5	100	186.5	466,174	47,207	1,180,182	1,041,181	1,542,305	1,534,593	1,995,954	1,545,227	2,908,442	2,893,900	9.9	7.6
314 11th Ave E			75	139.9	349,631	35,405	885,137	780,886	1,156,729	1,150,945	1,879,410	1,158,920	2,181,332	2,170,425	9.9	7.6
302152769			50	93.2	233,087	23,604	590,091	520,590	771,152	767,297	1,762,866	772,614	1,454,221	1,446,950	9.9	7.6
			25	46.6	116,544	11,802	295,046	260,295	385,576	383,648	1,646,323	386,307	738,912	723,475	9.9	7.6
6th Ave Lftstn	4,080	33380	100	23.8	59,607	4,080	101,991	89,979	133,286	132,620	176,952	133,539	251,348	250,091	14.6	11.2
523 Lake Shore Dr			75	17.9	44,705	3,060	76,494	67,484	99,965	99,4645	162,051	100,154	188,511	187,568	14.6	11.2
302307545			50	11.9	29,804	2,040	50,996	44,989	66,643	66,310	147,149	66,769	125,674	125,045	14.6	11.2
			25	6.0	14,902	1,020	25,498	22,495	33,323	33,155	132,247	33,385	63,857	62,523	14.6	11.2
27th Ave Lftstn	750	4354	100	3.1	7,775	750	18,754	16,545	24,508	24,386	31,802	24,555	46,217	45,986	10.4	8.0
2614 Lake Shore Dr			75	2.3	5,831	563	14,066	12,400	18,381	18,289	29,858	18,416	34,663	34,480	10.4	8.0
303562018			50	1.6	3,888	375	9,377	8,273	12,254	12,193	27,915	12,277	23,109	22,993	10.4	8.0
			25	0.8	1,944	188	4,689	4,136	6,127	6,096	25,971	6,139	11,742	11,497	10.4	8.0
Trnr Rd Lftstn	1,111	7193	100	5.1	12,845	1,111	27,778	24,506	36,301	36,120	47,411	36,370	68,456	68,114	11.6	8.9
524 Turner Rd			75	3.9	9,633	833	20,834	18,380	27,226	27,090	44,200	27,278	51,342	51,085	11.6	8.9
303648977			50	2.6	6,422	556	13,889	12,253	18,151	18,060	40,989	18,185	34,228	34,057	11.6	8.9
			25	1.3	3,211	278	6,945	6,127	9,075	9,030	37,7778	9,093	17,392	17,028	11.6	8.9
TOTAL	233,066		100	1537.1	3,842,796	233,066	5,826,639	5,140,379	7,607,337	7,569,300	10,201,826	7,622,419	12,109,342	14,274,008	16.5	12.6
			75	1152.7	2,881,782	174,799	4,369,979	3,855,284	5,700,301	5,671,800	9,232,642	5,711,603	9,072,198	10,695,746	16.5	12.6
			50	768.3	1,920,776	116,533	2,913,3120	2,570,190	3,796,249	3,777,268	8,262,592	3,803,777	6,040,680	7,123,083	16.5	12.6
			25	383.6	959,093	58,266	1,456,660	1,285,095	1,890,799	1,881,345	7,268,999	1,894,545	3,045,080	3,547,796	16.5	12.6

Center for Rural Communities
NORTHLAND COLLEGE

The Northland College Center for Rural Communities applies research-based solutions to social and economic challenges, partners with community members to build on local knowledge, and promotes the long-term health and vitality of rural communities in the north woods region. For more information, visit us at:
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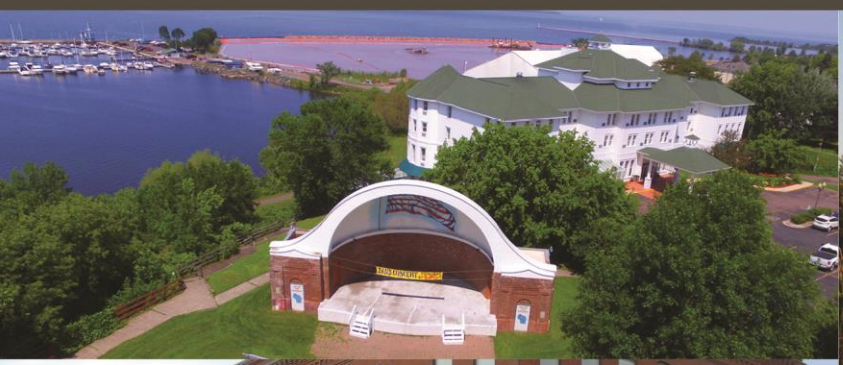
AN ENERGY ACTION PLAN FOR

ASHLAND

October 2021



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An Xcel Energy Community Collaboration

ACKNOWLEDGEMENTS

Thank you to the following individuals who contributed many hours of service to developing this Energy Action Plan. Additional thank you to the community members who participated in focus group conversations to help inform strategy development for how to engage different target audiences in the Ashland community.

The content of this plan is derived from a series of planning workshops hosted by Xcel Energy's Partners in Energy. Xcel Energy is the main electric and gas utility serving Ashland. Partners in Energy is a two-year collaboration to develop and implement a community's energy goals. For more information about the planning workshops, see *Appendix 3: Xcel Energy's Partners in Energy Planning Process*.

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This Energy Action Plan was funded by and developed in collaboration with Xcel Energy's Partners in Energy. Partners in Energy shall not be responsible for any content, analysis, or results if Ashland has made modifications to the plan.

TABLE OF CONTENTS

GLOSSARY OF TERMS

Behind the Meter Generation: Refers to energy production and storage systems that directly supply homes and buildings with electricity.

British Thermal Unit (BTU): The amount of heat needed to raise one pound of water at maximum density through one degree Fahrenheit

Carbon-free: Carbon-free refers to sources of energy that will not emit additional carbon dioxide into the air. Wind, solar, and nuclear energy are all carbon-free sources but only wind and solar are renewable.

Energy Burden: Percentage of gross household income spent on energy costs.

Greenhouse Gases (GHG): Gases in the atmosphere that absorb and emit radiation and significantly contribute to climate change. The primary greenhouse gases in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

Grid Decarbonization: The current planned reduction in the carbon intensity of electricity provided by electric utilities through the addition of low- or no-carbon energy sources to the electricity grid.

Kilowatt-hour (kWh): A unit of electricity consumption.

Million British Thermal Units (MMBtu): A unit of energy consumption that allows both electricity and natural gas consumption to be combined.

Metric Tons of Carbon Dioxide Equivalent (MTCO2e): A unit of measure for greenhouse gas emissions. The unit "CO2e" represents an amount of a greenhouse gas whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas.

Megawatt (MW): A unit of electric power equal to one million watts.

Premise: A unique combination of service address and meter. For residential customers, this is the equivalent of an individual house or dwelling unit in a multi-tenant building. For business customers, it is an individual business, or for a larger business, a separately metered portion of the business's load at that address.

Renewable Energy Credit (REC): For every megawatt-hour of clean, renewable electricity generation, a renewable energy credit (REC) is created. A REC embodies all the environmental attributes of the generation and can be tracked and traded separately from the underlying electricity. Also known as a Renewable Energy Certificate.

Solar Garden: Shared solar array with grid-connected subscribers who receive bill credits for their subscriptions.

Solar Photovoltaic (PV): Solar cells/panels that convert sunlight into electricity (convert light, or photons, into electricity, or voltage).

Subscription: An agreement to purchase a certain amount of something in regular intervals.

Therm (thm): A unit of natural gas consumption.

Trade Partner: Trade Partners, also known as Trade Allies or Business Trade Partners, are vendors and contractors who work with business and residential customers to service, install, and provide consulting services regarding the equipment associated with utility rebate programs. Their support for utility programs can range from providing equipment and assisting with rebate paperwork, to receiving rebates for equipment sold.

INTRODUCTION

The City of Ashland teamed up with Xcel Energy's Partners in Energy and a planning team representing Ashland to create an energy vision to reduce the impact of climate change, make homes and businesses more energy efficient, and protect our natural resources.

25 X 25 for Energy Independence

The City of Ashland updated their 25 X 25 Plan for Energy Independence in 2018, which identifies several strategies to achieve the City's goal to source 25% of its energy from renewable sources by 2025. Strategies include reducing energy consumption through energy efficiency upgrades like new insulation and HVAC system replacement, installing on-site photovoltaic solar systems, and subscribing to renewable energy programs.

Improving Energy Efficiency and Renewable Energy

The City of Ashland has implemented several energy efficiency strategies from the 25 X 25 plan, including HVAC system upgrades, new lighting in buildings and parking lots, and other improvements. In addition, the City has installed a 34-kW solar array on the new police station and subscribes to a community solar garden support renewable energy at the new fire station.

The City of Ashland has been recognized for its sustainability efforts with SolSmart Silver and Green Tier Legacy Community designations. The Ashland City Council adopted an Eco-Municipality Designation to serve as a model for other cities and encourage sustainable economic development in the community.

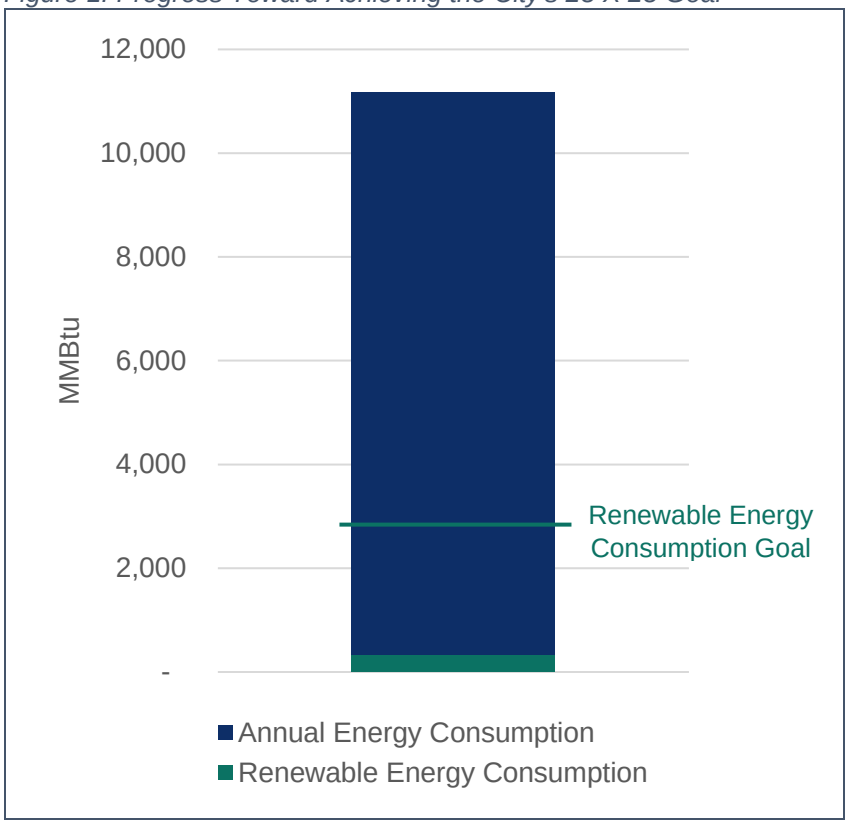
Progress Toward Goal

Term Definition: Behind the Meter
Generation: Refers to energy production and storage systems that directly supply homes and buildings with electricity.

Community energy data, including municipal energy consumption, was provided as part of the Partners in Energy process. The City of Ashland will need to consume approximately 2,800 MMBtu annually from renewable energy sources to meet its 25 X 25 goal. Reviewing grid energy consumption for municipal buildings, behind the meter generation, and renewable energy program participation, the City

consumes approximately 340 MMBtu of energy annually from renewable energy sources (*Figure 1*).[1] This represents 3.1% of its annual energy use. To achieve its goal, the City of Ashland will need to generate an additional 2,450 MMBtu from renewable sources by participating in programs where the City retains the Renewable Energy Credit and can make the claim toward powering their facilities with renewable energy.

Figure 1: Progress Toward Achieving the City's 25 X 25 Goal



Why an Energy Action Plan

Ashland's 25 X 25 plan is focused on City-owned buildings. Acknowledging that Ashland residents, businesses, and institutions should be part of this conversation, the City identified Xcel Energy's Partners in Energy as an opportunity to engage the Ashland community to increase energy efficiency and renewable energy across all sectors.

This plan creates intention, focuses efforts, and identifies actions to engage our community. This plan's scope encompasses all residents, businesses, nonprofits, and education institutions within the city of Ashland. Neighboring cities and the broader Ashland area may benefit from outreach to increase their understanding of the benefits of energy efficiency and renewable energy, but this outreach will not be the focus of our efforts.

[1] To measure progress toward Ashland's 25 X 25 goal, this plan estimates city facilities consume 11,180 MMBtu of energy annually and assumes a maximum annual production of 342 MMBtu from Ashland's on-site solar array and community solar garden subscription. Renewable energy consumption assumes the City of Ashland retains the REC for the on-site solar generation. Actual energy consumption and renewable energy production may vary.

WHERE WE ARE NOW

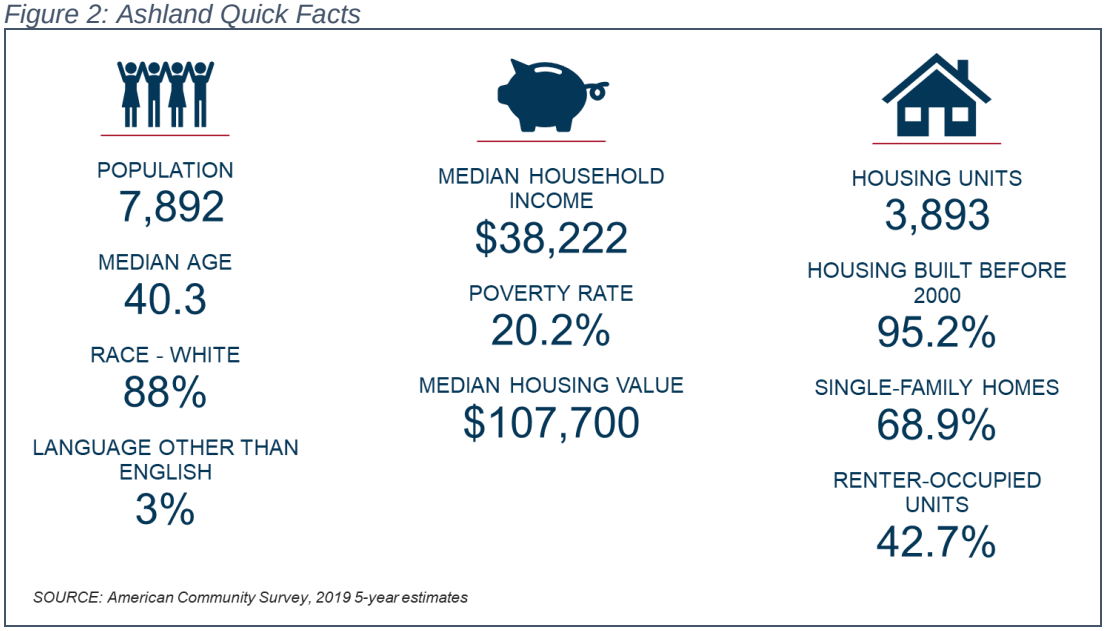
Reviewing community demographic and historic energy data is integral to the Partners in Energy planning process to ensure data-driven decisions for focus areas and strategies. See *Appendix 4: Baseline Energy Analysis* for a comprehensive overview of the baseline data.

Community Demographics

The team gathered information about Ashland's community makeup from the U.S. Census Bureau American Community Survey data, which highlighted the characteristics of Ashland's population and residences. Three key takeaways from the demographic data are as follows.

- Ashland is a small, older city compared to the state and peer cities.
- Ashland residents are low to moderate income and at least 20% of residents are in poverty.
- Most of Ashland's housing was built before 2000 and 43% of housing is rental.

Figure 2: Ashland Quick Facts



Population and Income

Ashland is a small, older community. According to the American Community Survey, Ashland has 7,892 residents and a median age of 40.3 (compared to the state's median age of 39.3). Median household income is just above $38,000 and 20% of Ashland residents are in poverty. Both data points are below the state's: the state's median household income is almost $62,000 and the state's poverty rate is 10.4%.

Housing Stock

There are approximately 3,893 housing units in Ashland, with 69% of units in single-family homes. Most of the housing stock is over 20 years old — 95% of units were built before 2000. There are also numerous rentals in the community; 43% of housing units are occupied by renters.

Energy Use and Savings

In addition to demographic data, the stakeholder team also reviewed data from Xcel Energy and Focus on Energy for all residents and businesses located in the City of Ashland. Xcel Energy provided data on energy use by sector and participation in renewable energy programs; Focus on Energy provided data on participation in energy efficiency programs. Key takeaways from the energy data include the following.

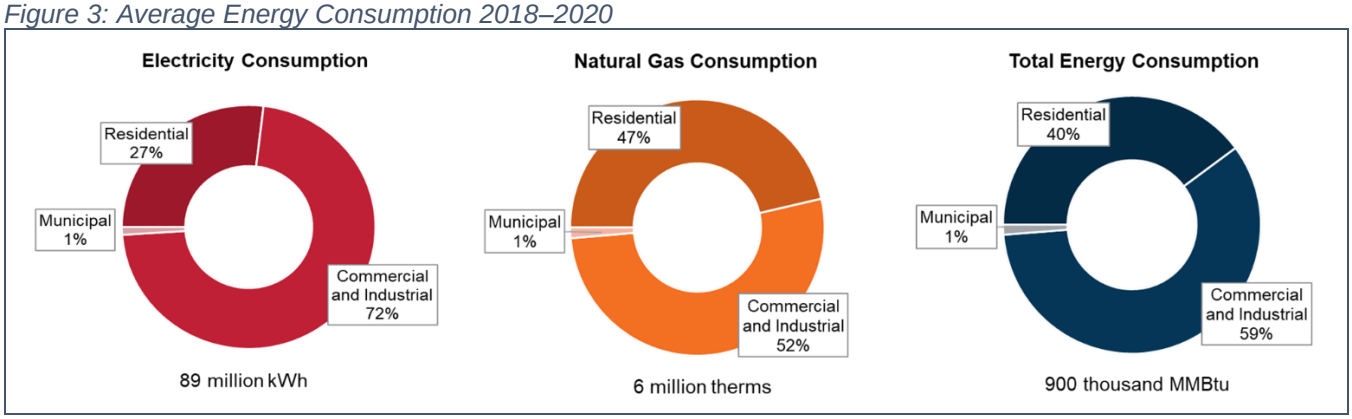
- Majority of energy users are residential.
- Commercial and industrial customers consumed more electricity and natural gas than other sectors.
- Ashland residents and businesses spend $13 million on energy in an average year.
- More residents participate in renewable energy than businesses.
- Ashland residents and businesses earned over $600,000 in utility incentives between 2018 and 2020.

Grid Energy Use

There are 4,516 premises in Ashland. Most premises are residential (3,660), followed by commercial and industrial (811), and municipal (37). In an average year, Ashland premises consume 89.3 million kWh of electricity and 6 million therms of natural gas, spending more than $13 million on energy bills in all sectors. Commercial and industrial premises, which represent 18% of total premises, consumed 72% of electricity and 52% of natural gas.

Term Definition: Premise
A premise is a unique combination of service address and meter. For residential customers, this is the equivalent of an individual house or dwelling unit in a multi-tenant building. For business customers, it is an individual business, or for a larger business, a separately metered portion of the business's load at that address.

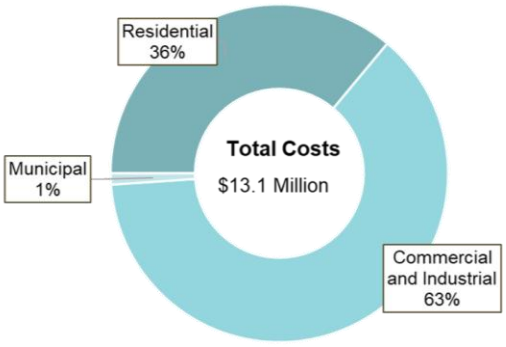
Figure 3: Average Energy Consumption 2018–2020



Energy Costs and Energy Burden

The average residential premise in Ashland spends $1,300 a year on energy. Commercial and industrial premises' energy costs vary with the size of the business (e.g., a retail store versus a large industrial facility) but on average spend $10,000 per premise.

Figure 4: Average Energy Costs 2018–2020

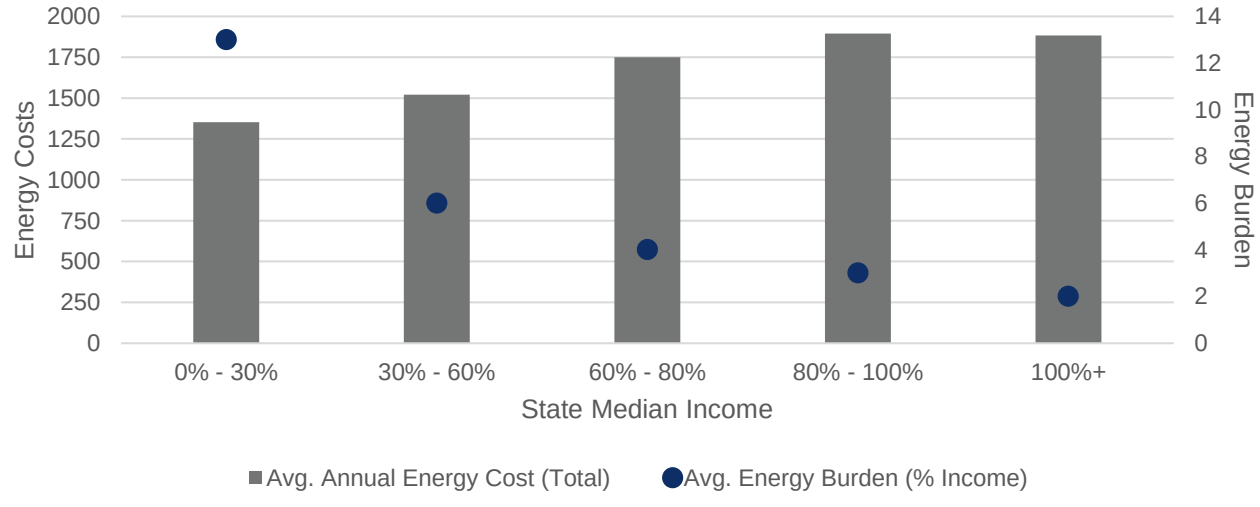


Sector	Electricty Costs	Natural Gas Costs	Costs per Premise
Residential	$2.7 million	$2.0 million	$1,300
Commercial & Industrial	$6.4 million	$1.8 million	$10,000
Municipal	$92,000	$50,000	$3,800

Term Definition: Energy Burden
Percentage of gross household income spent on energy costs. The Home Energy Affordability Gap Analysis defines households with a 6% energy burden or higher to experience a high burden.

As a low to moderate income community, a high percentage of Ashland residents' income goes to energy costs. *Figure 5* shows average annual energy costs and energy burden across different income brackets. Households at 100% state median income (SMI) spend the most each year on average, but only experience an energy burden of 2%. For different income brackets, energy burden increases as overall dollars spent decreases. The lowest income households, at 30% SMI, spend the least amount of money on energy but experience the highest energy burden at 13%.

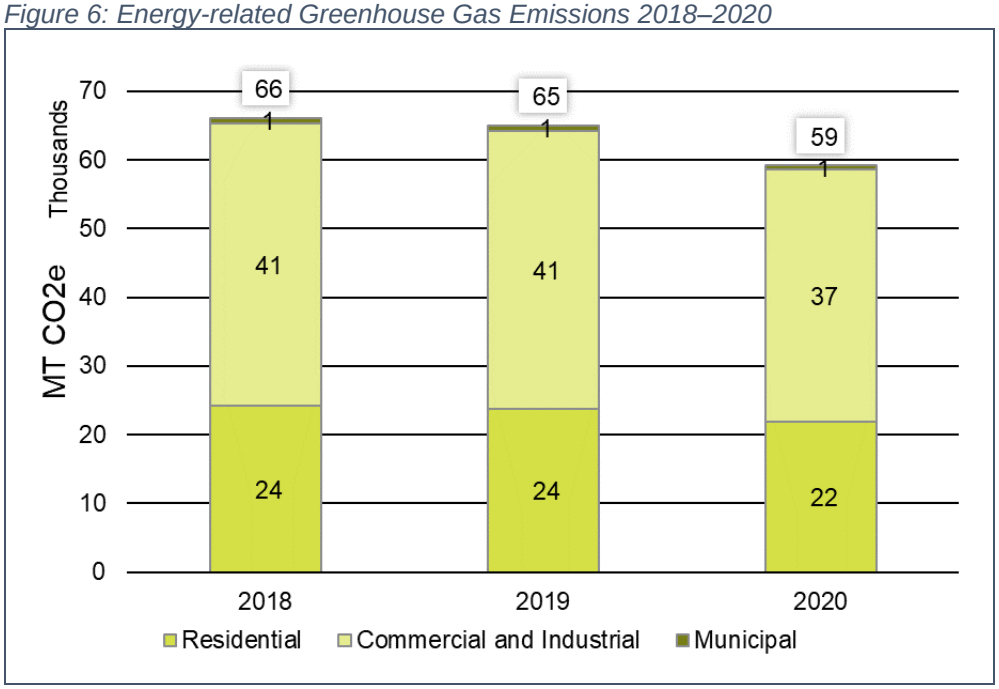
Figure 5: Ashland Annual Energy Costs and Energy Burden



Greenhouse Gas Emissions

In an average year, Ashland's grid energy use results in approximately 63,400 metric tons of carbon dioxide equivalent greenhouse gas emissions (MTCO2e). This is equivalent to the greenhouse gas emissions from 13,795 passenger vehicles driven for one year.[2] Commercial and industrial premises account for the largest percentage of emissions, representing 63% of total energy-related greenhouse gas emissions in 2019.

Figure 6: Energy-related Greenhouse Gas Emissions 2018–2020



In an average year, greenhouse gas emissions by fuel source (electricity and natural gas) are about equal in Ashland (*Figure 7*). To achieve its goal of providing all customers with carbon-free electricity by 2050, Xcel Energy is decarbonizing its electricity generation by adding more solar and wind energy. Carbon-free sources added to the grid will reduce the proportion of greenhouse gas emissions from grid electricity use.[3]

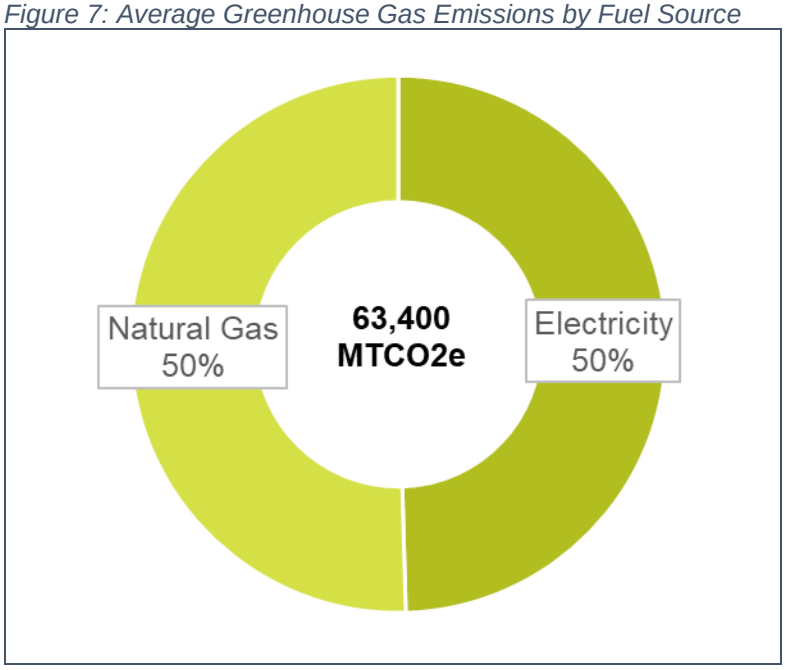
Term Definition: Grid Decarbonization

The current planned reduction in the carbon intensity of electricity provided by electric utilities through the addition of low- or no-carbon energy sources to the electricity grid.

Xcel Energy is the first major U.S. electricity provider with a vision to serve customers with 100% carbon-free electricity by 2050, with an interim goal to reduce carbon emissions 80% by 2030 from company-wide 2005 levels. Read more about Xcel Energy's carbon-free vision on their website.

[2] U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.
[3] Xcel Energy's Upper Midwest Energy Plan. https://www.xcelenergy.com/company/rates_and_regulations/resource_plan_overview/upper_midwest_energy_plan.

Figure 7: Average Greenhouse Gas Emissions by Fuel Source



Renewable Energy

Local renewable energy use is a result of both customer subscription programs and on-site installations with a majority of renewable energy generation coming from subscription programs. In 2019, 307 residential premises and 10 commercial and industrial premises subscribed to a renewable energy program. On-site solar installations were less popular; Focus on Energy only paid eight incentives for photovoltaic systems from 2018 to 2020.

Table 1: Renewable Energy Participation 2019

Xcel Energy Subscription Programs	Residential	Commercial & Industrial
Subscriber Count	298	4
Total Annual Electricity Subscribed (kWh)	333,462	31,053
Community Solar Gardens		
Subscriber Count	9	6
Total Annual Electricity Subscribed (kWh)	26,651	477,733
On-site Solar Installations		
Focus on Energy Incentives Paid[4]	7	1

Energy Efficiency Program Participation and Savings

Xcel Energy and Focus on Energy offer programs to Ashland residents and businesses to increase energy savings at their homes or buildings. Rebates for new equipment, audit programs, and discounted and no-cost energy measures are available in addition to load management programs. From 2018 to 2020, more than 5,500 Ashland residents and businesses participated in Focus on

[4] Data from Focus on Energy participation summaries 2018–2020.

Energy programs, resulting in $530,000 in incentives from Focus on Energy. The average incentive paid to program participants is $29 per resident and $258 per business. In addition to the incentives paid by Focus on Energy, Xcel Energy also offers bonus incentives for certain Focus on Energy rebates and programs. Almost $80,000 in bonus incentives were paid in Ashland over the baseline period.

Table 2: Program Participation Summary by Sector 2017–2019

	Residential Programs	Business Programs
Total Focus on Energy Program Participation	3,978	1,606
Total Focus on Energy Electricity Savings (kWh)	412,498	4,764,858
Total Focus on Energy Natural Gas Savings (therms)	25,526	103,449
Total Focus on Energy Incentives Paid	$114,900	$415,097
Total Xcel Energy Bonus Incentives Paid	$21,440	$57,916
Average Focus on Energy Participation	1,326	535
Average Focus on Energy Incentive per Participant	$29	$258

ACHIEVING OUR ENERGY VISION

This section outlines the focus areas, target audiences, goals, and strategies for achieving Ashland's energy vision to reduce the impacts of climate change, make homes and businesses more energy efficient, and protect our natural resources.

Focus Areas

- Energy efficiency through equipment upgrades and behavior changes
- Renewable energy support, including both on-site installation and off-site subscriptions
- Electric vehicle education to promote local charging stations and educate community about EV options

Target Audiences

The strategies and tactics outlined in this plan will benefit all in Ashland, including government organizations like the City of Ashland, homeowners and renters, rental property managers, businesses, nonprofit organizations, and education institutions. In addition, contractors and trade partners will benefit from increased engagement in Focus on Energy and Xcel Energy programs via equipment upgrades and building improvements.

To inform strategy development, the Energy Action Team identified perceived and actual barriers to increasing energy efficiency and participating in a renewable energy program. The team also explored these actions' benefits to identify what might motivate a target audience to overcome a barrier.

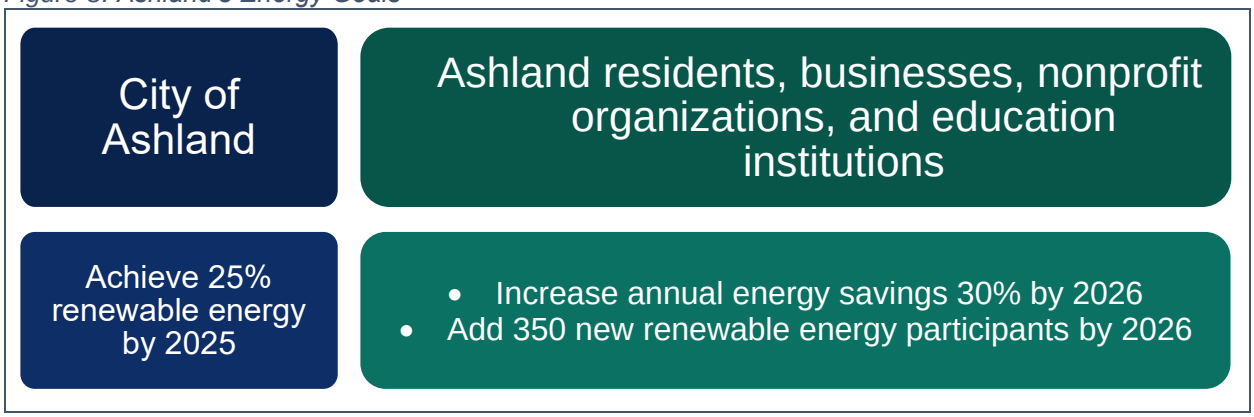
Table 3: Barriers and Benefits by Target Audience

	Barriers	Benefits
Homeowners & Renters	• Lack of knowledge and awareness about programs and how to access • Upfront capital costs for improvements too high • Split incentive with property manager when you rent a property • Inability to make capital improvements to rental property • Reluctance to upgrade with rapidly changing technology • Lack of trust that information is current and accurate • Learning curve for using new technology • Difficulty prioritizing energy efficiency and renewable energy among other projects • Limited contractors to complete work • Older housing stock typically require more than just one upgrade • Tight rental market	• Cost savings and payback periods when you upgrade to new technology and equipment • Energy savings from more efficient energy use • Pride in being green and being sustainable • Reduced carbon footprint through cleaner energy use • Tourism opportunities to attract new visitors and continue to be a destination • Growing sense of environmental stewardship • Improvements and upgrades add value to homes
Rental Property Owners and Managers	• Lack of knowledge and awareness about programs and how to access them • Upfront capital costs make return on investment too difficult • Split incentive with renters who pay their own utility bills • Improvements don't necessarily increase rent revenue • Tenants won't see the value of improvements and increased rents • Tight rental market • Difficult to find time to replace equipment unless it fails or is on schedule for replacement • Difficult to prioritize energy efficiency and renewable energy with other projects • Landlords will do work themselves and won't qualify for rebates	• Energy savings with more efficient energy use • Growing sense of environmental stewardship • Pride in being green and being sustainable • Reduced carbon footprint through cleaner energy use • Improvements and upgrades add value to properties • Being green and sustainable carries PR benefits that attract new tenants
Businesses, Nonprofit Organizations, and Education Institutions	• Lack of knowledge and awareness about programs and how to access • Upfront capital costs make return on investment too difficult • Split incentive with property tenants who pay their own utility bills • Difficult to find time to replace equipment unless it fails or is on schedule for replacement • Difficulty prioritizing energy efficiency and renewable energy with other projects • Unreliable funding sources for small nonprofits	• Energy savings from more efficient energy use • Growing sense of environmental stewardship • Pride in being green and being sustainable • Reduced carbon footprint through cleaner energy use • Improvements and upgrades add value to properties • PR benefits of being green and sustainable • Upgrades preserve buildings and retain community charm and aesthetic

Goals

Building off the City of Ashland's initial goal to achieve 25% renewable energy by 2025, the following goals were created to target energy efficiency and renewable energy for private buildings.

Figure 8: Ashland's Energy Goals



Strategies

Near-term Strategies: 2022–2025

The Energy Action Team identified near-term strategies to increase energy efficiency and renewable energy participation in Ashland. Our recipe for success includes championing the City of Ashland, businesses, institutions, and residents to lead by example and demonstrate best practices, providing education and awareness about the benefits of energy efficiency and renewable energy, and using community connections to increase engagement across all Ashland sectors.

Outreach and Education

- Promote energy efficiency, renewable energy and electric vehicle programs, resources, and behavior changes.
- Engage large industry and education institution leadership to champion energy action plan and lead by example.
- Connect renters and homeowners to free and low-cost energy assistance programs.
- Connect businesses to free energy assessments.

Process and Policy Updates

- Update development review and permitting process with energy efficiency and renewable energy program information.
- Benchmark City-owned building energy consumption and share data with community in public dashboard.
- Prioritize sustainability standards in new construction and renovation of City-owned buildings.
- Advocate State energy initiatives as recommended by the 2020 Climate Change Task Force Report.
- Maintain SolSmart Silver designation and pursue additional recommended process changes to reduce on-site solar barriers and achieve Gold designation.

Capital Investment and Financing

- Create energy audit and recommissioning schedule for city-owned buildings.

- Update existing loans and grants to include energy efficiency and renewable energy improvements as eligible costs.

Medium-Term Strategies: 2026–2030

Several medium-term strategies were identified. These are beyond our goals' timeline but important to continue engaging our community and mitigate the impacts of climate change. If additional human and financial resources are identified, these strategies could be implemented earlier.

Outreach and Education

- Create a sustainability navigator program to support renters and rental property owners.

Process and Policy Updates

- Adopt an energy benchmarking ordinance for private-owned buildings.
- Update purchasing policy to prioritize energy efficient equipment in replacement schedules.
- Create a sustainable building policy to require sustainability standards in new construction and redevelopment projects.
- Advocate new policies to allow master metering.
- Complete fleet analysis for City-owned fleet vehicles and transition vehicles based on recommendations.

Capital Investment and Financing

- Complete solar suitability analysis on City-owned buildings to power them with renewable electricity.
- Create incentive programs, like bonus rebates or group buy, for residents, property owners, and businesses who increase their building's energy efficiency or support renewable energy.
- Fund demonstration projects for innovative energy efficiency and renewable energy projects.

Long-term Strategies: 2030 and Beyond

In addition to medium-term strategies, two long-term strategies were identified to achieve Ashland's energy priorities but are best suited for long-term implementation because of limited financial and human resources.

- Create clean energy training programs and career paths.
- Invest in community resilient energy systems, such as back-up generation and microgrids.

Energy Action Plan Impact

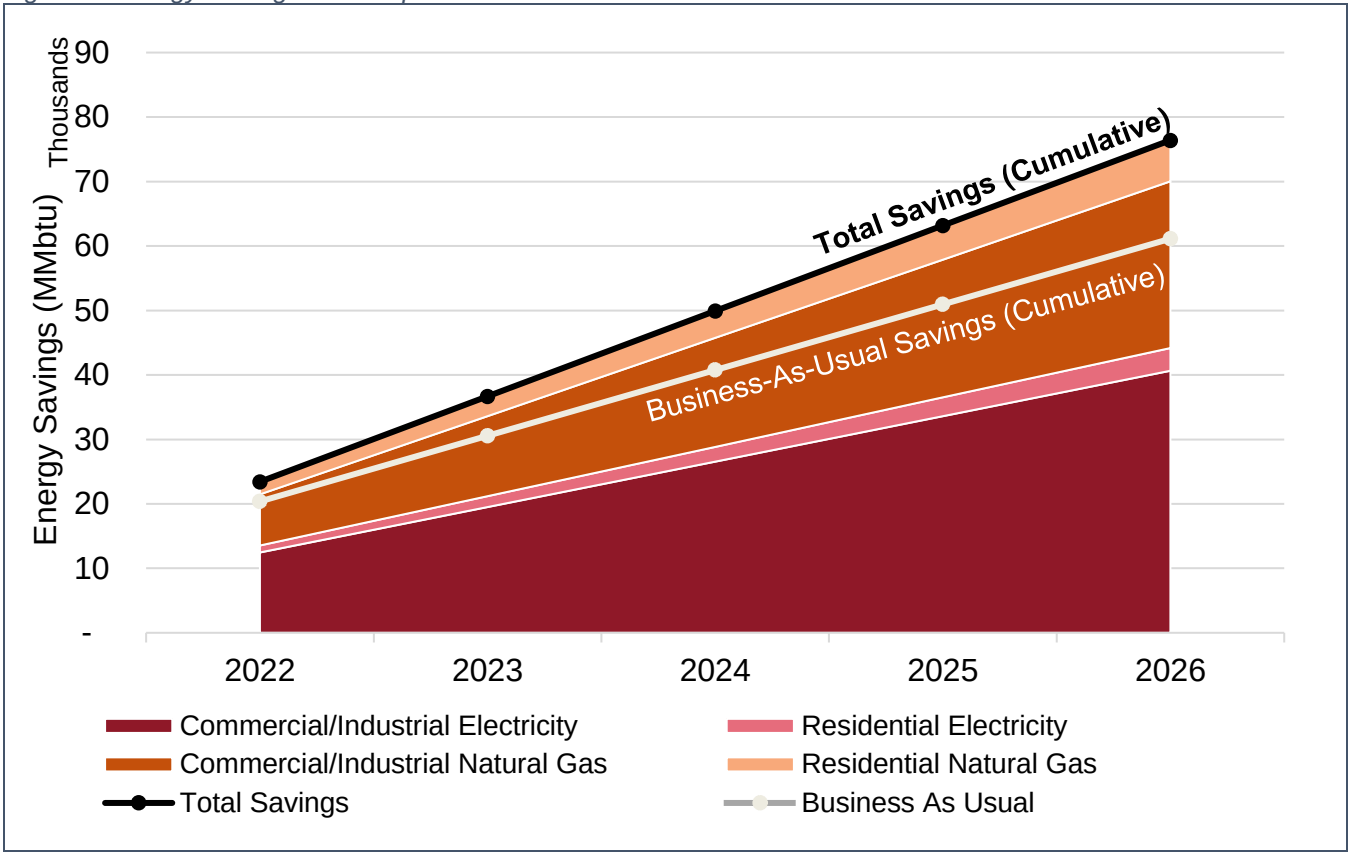
Successfully implementing this plan's strategies will allow Ashland to increase cumulative energy savings 30% by 2026 and add 350 new renewable energy participants.

Increased Energy Efficiency

In a business-as-usual scenario, where there is no additional support or collaboration with the Ashland community or energy utilities, Ashland premises will cumulatively save 8.6 million kWh of electricity and 215,000 therms by 2026 through Focus on Energy's energy efficiency programs. Increasing cumulative energy savings by 2026 will result in residential premises saving 894,000 kWh and 55,300 therms and commercial and industrial premises saving 10.3 million kWh and 224,100 therms. *Figure 9* illustrates each sector's potential contribution. Commercial and industrial electricity savings would contribute the most toward the energy savings goal.

The cumulative impact of these energy savings will save Ashland almost $1.17 million in energy costs, which can be used to invest in Ashland homes and buildings and to spend at local businesses.

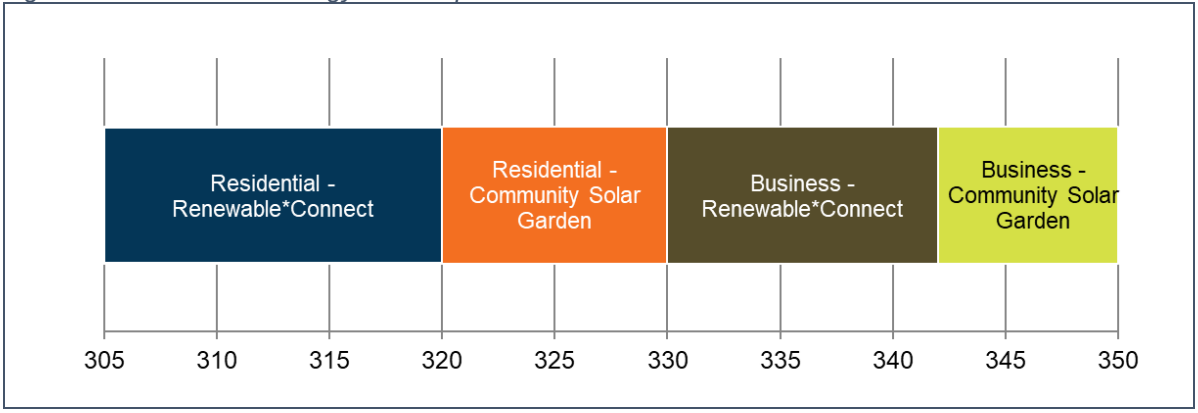
Figure 9: Energy Savings Goal Impact 2026



Renewable Energy Support

By focusing resources to promote renewable energy programs and add 350 new renewable energy participants, Ashland's total renewable energy support will increase to 667 participants and more than 2.27 million kWh of electricity will be generated from renewable sources by 2026. Assuming business-as-usual participation, most new renewable energy supporters will be subscribed to Xcel Energy's Renewable*Connect program, which allows premises to subscribe some or all their electricity from 100% clean energy.

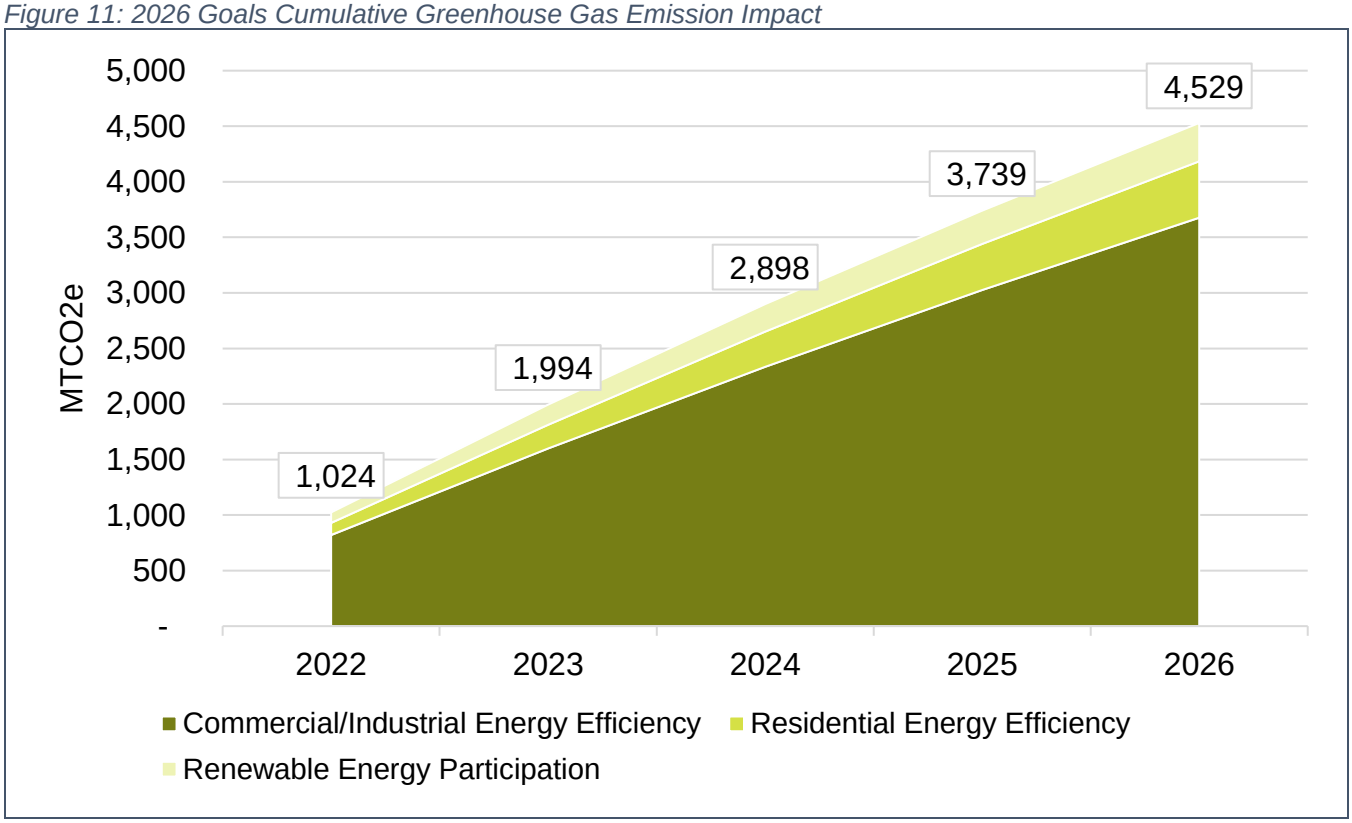
Figure 10: Renewable Energy Goal Impact 2026



Greenhouse Gas Impact

Increases in energy savings and renewable energy participation will also benefit the environment by reducing energy-related greenhouse gas emissions. Improved energy efficiency in the commercial and industrial sector will contribute most to greenhouse gas reductions—a 30% increase in energy savings will avoid an estimated 4,200 MTCO2e. Renewable energy strategies will generate more electricity from carbon-free sources, and adding 350 new renewable energy subscribers will avoid an estimated 345 MTCO2e. Energy efficiency and renewable energy's combined greenhouse gas impact is equivalent to removing 985 passenger vehicles from the road for a year.[5]

Figure 11: 2026 Goals Cumulative Greenhouse Gas Emission Impact



[5] U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator. https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

HOW WE STAY ON COURSE

This Energy Action Plan is a living document. Goals and strategies will be assessed and refined as needed based on progress toward goals and community and staff capacity.

Implementing the strategies outlined in this plan will require leadership and collaboration among the City of Ashland, members of Energy Action Team, community representatives, Focus on Energy, and Xcel Energy.

Implementation Support from Partners in Energy

Xcel Energy's Partners in Energy commits to 18 months of implementation support, including marketing and communications support and program expertise. It will also provide a dedicated community facilitator to serve as a primary point of contact. Partners in Energy digital resources, including office hours, community portal, and community events will also be available to the Ashland team.

Xcel Energy will also leverage its communication channels promote programs and resources as well as leverage staff expertise to connect the City of Ashland and Ashland Xcel Energy customers with the right resources.

Figure 12: Actions and Tracking

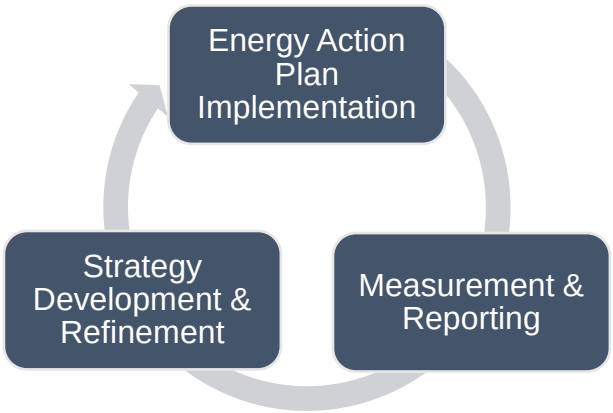


Figure 13: Partners in Energy Implementation Resources

Data and Reporting

We will provide biannual progress reports with success metrics and the overall progress toward Xcel Energy and Focus on Energy's goals during the first phase of implementation. These reports will include program participation, energy savings by sector, and energy consumption by sector. If available, ad-hoc participation reports for specific programs will be provided to measure success of campaigns and determine whether we need to change course.

Project Management and Tracking

Partners in Energy will host regular project management check-in calls with City staff to ensure that we stay on course to achieve our strategies for the first 18 months of implementation. In addition, Partners in Energy facilitators will support the Energy Action Team and community connectors with one-on-one outreach to facilitate strategy implementation.

At the implementation midpoint, we will convene the Energy Action Team to assess progress toward goals and discuss strategy refinement as needed.

Implementation Support from the City of Ashland

The City of Ashland will provide a primary point of contact for implementation and will assign members to attend regular project management check-ins. The City commits to leveraging existing communication channels and community connections for outreach and engagement strategies. In addition, the City of Ashland will lead strategies specific to City-owned buildings and policies.

Implementation Support from the Community and Energy Action Team

The Energy Action Team formed to create this plan will support implementation by serving as community connectors to their networks and will promote our energy vision, encourage participation in programs and outreach campaigns, and share success stories. When available, the Energy Action Team will serve as partners and leaders in strategies, including those that target small and medium-sized businesses, large industry, and education institutions.

Communication Channels

Several communication channels were identified by the Energy Action Team.

- City of Ashland website and social media
- Community events
- Local TV news
- Ashland Daily Press
- Visit Ashland
- Neighborhood groups and social media
- Word of mouth
- Social media groups on Facebook
- Direct contact with trade partners
- Chamber newsletter
- Xcel Energy MyAccount and bill inserts
- Water utility bill inserts
- Education institution networks and channels
- Community boards/kiosks at gathering places
- Nonprofit and civic organization mailing lists
- Local radio station

Community Connectors

Community connectors — individuals and organizations who will champion the Energy Action Plan — are an important resource for implementation success. A community connector uses their network of contacts to share and champion calls to action and advocate the Energy Action Plan strategies. Community connectors include those represented on the Energy Action Team and other community members.

APPENDIX 1: NEAR-TERM STRATEGY WORK PLAN

This appendix summarizes near-term strategies, implementation team, and timeline.

			Implementation Support from Partners in Energy										
			2021	2022				2023				2024	2025
Strategy	**Implementation Lead**	**Implementation Support**	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
Promote energy efficiency, renewable energy and electric vehicle programs, resources, and behavior changes.	City Staff Partners in Energy	Energy Action Team Xcel Energy Focus on Energy	x	x	x	x	x	x	x	x	x	x	x
Engage large industry and education institution leadership to champion energy action plan and lead by example.	Large Industry Education Institutions	City Staff Partners in Enery Focus on Energy		x	x	x		x	x	x		x	x
Connect residents to free and low-cost energy assistance programs.	City Staff Partners in Enery Focus on Energy	Service Providers	x			x	x			x	x	x	x
Connect businesses with free energy assessments.	Xcel Energy	City Staff Partners in Enery Focus on Energy		x	x	x		x	x	x		x	x
Update development review and permitting process with energy efficiency and renewable energy program information.	City Staff	Xcel Energy Focus on Energy Partners in Energy		x	x								
Benchmark city-owned building energy consumption and share data in public dashboard for community.	City Staff	Xcel Energy		x				x				x	x
Prioritize sustainability standards in new construction and renovation of city-owned buildings	City Staff	Xcel Energy Focus on Energy	x	x			x	x			x	x	x
Advocate for State energy initiatives as recommended by the 2020 Climate Change Task Force Report.	City Council	City Staff		x				x				x	x
Maintain SolSmart Silver designation and pursue additional recommended process changes to reduce the barriers to on-site solar to achieve Gold designation.	City Staff	Xcel Energy			x	x	x						
Create energy audit and recommissioning schedule for city-owned buildings.	City Staff	Xcel Energy Focus on Energy	x	x									
Update existing loans and grants to include energy efficiency and renewable energy improvements as eligible costs.	City Staff	Sustainability Committee Xcel Energy Focus on Energy				x	x	x	x				

APPENDIX 2: METHODOLOGY FOR MEASURING SUCCESS

As part of implementation support, Partners in Energy will provide biannual progress reports from Xcel Energy for energy consumption, program participation, and savings data during the first phase of implementation. All goals will be measured against Ashland's three-year baseline of 2018–2020 unless otherwise noted.

Energy Savings Goal

- Increase annual energy savings 30% above business as usual by 2026.

This goal assumes a business-as-usual (BAU) savings scenario based on the three-year baseline. The energy savings goal will be measured by comparing cumulative electricity and natural gas savings over the five years between 2022 and 2026 for all sectors against projected BAU savings over the same time period. This goal includes all Focus on Energy programs available to every sector and measures the first-year savings data provided by Focus on Energy.

Table 4: 2021–2026 Cumulative Energy Savings by Scenario

	2026 Cumulative BAU Scenario	2026 Cumulative Goal Scenario
kWh savings	8,628,925	11,217,603
Therm savings	214,960	279,448
MMBtu savings	50,938	66,219

In order to achieve Ashland's 2026 goal, the community will need to save 30% more electricity and natural gas annually than the BAU scenario. The chart below outlines the annual savings needed to meet both the 2026 goal scenario and the BAU scenario.

Table 5: 2021–2026 Average Annual Energy Savings Targets

	Annual Targets BAU Scenario	Annual Targets 2026 Goal Scenario
kWh savings	1,725,785	2,243,521
Therm savings	42,992	55,890
MMBtu savings	10,188	13,244

To estimate dollar savings impacts, the following rates were used for electricity and gas. These are based on average rates for residential and commercial and industrial customers in the area.

Table 6: Cost Savings Assumptions by Sector and Fuel Source

	Residential	Commercial and Industrial
Electricity, dollars per kWh	$0.113	$0.087
Natural Gas, dollars per therm	$0.72	$0.589

To estimate the greenhouse gas emissions impact, projected emission factors will be applied to the electricity and natural gas savings. For the purposes of this Energy Action Plan, all projected greenhouse gas emission assumptions are based on Xcel Energy's 2019 Carbon Emissions

Reporting.[6] Greenhouse gas emissions avoided will be calculated during implementation using Xcel Energy's latest carbon emissions reporting.

Renewable Energy Participation Goal

- Add 350 renewable energy program participants by 2026.

This goal will be measured by comparing actual renewable energy program participation against 2019 participation numbers. All renewable energy programs available from Xcel Energy and Focus on Energy are included, with a focus on Renewable*Connect, Solar*Connect Community, and on-site solar installations. As of 2021, Windsource is no longer available to Wisconsin customers. As new subscription and on-site renewable energy programs become available, they will be included to measure progress toward the 2026 goal.

Table 7: Renewable Energy Goal versus 2019 Baseline

	2019 Baseline	2026 Goal Scenario
Participation Totals	317	667

Table 8: Baseline Participation Data 2019

	Residential	Commercial and Industrial
Xcel Energy Windsource	146	2
Xcel Energy Renewable*Connect	152	2
Xcel Energy Solar*Connect Community	9	6

[6] Energy and Carbon Emissions Reporting 2019 Summary by Xcel Energy. https://www.xcelenergy.com/staticfiles/xe-responsive/Environment/Carbon/Xcel-Energy-Carbon-Dioxide-Emission-Intensities.pdf.

APPENDIX 3: XCEL ENERGY'S PARTNERS IN ENERGY PLANNING PROCESS

About Xcel Energy's Partners in Energy

Xcel Energy is an electric and natural gas utility that provides the energy that powers millions of homes and businesses across eight western and midwestern states. Each community Xcel Energy serves has its own unique priorities and vision for its energy future. The energy landscape is dynamically changing and communities lead the way in setting energy and sustainability goals. To continue to innovatively support their communities, Xcel Energy launched Partners in Energy in the summer of 2014 as a collaborative resource with tailored services to complement each community's vision. The program offers support to develop an energy action plan or electric vehicle plan, tools to help implement the plan and deliver results, and resources designed to help each community stay informed and achieve their outlined goals.

Partners in Energy Process for Success

Plan Development Process

The plan's content is derived from a series of planning workshops hosted online with a team committed to representing Ashland's energy priorities. The City of Ashland actively recruited stakeholders to participate in this process.

Figure 14: Ashland's Energy Action Plan Development Process

January–April 2021: Kick-off and Planning		
Kick-off Meeting	Community Stakeholder Recruitment	Energy and Demographic Data Analysis

May–July 2021: Stakeholder Engagement and Strategy Development		
Workshops 1 & 2	Sustainability Commission Presentations	Focus Group Conversations

August–October 2021: Plan Finalization		
Draft Energy Action Plan	Sustainability Commission Endorsment	City Council Approval

APPENDIX 4: BASELINE ENERGY ANALYSIS

This appendix includes data from many sources to establish a community baseline to compare progress toward goals in the future.

Demographic Baseline

Demographic data was sourced from the U.S. Census Bureau 2018 American Community Survey's five-year estimates. Two databases — DP04 Housing Characteristics and DP05 Population Characteristics — were the primary sources for the demographic baseline.

Housing Characteristics

There are approximately 3,893 housing units in Ashland and 69% of units are in single-family homes. Most of the housing stock is over 20 years old — 95% of units were built before 2000. There are also several rentals in the community and renters occupy 43% of housing units.

Table 9: Units in Structure

Total housing units	3,893
1-unit, detached	2,641
1-unit, attached	42
2 units	293
3 or 4 units	236
5 to 9 units	119
10 to 19 units	123
20 or more units	299
Mobile home	140
Boat, RV, van, etc.	0

Table 10: Housing Unit Age

Total housing units	3,893
Built 2014 or later	18
Built 2010 to 2013	62
Built 2000 to 2009	107
Built 1990 to 1999	225
Built 1980 to 1989	229
Built 1970 to 1979	559
Built 1960 to 1969	247
Built 1950 to 1959	431
Built 1940 to 1949	324
Built 1939 or earlier	1,691

Table 11: Housing Tenure

Occupied housing units	3,466
Owner occupied	1,986
Renter occupied	1,480

Population Characteristics

Ashland is a small, older community. According to the American Community Survey, Ashland has 7,892 residents and a median age of 40.3 (compared to the statewide median age of 39.3). The population is 88% white and 3% speak a language other than English.

Table 12: Race

Total Population	7,892
White alone	6,946
Black or African American alone	93
American Indian and Alaska Native alone	480
Asian alone	49
Native Hawaiian and other Pacific Islander alone	6
Some other race alone	38
Two or more races	280

Table 13: Age

Total Population	7,892
5 to 14 years	865
15 to 17 years	290
Under 18 years	1,542
18 to 24 years	1,041
15 to 44 years	3,195
16 years and over	6,546
18 years and over	6,350
21 years and over	5,903
60 years and over	1,961
62 years and over	1,710
65 years and over	1,391
75 years and over	670

Table 14: Speak a Language Other Than English

Population 5 years and over	7,505
Speak only English	7,301
Speak a language other than English	204

Energy Baseline

All energy data was provided by Xcel Energy and Focus on Energy as part of Ashland's participation in Xcel Energy's Partners in Energy.

Xcel Energy, Ashland's electric and natural gas service provider, provided 2018–2020 consumption and program participation data for all customers in Menomonie. Focus on Energy, the statewide provider of energy efficiency programs in Wisconsin, provided 2018–2020 program participation, energy savings, and incentives data.

Electricity and Natural Gas Premises

In 2020, there were 4,516 total premises in Ashland. Most premises in Ashland are residential. Approximately 81% of premises are residential, while 18% are commercial and industrial. The remaining 1% in the community are municipal and owned by the City of Ashland.

Electricity and Natural Gas Consumption and Trends by Sector

While most Ashland premises are residential, they do not use as much energy as commercial and industrial premises. Commercial and industrial customers represent 18% of premises in Ashland and consume about 72% of total electricity and 52% of total natural gas in the community. By comparison, residents consume 27% of electricity and 47% of natural gas.

Over the baseline period of 2018–2020, electricity consumption remained relatively stable, but there was an increase in cooling degree days in 2020 compared to 2018. Natural gas use was more impacted by weather trends, including a decrease of heating degree days when the use of natural gas decreased in both the residential and the commercial and industrial sector.

Figure 15: Electricity Consumption by Sector 2018–2020

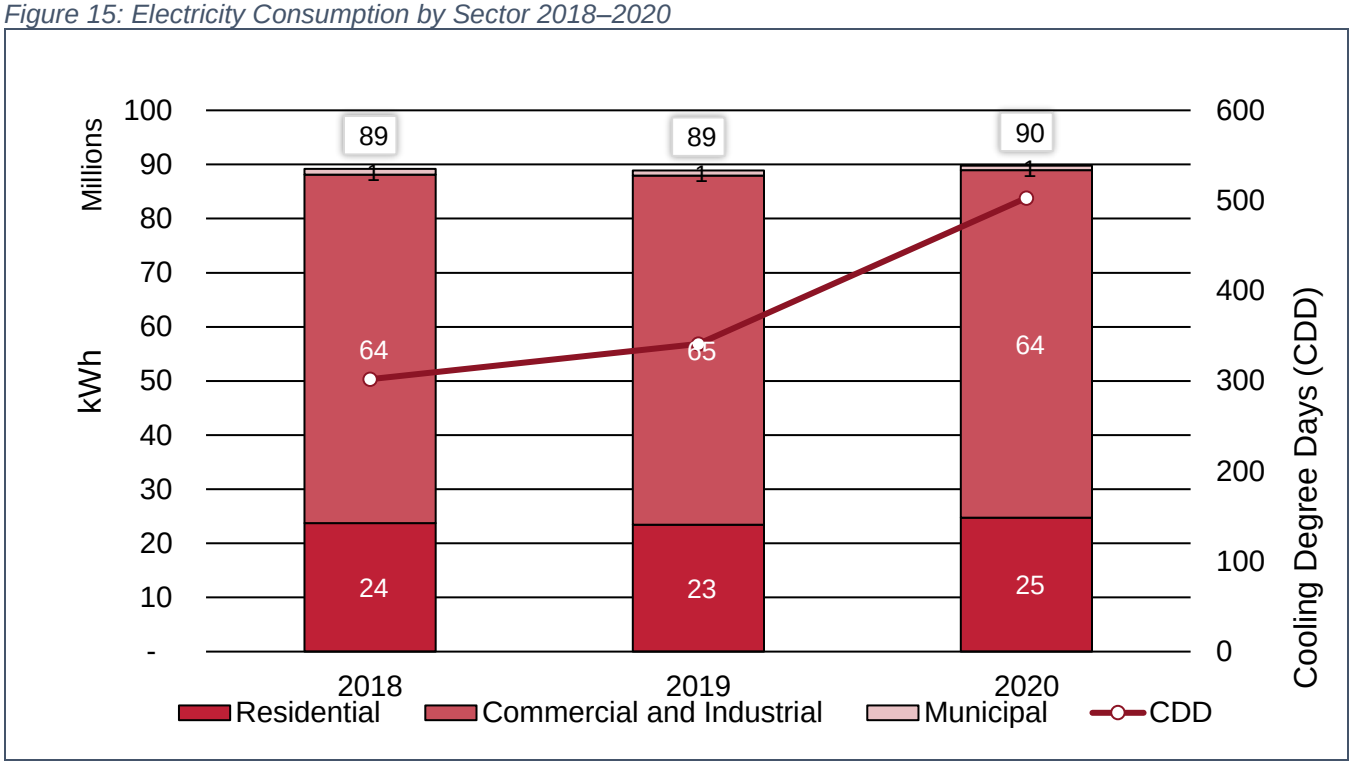
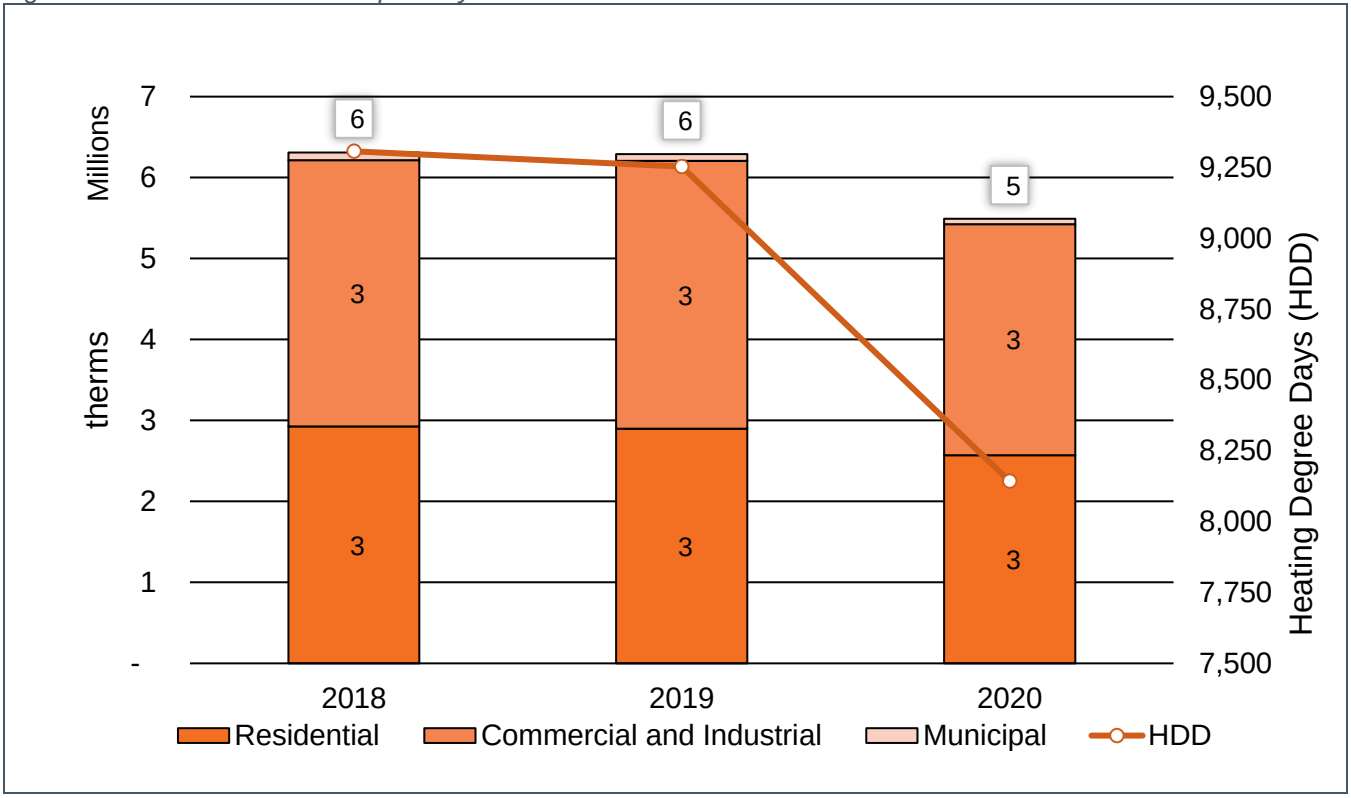


Figure 16: Natural Gas Consumption by Sector 2018–2020



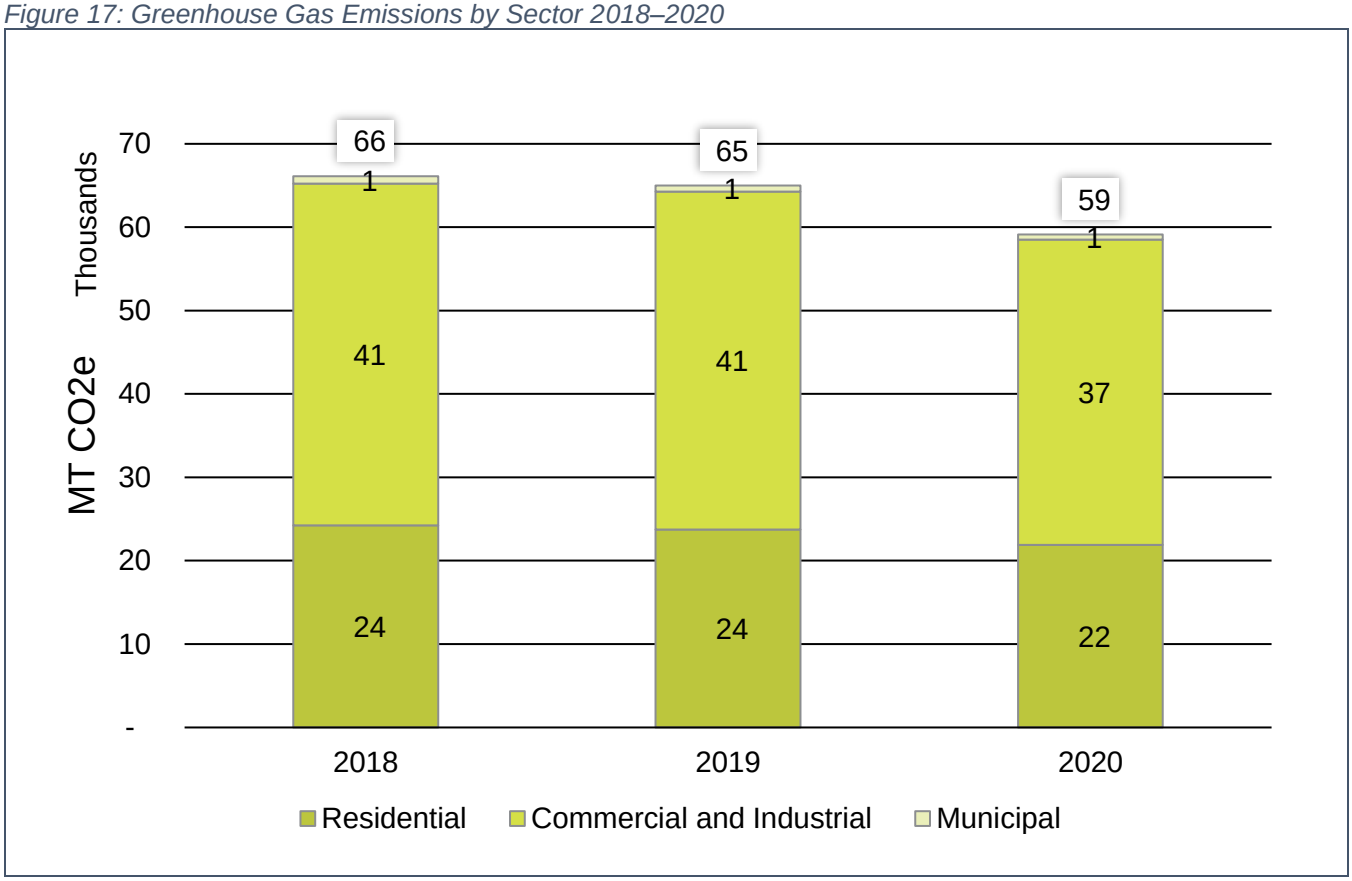
Greenhouse Gas Emissions and Trends

Greenhouse gasses created from the production of the energy consumed in Ashland for the three-year baseline averaged 63,429 MTCO2e annually. This is equivalent to the greenhouse gas emissions from 13,795 passenger vehicles driven for one year.[7]

Annual greenhouse gas emissions in Ashland decreased over the baseline period between 2018 and 2020. While emissions decreased in all sectors, the commercial and industrial sector saw the greatest reductions in emissions. Nevertheless, this sector is still responsible for most of Ashland's greenhouse gas emissions. The greenhouse gas emissions are consistent with the total energy consumption for the three-year baseline in Ashland.

[7] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

Figure 17: Greenhouse Gas Emissions by Sector 2018–2020



Energy Costs

Over the baseline period, an average of over $13 million was spent on energy costs each year across all sectors. Electricity accounts for most energy costs in Ashland. The average residential premise spent $1,300 annually on energy during the baseline period. Commercial and industrial customers spent nearly $8.5 million on energy annually over the baseline period. Costs per commercial and industrial premise averaged $10,000 annually but vary greatly depending on energy use.

Table 15: Average Annual Energy Costs by Sector and Fuel Source

Sector	Total Costs	Electricity Costs	Natural Gas Costs
Residential	$4,710,313	$2,696,606	$2,013,707
Commercial and Industrial	$8,213,066	$6,433,456	$1,779,610
Municipal	$140,861	$91,099	$49,762
Total	**$13,064,240**	**$9,221,162**	**$3,843,078**

Program Participation and Savings

Xcel Energy and Focus on Energy offer programs to Ashland residents and businesses to increase their home or buildings' energy efficiency. Rebates for new equipment, audit programs and discounted or no-cost energy measures are available in addition to load management programs.

Ashland residents and businesses saved more than 5.2 million kWh and almost 130,000 therms through program participation during the baseline period. Program participation varied each year, depending on program availability, outreach campaigns and utility outreach. 2018 marked the highest participation among residents and businesses and most incentives paid by Focus on Energy and Xcel Energy. Program participation was higher in 2020 than 2019, but there were fewer incentives paid in 2020 than in 2019. Popular programs included lighting and rooftop unit rebates for businesses and energy savings packs for residents.

Between 2018 and 2020, customers in Ashland received almost $530,000 in incentives from Focus on Energy. In addition to the incentives paid by Focus on Energy, Xcel Energy offers additional bonus incentives for certain Focus on Energy rebates and programs. Over the baseline period, Ashland customers received almost $80,000 in bonus incentives from Xcel Energy.

Table 16: Focus on Energy Program Participation by Sector 2018–2020

	2018	2019	2020	Total
Residential Program Participation	2,792	253	933	3,978
Residential Electricity Savings (kWh)	223,753	58,347	130,398	412,498
Residential Natural Gas Savings (therms)	12,694	7,742	5,090	25,526
Residential Incentives Paid	$63,074	$23,384	$28,442	$114,900
Business Program Participation	454	657	495	1,606
Business Electricity Savings (kWh)	2,527,419	1,494,557	742,882	4,764,858
Business Natural Gas Savings (therms)	50,367	34,068	19,014	103,449
Business Incentives Paid	$221,570	$129,997	$63,530	$415,097
Total Participation	3,246	910	1,428	5,584
Total Electricity Savings (kWh)	2,751,172	1,552,904	873,280	5,177,356
Total Natural Gas Savings (kWh)	63,061	41,810	24,104	128,975
Total Incentives Paid	$284,645	$153,381	$91,972	$529,997

Table 17: Xcel Energy Bonus Incentives Paid by Sector 2018–2020

	2018	2019	2020	Total
Residential Customers	$12,780	$5,840	$2,820	$21,440
Business Customers	$29,089	$19,190	$9,637	$57,916

Renewable Energy Support

About 2% of residential premises and 1% of commercial and industrial premises are subscribed to either a renewable energy subscription program or a community solar garden. Top renewable energy programs in Ashland were Xcel Energy's Windsource and Xcel Energy's Renewable*Connect for both residents and commercial and industrial customers. On-site solar installations were less popular and only eight incentives were paid for photovoltaic systems by Focus on Energy from 2018 to 2020.

Table 18: 2019 Renewable Energy Program Participation by Program and Sector

	Residential	Commercial and Industrial
Xcel Energy Windsource®		
Subscriber Count	146	2
Total Annual Electricity Subscribed (kWh)	68,060	7,095
Percentage of Sector Electricity Use	0.29%	0.01%
Xcel Energy Renewable*Connect®		
Subscriber Count	152	2
Total Annual Electricity Subscribed (kWh)	265,402	23,958
Percentage of Sector Electricity Use	1.12%	0.04%
Xcel Energy Solar*Connect Community®		
Subscriber Count	9	6
Total Annual Electricity Subscribed (kWh)	26,651	477,733
Percentage of Sector Electricity Use	0%	1%
Focus on Energy Renewable Rewards		
Participant Count	7	1
Incentives Paid	$10,285	$3,831

APPENDIX 5: IMPLEMENTATION MEMORANDUM OF UNDERSTANDING

To be inserted once approved by City Council.

Background on Comprehensive Planning:

from Extension website: “A comprehensive plan is a document that describes a long-term vision that a community wants to achieve. It is a broad brush look at the entire community in terms of where it is now, and where it would like to be in the coming years. It looks at the many parts of the community, how the community functions, and its role in the region. A comprehensive plan is intended to provide a rational basis for making local land use decisions and to serve as a blueprint for community-wide efforts to achieve its vision.

“Ashland County and all the municipalities within the county developed and approved comprehensive plans in 2005-2006. State law (Wisconsin Statutes 66.1001) dictated the process and components of a comprehensive plan and that once adopted, plans should be reviewed at least every 10 years. That most recently revised Comprehensive Plan and Farmland Preservation Plan was reviewed and approved at the December 15, 2016 Ashland County Board of Supervisors meeting.”

State law requires comprehensive plans to include the following chapters, though additional chapters may also be included: Issues and Opportunities; Housing; Transportation; Utilities and Community Facilities; Agricultural, Natural, and Cultural Resources; Economic Development; Intergovernmental Cooperation; Land-use; and Implementation. These plans guide county projects and activities. Additionally, municipalities within the county try to align their comprehensive plans with those of the county, such that municipalities’ projects and activities are also somewhat guided by this plan. For reference, the City of Ashland’s most recent Comprehensive Plan is available here.

Ashland County 2006 Comprehensive Plan Vision and Goals:

Vision: We envision a County that recognizes the diversity of rural, forested, community and village life. By joining together, we become stronger and more efficient in meeting our citizen’s needs. We are challenged to maintain and improve land, air and water quality in an increasingly complex world.

Goals: To meet these challenges, the County will...

- Have robust economic development throughout the county to remain competitive in attracting new businesses and supporting existing businesses
- Have a thriving local economy that attracts and retains young people, state-of-the-art infrastructure, the most up-to-date telecommunications, well-qualified workforce with a high-quality of life, and ample job opportunities providing a living wage
- Maintain a high-quality natural resource base and preserve our air, land and water at the highest level for future generations
- Continue its position as a steward to county, state, and federal forest lands, fish, and wildlife through collaboration with different agencies and organizations
- Have quality and affordable housing opportunities for all residents

- Continue to provide both natural resource opportunities and cultural resource opportunities that attracts people to the county, and continues to recognize the importance of tourism in the County
- Continue to support the main economic drivers of the county including manufacturing, forestry, tourism, agriculture, education and health services
- Support childhood and life-long learning through strong k-12, two-year and four-year higher educational institutions

City of Ashland's Sustainability Committee's Role:

We have a potential role in providing input to the current update of the County's Comprehensive Plan. Already, Ashland County Extension (Lissa Radke) has convened experts in five working groups to provide input on sustainability themes for the updated comprehensive plan: Transportation; Utilities and Community Facilities; Agricultural Resource; Natural Resources; and Land-use. I was involved in one of these groups and based on my experiences I feel confident that robust input was gathered around these topics. Community input is now being gathered through community surveys and planned town halls. We can provide input as community members at these town halls and by providing specific recommendations from this committee to the Ashland County Planning Committee.

Questions to Consider:

- What might be missing from the 2006 Vision and Goals?
- What is no longer relevant or needed from the 2006 Vision and Goals?
- How can the 2006 Vision and Goals be edited to better represent the ethos of sustainability?

Some Ideas to Consider:

- Add a sustainability goal, such as "Ensure the County's economies, communities, and environments thrive for current and future generations of people and nature."
- Recommend sustainability-oriented objectives for appropriate chapters:
    - Energy in the county is produced through renewable resources, sourced locally, and utilizing local contractors and service providers.
    - Novel synthetic chemicals (i.e. PFAS, microplastics) are monitored in the environment. Their release into the environment is controlled and high concentrations in the environment are remediated.
    - Biodiversity is maintained through conservation lands, ecosystem restoration, and control of non-native species
    - Future climatic conditions and associated weather risks are considered in all planning, investments, and projects.
    - Biogeochemical flows in the environment (i.e. phosphorous and nitrogen) are monitored and controlled to maintain ecosystem health and safe water for drinking and recreating

    - Freshwater changes (soil moisture, river and lake levels, water temperature) are limited by maintaining and restoring healthy ecosystems and planning for future hydroclimatic conditions
    - Indoor and outdoor air quality is monitored and communicated to the public. Residents are educated on the impacts and dangers of poor air quality. Programs help individuals limit their exposure to poor air quality and its effects.
    - Economic development incorporates maintenance of healthy ecosystems and other natural resources for future generations and balances the needs of residents and tourists.
    - Cultural resources are preserved through vibrant programs (i.e. language, arts, and crafts) that adapt to residents' needs
    - High-quality services (i.e. medical care, education, emergency services) are available to all
    - Interconnected communities, transportation access, and other services ensure that all residents have access to social relationships and social isolation is reduced
    - County population remains stable or changes slowly. County services are flexible to scale with changes in population.

Further Inspiration:

The 2023 update to the Bayfield County Comprehensive Plan includes numerous goals and objectives related to sustainability. Here are some that I selected out to highlight:

- Transportation:
    - Goal 3: The future transportation system should be flexible, multi-modal, incorporate technologies to support the transition to electric vehicles, and provide for the needs of citizens and businesses in Bayfield County.
        - encourage bike trails
        - develop a county-wide trail plan
        - additional right-of-ways
        - alternative fuel filling station
        - encourage ride sharing programs
    - Goal 4: Pursue alternative fuel sources for fleet vehicles as technology becomes available.
- Utilities and Community Facilities
    - Goal 1: A clean, resilient energy supply that makes use of cost-effective renewable resources while protecting Bayfield County’s natural resources, which are consistent with and contribute to the County’s goal of net-zero carbon emissions by 2050.
        - county-wide EV infrastructure plan
        - track energy use by county-owned facilities
        - county-wide energy resilience plan
        - smart grid

        - solar-friendly zoning codes
        - focus on energy
        - consider large-scale solar locations and plan and zone accordingly
        - encourage RE with local utilities, promote siting RE projects now
        - educate residents on energy savings
        - ID and map potential resilience centers
        - develop RE at essential service locations
    - Goal 3: Support and strengthen essential services to protect the public health, safety, and welfare of the community.
        - Develop a countywide plan that provides guidance to municipalities re: climate-change induced impacts to waste treatment and water treatment plants.
    - Goal 4: Recognize the value and everyday importance of Bayfield County's parks and community centers, libraries, civic buildings, and cultural assets by investing in their maintenance and improvement.
        - ID, fund, and update all County-owned buildings with HVAC systems (and hot water heaters, windows, and building insulation) older than 20 years. Replace with high efficiency HVAC systems.
- Ag, natural, and cultural resources
    - Goal 1: Protect, maintain, and enhance lakes and streams, wetlands, forestlands, aquatic and terrestrial habitats, and groundwater to maintain water quality, ecologic function, and recreational and aesthetic values.
        - tech assistance for landowners
        - slow the flow
        - zoning and tech assistance to slow erosion and slumping
        - habitat
        - invasive species
        - protect lakes and streams
    - Goal 2: Reduce and mitigate surface and groundwater impacts from agricultural land use activities...
        - nutrient management planning
        - farmland preservation plan
        - increase minimum parcel size?
        - fish creek and marengo watershed plans
    - Goal 3: Enhance or improve climate resiliency across all natural landscapes, with an emphasis on forests, and increase natural carbon sequestration to the extent needed to achieve the County’s goal of net-zero carbon emissions from County operations by2040 and from all County sources by 2050.
        - establish forest ecosystem trends
        - larger minimum parcels to reduce habitat fragmentation
        - sustainable forestry practices
        - carbon-balanced county forests
        - reduce carbon loss from disturbances
        - promote perennial crops and rotational grazing

    - Goal 4: Increase the climate resilience for planning, design, engineering, and construction of future projects due to more intense weather events.
        - plan for 100-yr storms
        - stay up-to-date on trainings
    - Goal 5: Protect, restore, and enhance sustainable fish and wildlife populations andhabitat through an integrated ecosystem approach.
- Economic Development
    - Goal 4: Bayfield County will invest in infrastructure improvements needed to support modern economic development and community needs.
        - ID potential grant-funded RE projects
- Hazard Mitigation
- Land Use
    - Goal 1: Ensure that land use and development is compatible and harmonious with the natural environment.
        - minimum lot sizes to decrease fragmentation
        - promote high-density development at appropriate sites
        - minimize # driveways
        - more through-streets, less dead ends
        - parking standards
        - develop BMP for light pollution
        - encourage dark skies
    - Goal 3: Protect water resources in volume and quality.
        - study artesian water system
    - Goal 4: Protect and preserve agricultural and forestland uses and the overall economic viability of working lands within Bayfield County.

Boreal Waters Community Foundation – Spring Grant Cycle

These grants support projects that emphasize collaboration and create lasting positive change. They each have a grant range of $25,000 - $50,000 and focus on three key areas:

Opportunity – Projects empower individuals to achieve economic stability and independence. **Examples:**

- Expands access to affordable housing
- Creates jobs that pay a living wage
- Supports wealth-building opportunities
- Provides access to high-quality education
- Strengthens economic well-being through essential support services

Resilience – Projects must enhance the ability of organizations, families, or communities to anticipate, adapt to, and recover from challenges, creating sustainable, long-term solutions that reduce risk and promote resilience. **Examples:**

- Leveraging partnerships and resources to implement scalable, lasting solutions that strengthen community resilience.
- Expanding access to knowledge, training, and tools that improve economic, social, or environmental stability for individuals and families.
- Developing community-driven solutions that address housing stability, food security, workforce resilience, or climate adaptation.
- Applying innovative or proven strategies that increase a community's ability to prepare for and respond to systemic challenges (e.g., disaster preparedness, economic shifts, public health crises).

Belonging – Creating spaces and opportunities where all people are valued, heard, and are able to thrive. Projects amplify voices, foster creative expression, and create a vibrant, inclusive culture. **Examples:**

- Elevates diverse voices and perspectives, particularly those from historically marginalized communities.
- Embraces the common humanity of all individuals.
- Implements practices that increase connection, respect, and safety.
- Strengthens community bonds and promotes equity for all.

The Boreal Waters CF also offers awards in the $500 - $8,000 range.

Applications for the Spring 2025 grant round will open on January 5 and must by submitted by February 2.

Kettering Family Foundation (Most competitive as well as most loosely aligned)

Grant Guidelines

All prospective applicants to the Kettering Family Foundation must communicate their interest in applying and discuss their proposal with Foundation personnel prior to initiating the application process. Please send an email to info@ketteringfamilyphilanthropies.org to initiate a conversation.

The Kettering Family Foundation (KFF) will consider activities in the following categories:

- Arts, Culture and Humanities
- Education
- Environment
- Health/Medical
- Human Services/Public & Society Benefit

Organizations that are not units of government or affiliated with a religious organization must have a current 501(c)(3) determination letter from the Internal Revenue Service (IRS). Fiscal sponsorships will be accepted, but only under special circumstances and prior arrangement must be made before applying. Request Summaries for any of the following purposes are rarely considered.

Application Guidelines

The Foundation administers two grant cycles per year, January through May and July through November. Only one application may be submitted during a twelve-month period.

The application, which is fully website-based, consists of two parts: a Request Summary and an invitation-only Full Proposal. **To be considered for a grant, all applicants must submit a Request Summary by January 31 or July 31.**

- Request Summaries are reviewed by the appropriate grant committee and if they are interested in the application, will request a Full Proposal.
- Invited Full Proposals must be submitted on the website no later than March 15 or September 15.
- Funding decisions are made in May and November and funded grants will be paid in June and December.

- You will be advised by email of the outcome of the Committee's review in approximately three weeks from the final deadline.
- Notice of approval or denial will be communicated to you within 10 days of the Committee's meeting. If you are awarded a grant, the chief executive officer of your organization will be required to sign a **Grant Recipient Agreement** that outlines the duties and responsibilities of being a grant recipient. Generally, grants are paid within 45 days of the Committee's meeting.

Kettering Grant History

During the last three calendar years, The Kettering Family Foundation paid a total of $19,695,642 to charitable organizations throughout the United States, primarily where family members reside.

2024 Grants Paid by Category

Arts/Culture/Humanities	$1,630,000
Education	$1,549,000
Environment	$899,000
Health/Medical	$1,480,000
Human Services	$1,362,000
Public/Society Benefit	$19,000
	$6,939,500

HEAD OF THE LAKES UNITED WAY

Up to $12,000 for each of 2 years - Grant period is open now until Jan 2.

Priority Focus Areas – Health, Education and Fiscal Literacy

Three step process – 1:1 sit down pitch, grant application and then follow up conversation about the project. Reviewed by a committee.

We would need to create a team for the 1:1, grant-writing and follow up conversation.

WM (Waste Management Foundation) – Rolling Deadlines

The purpose of this program is to provide financial assistance and/or in-kind services for projects by nonprofit and public organizations to make communities safer, stronger, and more sustainable. Award recipients must use donations exclusively for public purposes.

Projects must support meaningful community involvement. The funding agency utilizes the following funding principles:

- Environmental stewardship: with a commitment to sustainability, priority consideration will be given to organizations whose programs preserve and/or enhance renewable resources and empower environmental stewards
- Environmental justice: engaging with people in the communities where the funding agency operates to understand their needs and address operational impacts to help those communities thrive; refer to *wm.com/locations* for a map of service locations
- Sustainability education: equipping individuals with knowledge needed to enhance their communities through programs that support clean, resilient, and sustainable places to live
- Workforce and skills development: giving individuals the tools and training they need to excel while empowering employees to take care of customers, neighbors, and their environment via programs that prioritize economic mobility
- Community vitality: ensuring that neighborhoods and communities are safe and sustainable
- Supplier diversity: addressing inequity and economic development for underserved groups