PART 2:

COMMUNITY SUSTAINABILITY PLAN

Contents

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II. Introduction

This plan recommends actions that support local collaboration and improved sustainability, primarily in the unincorporated towns of La Crosse County.

Sustainability is the practice of managing consumption of resources to avoid destabilization of the planet's ecological balance, while meeting present global needs without compromising humanity's ability to meet future needs. There's a limited supply of many resources, such as land, water, fertile soil, minerals, and hydrocarbons that La Crosse County relies upon to maintain adequate services for residents. Negligent consumption of these natural resources affects the global ecological balance and proliferates the negative impacts of climate change.

In the fields of economics and ecology, the metaphor "the tragedy of the commons" illustrates that when individuals and organizations ignore the impacts that their consumption of limited resources has on others, everyone often bears the consequences. In the case of global climate change, we are experiencing, and our descendants will continue to experience, the long-term consequences of past and present behaviors. If action isn't taken, climate change will create further barriers to improving sustainability. As human population and consumption increases and living systems such as ecosystems, forests, waters, wildlife, and soils deteriorate, the margins of positive impacts of sustainability improvements decrease.

Many ecological impacts resulting from human behavior are unavoidable, but it's possible to improve local sustainability through actions that balance the needs of residents, private employers, and the environment to mitigate negative impacts they may have on each other. Some actions are especially unsustainable and significantly impact the environment, and correcting those unsustainable actions must be prioritized. Implementing sustainable actions often reduces impacts of climate change and can be restorative to environments and living systems. Acting more sustainably can also save taxpayers money by reducing waste and increasing efficiencies in consumption and production of goods.

La Crosse County is one of the largest single employers in the county. It has over 150 fleet vehicles, operates several buildings, and manages a large, regional landfill serving 6 counties. As a result, La Crosse County government has a relatively large carbon footprint. In fact, data gathered for Part 1 of the County's Climate Action Plan (CAP) found that La Crosse County government operations comprise an estimated 2.2% (15, 830 mt CO2e) of all greenhouse gas (GHG) emissions in the county (Olson, 2023). GHGs are gases that absorb infrared radiation in the atmosphere and impact climate.

While emissions from the county landfill are included in the emissions footprint of La Crosse County, most of the waste in the landfill is derived from private individuals and businesses. This is just one example of how public operations of La Crosse County and the decisions and actions of its 120,486 private residents are intertwined. If La Crosse County aims to make significant improvements in local sustainability, it must assist members of the public with reducing

individual environmental impacts. 97.8% of county-wide emissions originated from private individuals and businesses. These emissions result from building usage, personal transportation, consumption of food and water, and generation of solid waste. La Crosse County must broaden the scope of its "climate action" to a community scale if it intends to make impactful progress. This is consistent with the County Comprehensive Plan's finding that residents believe "sustainability" is a community core value that should be prioritized. Moreover, the County Board's 2024 5-Year Strategic Plan identifies environmental stewardship and carbon neutrality as two of its highest priorities.

This document is Part 2 of the CAP and recommends actions that support local collaboration and improved sustainability, primarily focusing on unincorporated towns in the county. These actions will help La Crosse County achieve its own goal of carbon neutrality (Resolution #21-8/20) and create mutual benefits for rural residents, including improved health, lower energy bills, and protecting farmlands and natural environments. Such actions will allow resident to adapt to, or mitigate, impending challenges present by the changing environment to some degree.

By implementing this plan, La Crosse County will help mitigate the anticipated impacts of climate change. The purpose of Climate Action Plan Part 2, the Community Sustainability Plan, is to organize stakeholders and serve the residents and environment of La Crosse County so that impacts of climate change on future generations will be significantly reduced.

Purpose Statement

To represent the intent of this plan, and the community's broad vision for local sustainability, the following Purpose Statement was drafted by the Community Advisory Team (CAT):

La Crosse County's Community Sustainability Plan empowers the community to implement effective and actionable solutions that will reduce harmful pollutants and emissions, promote sustainability, and improve climate resilience for generations of residents. This plan recommends regenerative actions that will preserve our environment and improve the quality of life of residents.

Community Sustainability Plan Elements

Components of climate action and sustainability are organized into 7 "elements." The elements provide a framework for communicating existing and anticipated conditions. Goals and recommendations for local climate action are presented for each element.

The 7 Plan Elements:

1. Environmental Conservation
2. Agriculture & Local Food System
3. Waste Reduction & Diversion
4. Energy Efficiency & Renewable Energy
5. Land Use & Transportation
6. Health, Safety, & Environmental Justice
7. Green Economy

III. Plan Development

Geographic Scope

The scope of the plan applies mostly to the unincorporated areas of the County. To apply this plan effectively, the County must collaborate with multiple departments, agencies, and jurisdictions to carry out a diversified approach to maintaining our local, high quality of life.

La Crosse County aims to encourage local collaboration, as all nearby municipalities are socially and economically co-dependent. Frequently, residents of each municipality use the transportation, water, sanitary sewer, stormwater, energy, outdoor recreation, emergency services, healthcare, and education systems of other neighboring municipalities. Collaboration must be stressed, given that political boundaries and siloed budgets often create inefficiencies in transportation, energy, and services, which can reduce opportunities for improved sustainability and efficiency.

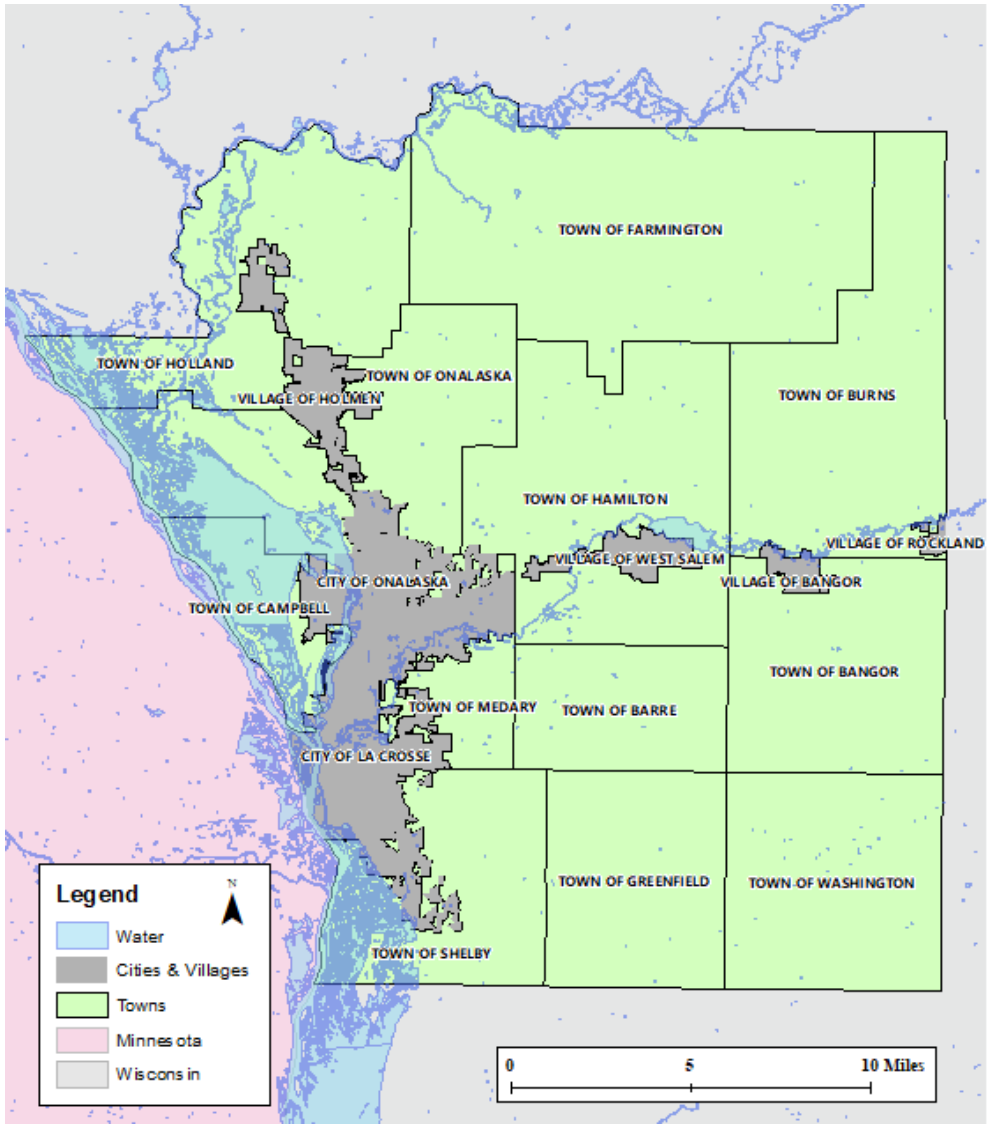
La Crosse County provides different services depending on the department and which jurisdiction it is operating within. The La Crosse County Community/Economic Development Team, Health Department, and Human Services Department, among other departments, function within all government jurisdictions in the county. County Zoning, Planning, and Land Conservation staff administer policies in the towns, while Land Information staff serves all municipalities in some capacity (See Map 1). The Solid Waste Department serves a handful of surrounding counties besides La Crosse. While this plan emphasizes support for rural residents and the unincorporated areas, some goals and recommendations apply county-wide

La Crosse County's sustainability plan will encourage partnerships that create co-benefits and shared efficiencies among all local municipalities. The City of La Crosse, the most populated municipality in the region, adopted its Climate Action Plan in January 2023. La Crosse County intends to align itself with the City's proposed initiatives to achieve more through partnership.

Public Input

La Crosse County Comprehensive Plan – Envision 2050

La Crosse County's Comprehensive Plan, which represents the community's twenty-year vision for the county, was updated in 2022. Between 2020 and 2021, over 1,000 people participated in comprehensive plan surveys, including a sustainability survey, to provide input that helped guide the development of this plan. Meetings with specific stakeholders, including town and village governments and landowners, were also used to gather input and feedback. Public input helped create a shared vision of La Crosse County, and sustainability was identified as a top priority. Findings from the comprehensive plan update process also contributed to this plan's development.



Map 1. Regional Context Map, La Crosse County.

Community Advisory Team

To guide the planning process, a community advisory team was created. The Community Advisory Team (CAT) was comprised of 7 county residents, 3 County Board Supervisors, county planning staff, and occasionally, other county staff from the Land Conservation, Environmental Health, and Solid Waste departments. The CAT met once per month from April to September to provide feedback on draft surveys, open house materials, and the draft plan. The group also completed a climate and public health messaging exercise led by the Wisconsin Department of Health Services which will support a statewide initiative that's currently being developed.

Residents who volunteered to serve on the CAT possessed expertise in a variety of fields, such as agriculture, solid waste and recycling, biology, engineering, sustainability and ecology, and town government. The varied perspectives provided by these community champions ensured that this plan was developed in a way that encouraged public participation and addressed community needs.

Community Sustainability Plan Survey

To understand residents' concerns regarding local sustainability priorities, barriers to using renewable energy and realizing cost savings, a county-wide survey was conducted May – July of 2024. The survey and open houses were publicized by:

- 3 TV segments
- 1 radio segment
- 1 press release
- 5 county libraries
- Posting at town halls
- Posting on County sustainability webpage
- Posting on County social media accounts
- Posting on some town social media accounts
- Sharing at the June 15th Dairy Breakfast
- Sharing at the County Fair

263 responses were received, and the survey questions are included in Appendix E. While many residents of incorporated areas also responded to the survey, staff separated these responses from the responses of town residents. Only the responses from town residents inform this plan, and responses are summarized below.

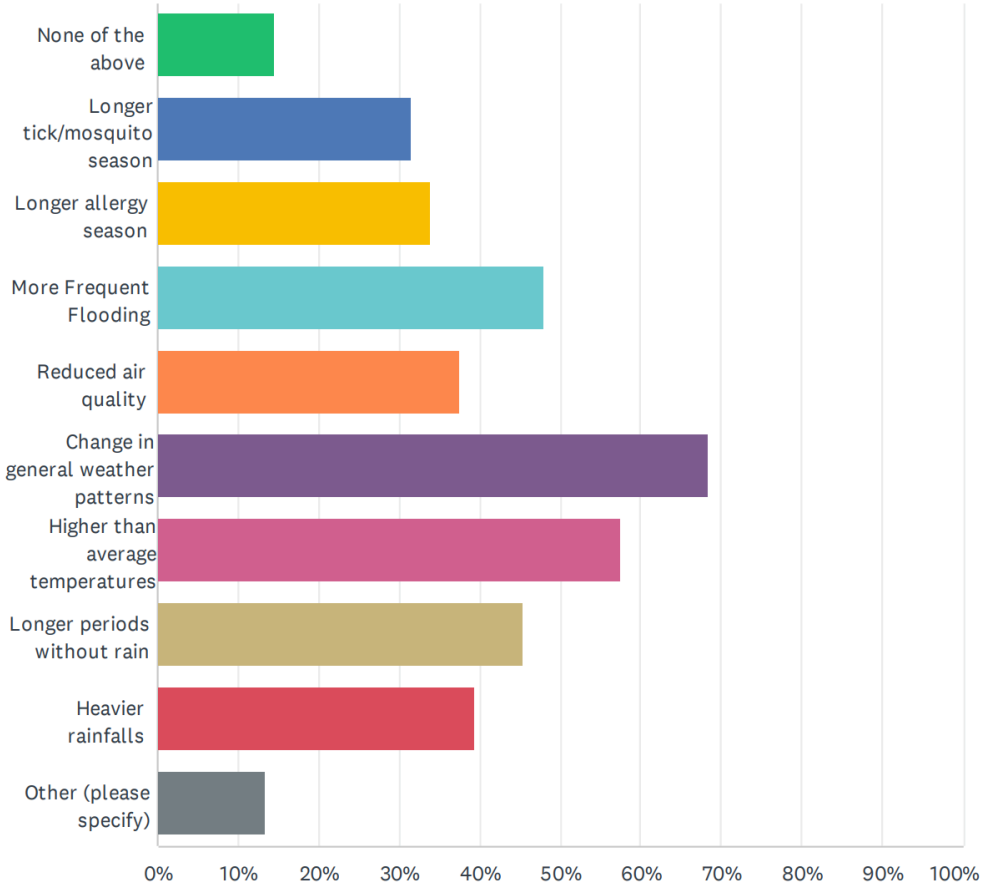
A total of 168 responses were recorded from town residents in the Community Sustainability Plan Survey. The largest percentage of responses, 17.33%, came from the Town of Greenfield, followed closely by the Town of Shelby with 16.77%, and the Town of Farmington with 14.97%. 43.38% of responses were from individuals aged 61 years or older, and no responses recorded from anyone under the age of 18.

When respondents were asked about how they learn about climate change, the most popular source used was the internet, cited by 69.51% of respondents. Additionally, 36.59% rely on family and friends as a primary source of information. Given the variability in reliability of these sources, these may not be the most dependable sources for accurate climate information.

Only 21.95% mentioned that their local government has served as a resource towards understanding climate change. Moreover, when asked what actions they would like to see to help residents and businesses prepare for the impacts of climate change, many respondents expressed a desire for increased education on the topic, as well as education on opportunities for grants or incentives to improve energy efficiency and explore renewable energy options. This highlights an opportunity for the La Crosse County government to serve as a sustainability information resource in the future.

Regarding changes respondents have experienced in their own lives, 68.48% noted a change in general weather patterns, and 57.58% observed higher than average temperatures. Additionally, 45.45% of respondents have noticed longer periods without rain, while 47.88% have also observed more frequent flooding, as noted in Figure 1.

Figure 1. Town Survey Results. Question 5: Have you noticed any of the following? (Select all that apply).



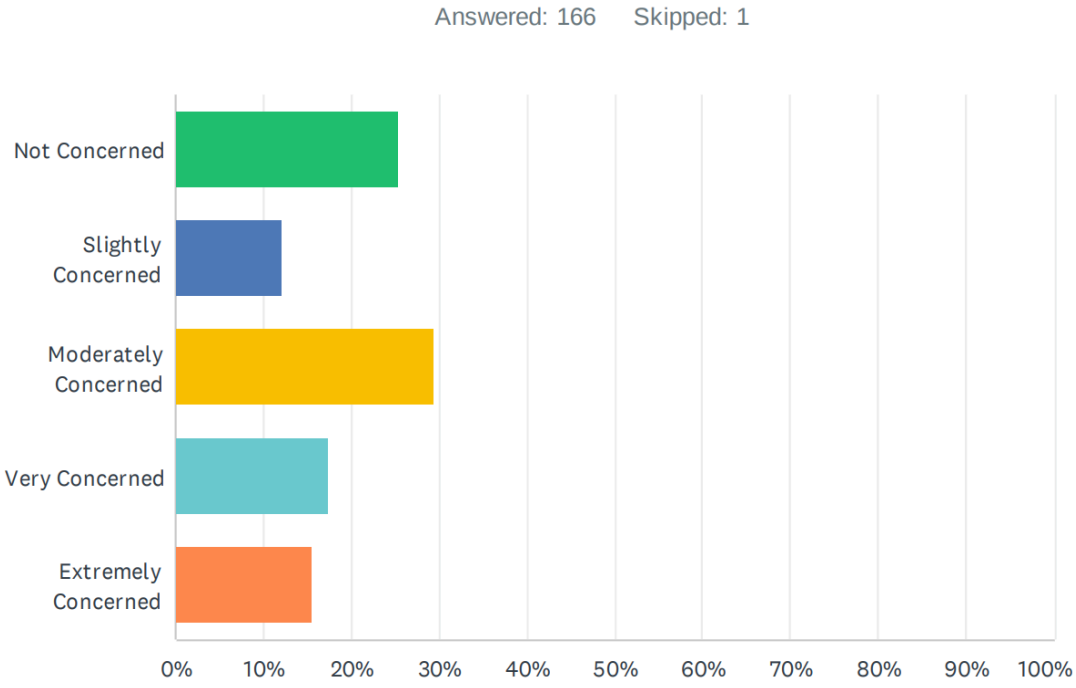
Many respondents attribute increased flooding to an increase in extreme weather events, such as more intense storms. Additional extreme weather events mentioned include out-of-season tornadoes, a higher frequency of hailstorms, and smoke from the increasing number of wildfires in Canada. Others also noted experiencing milder winters with less snowfall compared to previous years.

74.7% of survey respondents who are town residents are at least slightly concerned about climate change.

As seen in Figure 2. 74.7% of respondents range from slightly concerned to extremely concerned about climate change. Several key concerns about how climate change will impact the La Crosse community specifically were identified. Notably, 78.66% of respondents expressed concern about the potential loss of clean drinking water, while 77.5% are worried about possible ecosystem loss. As highlighted in the Environmental Conservation Element, the Driftless region is prized for its natural resources, making the potential loss of various plant or wildlife species a significant concern

Additionally, many expressed worries regarding the effects of climate change towards agriculture, particularly regarding crop production, as well as how future generations will be affected.

Figure 2. Town Survey Results. Question 6: How concerned are you about the impacts that climate change will have on the La Crosse County Community?



Given that most respondents have observed signs of climate change and expressed concerns about its impacts, 69.88% either slightly agree or agree on the importance of investing in infrastructure such as renewable energy. However, 65.58% cited the upfront cost as a significant barrier to energy efficiency upgrades. As respondents considered additional ways La Crosse County can assist residents and businesses in preparing in improving sustainability, many respondents suggested they are in favor increased tax incentives for electrification, renewable energy, and energy efficiency upgrades.

Figure 3. Residents at the Farmington Open House.

Feedback provided for the open response questions (#15, #16, and #17) were highly varied. Open responses include calls for improved recycling programs and a reduction in

pesticide use. Respondents expressed a desire for more accessible public transportation and expanded greenspaces in both urban and rural areas.

Open Houses

In-person open houses were held at 3 locations:

- Wednesday, May 22nd 4:00 - 6:30 PM, Farmington Town Hall (N8309 County Road C, Farmington)
    - 25 members of the public estimated in attendance
- Thursday, June 6th 4:00 - 6:30 PM, Greenfield Town Hall (N1800 Town Hall Rd, St. Joseph's Ridge)
    - 25 members of the public estimated in attendance
- Monday, June 24th 4:00 - 6:30 PM, West Salem Library (702 Industrial Drive, West Salem)
    - 10 members of the public estimated in attendance

Figure 4. Residents at the Greenfield Open House.

An estimated total of 60 residents attended the open houses. The survey and comment sheets were available to complete for those in attendance at open houses. 3 virtual office hours were held the day following each event to discuss the plan one-on-one with members of the public.

IV. Existing & Anticipated Conditions

To understand the most effective ways to improve sustainability in La Crosse County, we must review and understand existing and anticipated conditions in the county. Implementation of this plan will assist residents, businesses, and local government with mitigating and adapting to climate change. Wisconsin can anticipate several impacts of climate change, including, but not limited to, the following:

- As of 2023, Wisconsin's temperatures have increase by 3 degrees F since the 1950's, and projections indicate it will be 2 – 8 F warmer by 2050 (McCoy, M.K., 2020).
- By the 2050's, Wisconsin can expect 3 times as many days hotter than 90 F and 4 times as many days with nighttime lows of 70+ degrees F (Kaeding, D., 2023a).

- In the last 10 years, precipitation in Wisconsin has increased by 17% (5 inches) (Wisconsin Initiative on Climate Change Impacts, 2022).
- The Driftless Area will be negatively impacted by increased flooding and damaged infrastructure because of flooding (Wisconsin Initiative on Climate Change Impacts, 2022).

One analysis completed using artificial intelligence found that the La Cross-Onalaska metro area is far more climate resilient and faces less climate risk than many other metros in the United States. While town-specific data is not available, these scores are likely similar for unincorporated La Crosse County. It is likely, however, that energy reliability in the rural areas would have a lower resiliency score than the metro areas. Based on the metrics of the analysis, La Crosse County's adoption of renewable energy and local infrastructure has fallen behind, and we should prepare for increased inland flooding (Figure 5). As our region is relatively climate resilience, there could be significant, future development pressure due to climate migration as long as local employment opportunities are available.

Public feedback and a significant amount of research on existing & anticipated conditions have been conducted to inform this plan's goals and recommended actions. These conditions are summarized and analyzed in the following sections that detail 7 elements of this plan. For more detailed data on climate change, refer to Appendix C.

	Very Low	Low	Medium	High	Very High
Overall resilience			✓		
Energy transition Renewables	✓				
Energy reliability Power outages				✓	
Social Poverty, household debt				✓	
Economic Income, employment, education				✓	
Infrastructure Spending, airports, bridges			✓		
Health Health-care access, life expectancy				✓	

Source: AlphaGeo. Metrics listed under each indicator do not reflect an exhaustive list of features used to calculate that score. State average resilience scores were used for the New Haven, Connecticut metro area.

	Very Low	Low	Medium	High	Very High
Overall risk	✓				
Coastal flooding	✓				
Inland flooding			✓		
Hurricane	✓				
Heat		✓			
Drought	✓				
Wildfire		✓			

Source: AlphaGeo

Figure 5. Climate risk and resilience scores for the La Crosse-Onalaska metro relative to other U.S. metros. Source: The Washington Post

Part 2

ELEMENT 1:

ENVIRONMENTAL CONSERVATION

Element 1: Environmental Conservation

The scope of this plan emphasizes Element 1: Environmental Conservation. Most of the remaining natural areas in La Crosse County exist in the unincorporated areas. The Driftless Area's natural beauty and environment serve as the foundation of the identity of La Crosse County. Implementation of this plan will emphasize the conservation and protection of local land and water resources. In addition to conserving these assets, improving, and expanding them will improve the community's climate resilience and increase local "carbon sinks".

Surface Waters

Maintaining healthy waterways is essential not only for preserving local biodiversity and safeguarding aquatic life and habitats, but also for upholding the high quality of life enjoyed by La Crosse County residents. Three major rivers converge in La Crosse County: Black River, La Crosse River, and Mississippi River. The Mississippi River and other water bodies are integral to the cultural identity of the area, providing opportunities for fishing, swimming, and kayaking, as well as access to safe drinking water.

Figure 6. Source: MississippiValleyConservancy.org

La Crosse County encompasses three HUC 12 watershed basins: the Black River Basin in the northern third, the La Crosse River Basin in the central half, and part of the Coon Creek Watershed. All drain into the larger Upper Mississippi River Watershed Basin. Beyond these, La Crosse County has 274 miles of streams, covering 983 surface acres, excluding the Mississippi River. A large, man-made lake, Lake Neshonoc (600 acres), is located northeast of West Salem.

In La Crosse County, there are 10 waterbodies on the State's 303(d) impaired waters list, 9 exceptional waterbodies, and 2 outstanding waterbodies. Impaired waters do not meet water quality standards and may not support fishing, swimming, recreating or public health and welfare. Water impairment can result in fish kills and make waterbodies unsafe
for public recreation. Figure 7 represents the Department of Land Conservation's 2018 water conditions assessment findings. Water quality standards are established by the Wisconsin Department of Natural Resources (WNDR), and quality standards do not exist for all potentially harmful substances.

Occasionally, public beaches, including Neshonoc Swarthout Beach, are closed due to high levels of fecal coliform bacteria contamination that runs off non-point sources into surface waters.

Much of La Crosse County Department of Land Conservation's (DLC) watershed management work is grant funded. DLC has been conducting water quality monitoring initiatives since 1995, starting with the Dutch Creek monitoring station, before moving onto a county-wide base flow sampling program in 1998. Water quality samples over time serve as a valuable indicator of the overall quality of each stream.

In recent years, the DLC has completed significant projects in the Bostwick Creek Watershed in accordance with its EPA approved Nine Key Elements Plan. These grant-funded public-private partnerships with landowners result in installation of best management practices that include, but are not limited

Outstanding Resource Waters

- Berge Coulee
- Timber Coulee Creek

Exceptional Resource Waters

- Larson Coulee Creek
- Hoyer Coulee Creek
- Little Burns Creek
- Burns Creek
- Dutch Creek
- Poplar Coulee Creek
- Bostwick Creek
- Coon Creek
- Fish Creek

Impaired Waters 303(d)

- Lower Black Creek
- Mississippi River
- Long Creek
- Halfway Creek
- Johnson Coulee Creek
- Gills Coulee Creek
- Adams Creek
- Lake Neshonoc
- Fleming Creek
- Lower Bostwick Creek

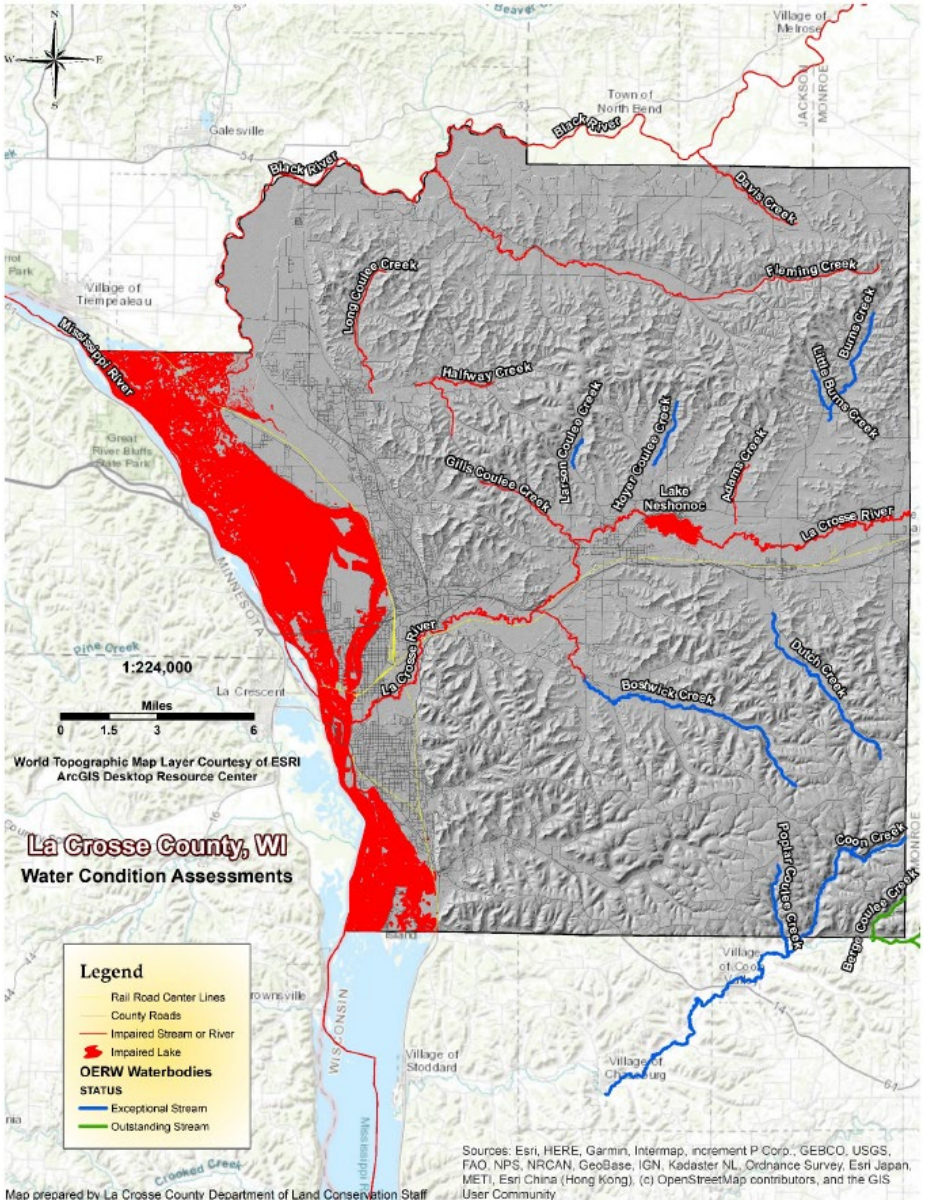


Figure 7. La Crosse County Water Conditions Assessment (2018). Source: La Crosse County Land and Water Resource Management Plan.

to, streambank stabilization, grass waterways, and grade stabilization that reduce erosion and improve water quality.

Overall, information in the County's Land and Water Resource Management Plan indicates that the northern half of the county has streams with lesser water quality, while streams in the southern third had the highest water quality. Using a combination of both County and Wisconsin DNR data for the various streams has helped determine where to maximize the benefits of conservation efforts. This watershed approach improves water quality by reducing total phosphorus, fecal coliform bacteria, and sediment so that surface waters are safe for aquatic life and recreation. Elevated pollutants in local waters threaten public health, public recreation, tourism, and economic opportunities in the region.

While manure is a beneficial tool for increasing crop yields, it is often overused, and runoff into surface waters occurs. In response to nutrient application concerns, several levels of standards and regulations regarding animal waste usage in Water Quality Management Areas have been passed, including Wisconsin Act 27, Chapter 23 in the La Crosse County Code of Ordinances, and ATCP 51 (La Crosse County Department of Land Conservation, 2020).

Dams

Fourteen flood control dams constructed in the mid-20th century control 27% of the waters in the Coon Creek Watershed. Part of this watershed is in southeastern La Crosse County. The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) is leading an initiative to remove earthen dams to prevent future dam failures and breach damages that could result in property damages, erosion, and sedimentation. Two of the dams that will be decommissioned are in La Crosse County.

Figure 8. Aftermath of a 2018 earthen dam break due to heavy rain events in Monroe County. Source: LaCrosseTribune.com

Dam removals restore alluvial channel morphology and associated stream and riparian habitat for the breeding, growth, and development of fish and wildlife. Man-made dams can harm natural ecosystems and contribute to devastating, and at times deadly, dam breaches during extreme weather events. The need for Federal action arises from the failure of three dams in nearby Monroe County in 2018. Subsequent engineering investigations determined that the remaining 11 dams in the area present a high risk of failure. Allowing water to spread naturally, rather than impounding it, will reduce flash flooding, reduce stream bank erosion, improve stormwater infiltration, strengthen ecosystems, save taxpayers millions of dollars, and potentially save lives.

Greenspaces

The term "greenspaces" broadly represents forested areas and naturally vegetated areas in La Crosse County that comprise most local carbon sinks and improve stormwater infiltration. After the 19th century logging industry boom, more than a century of urbanization, and the modern industrialization of agriculture, today La Crosse County consists of 92,895 acres of woodland, making up more than 44% of non-urban, county land. These woodlands consist of 65% oak and hickory, with other species such as maple, birch, pine, and aspen making up the smaller percentages.

While reforestation has increased since the 1930's, as the steep slopes that native trees are typically found on have slowly recovered from logging, there are still many ecological concerns. Significant habitat loss has occurred in Wisconsin with less than one percent of oak savannas, and roughly 0.1% of native prairies, remaining. As these landscapes diminish, various threatened species such as the ornate box turtle, little brown bat, and peregrine falcon face loss of habitat. Local habitat restoration efforts aim to protect and restore the rare oak savannas through prescribed burns, conservation easements, and removing invasive species. (Mississippi Valley Conservancy, n.d.).

Woodlands commonly feature erosion-prone stony or sandy soils formed due to extensive deposits of loess carried into the county approximately 10,000 years ago following glacial retreats. As many of these woodlands have been converted to cropland, intensive agricultural practices, such as over-tilling, have increased the rate of erosion of these soils (La Crosse County Department of Land Conservation, 2020). Maintaining healthy soils and limiting erosion is not only important in protecting natural habitats and wildlife, but it's also necessary to sustain continued agricultural uses.

Moreover, the bluffs, parks, and green spaces within the county allow residents to engage in recreational activities such as hiking, snowshoeing, skiing, hunting, and more. Regular interaction with nature has numerous benefits, including improved physical and mental health, showcasing the importance of these natural environments for the broader La Crosse community (Barton et al., 2017).

Environmental Conservation Goals & Recommended Actions

Goal 1: Increase natural areas, green spaces, and carbon sinks to improve climate resilience.

- Action 1.1. Hold an annual tree sale or giveaway to increase greenspaces and carbon sinks. Provide maintenance information to participants. Establish programmatic goals.
- Action 1.2. Expand pollinator-friendly, native plantings county-wide. Establish a fund and partner with property owners to plant several acres annually.

- Action 1.3. Provide financial support to, or collaborate with, land trusts to protect critical natural areas, particularly those on or near waterways. Incentivize dedication of lands for protection using conservation easements.
- Action 1.4. Use federal, state, or non-profit programs that promote afforestation and purchase lands to improve continuity and expansion of the County Forests. Sequester carbon through planting on new vegetation in these areas.
- Action 1.5. Protect and restore natural systems that protect the community from flooding, including parks, wetlands, riparian areas, and natural drainage ways/swales. Conduct a GIS analysis to identify areas of opportunity.
- Action 1.6. Identify opportunities for increased forestry and forest management at county parks and county forests. Sequester carbon by planting more trees at county-owned properties.

Goal 2: Engage community members to share information and expand local conservation efforts.

- Action 2.1. Offer technical guidance and financial support to towns that wish to develop and implement stormwater utility policies to improve water management, reduce flooding risks, and enhance water quality.
- Action 2.2. Assist with the Soak It Up urban stormwater management program, aimed at improving water quality and reducing runoff through green infrastructure and community engagement initiatives.
- Action 2.3. Design and implement demonstration projects in collaboration with community members, such as planting native species in open spaces within business parks adjacent to the landfill, showcasing sustainable landscaping practices.
- Action 2.4. Continue to partner with landowners in the Bostwick Creek and Coon Creek Watersheds to improve water quality.

Goal 3: Reduce human impacts to natural areas.

- Action 3.1. Educate community on integrated pest management practices and best management practices to minimize chemical use on lawns.
- Action 3.2. Reduce salt used on roads as much as possible. Host Wisconsin Salt Wise workshops to educate salt applicators on best salt management practices. Require salt applicators to obtain a Salt-Wise Certification.
- Action 3.3. Incentivize or require green infrastructure and minimum green space provisions to offset impacts of impervious surfaces constructed in new subdivisions. Encourage or require tree plantings in new subdivisions.
- Action 3.4. Require large commercial and light industrial business developments to create comprehensive stormwater management plans that establish infiltration and pollutant reduction standards reduce flooding on neighboring properties.

Goal 4: Analyze the health and quality of the local environment to identify and address barriers to local sustainability.

- Action 4.1. Conduct a GIS analysis to assess opportunities for rehabilitation of habitats, impaired water sources, soil, forests, and prairies.
- Action 4.2. Map stormwater conveyance systems within the County's Storm Sewer System area to analyze existing infrastructure.
- Action 4.3. Continue to periodically update and implement the County's Land and Water Resource Management Plan. Expand funding and implementation where feasible.
- Action 4.4. Conduct biannual water quality sampling of the County's 27 watersheds. Implement practices that reduce phosphorous and fecal coliforms in waterbodies.

Part 2

ELEMENT 2:

AGRICULTURE AND LOCAL FOOD SYSTEM

Element 2: Agriculture & Local Food System

Agriculture is part of the community's cultural heritage and produces raw materials for foods and fuels that are vital to human society. Serving as a foundational component of the economy, agriculture strongly influences cultures and communities. Agriculture is also among the contributors to climate change. It's a source of greenhouse gas emissions including methane and nitrous oxide, primarily due to livestock and manure. Project Drawdown estimates that ~24% of global greenhouse gas emissions can be attributed to agriculture, 4% of which is attributed to methane from animals, and 5% is attributed to fertilizers/manure used for crops (2021). Conversely, agriculture presents opportunities not only to mitigate greenhouse gas emissions but also to enhance carbon sequestration, effectively removing emissions from the atmosphere (Toensmeier et al., 2020).

Figure 9. Source: www.Food.Systems

As the climate changes, food systems will be impacted. Changes in temperatures and precipitation may affect yields, growing seasons, and which kinds of products are grown. People are dependent on food systems that produce, transport, and sell food products. Food systems are complex and interconnected, involving a multitude of stages ranging from production to consumption. This includes activities such as farming, fishing, processing, packaging, transportation, selling, food consumption, and food waste disposal (See Figure 9). These activities also generate waste and GHG emissions. Food systems are influenced by a variety of factors, including physical elements like weather changes, as well as the social, economic, and political climate. All the 7 elements of this plan are related to the food system.

Figure 10. Source: LaCrosseCounty.org/lancon/agriculture

Farmland Preservation

The Wisconsin Farmland Preservation Program was created to help farmers and local governments preserve farmland, protect soil and water, and minimize land use conflicts. Farm preservation zoning prevents the conversion of farms and pastures to alternative uses such as commercial development, roads, or residential subdivisions. By participating in the program, farmers can earn tax credits to protect the interests of both current and future generations of farmers through financial subsidies. As a result, the sprawling expansion of transportation networks and intense commercial-industrial uses that contribute to climate change can be managed and limited due to the protection of large farms.

Landowners who claim a farmland preservation tax credit must comply with Wisconsin soil and water conservation standards. County land conservation departments monitor compliance and issue certificates, with an inspection at least once every four years. These standards include checking that cropped fields and pastures meet a 'tolerable' level of soil loss. Farmers must consider multiple variables such as tilling methods, crop rotations, and expected rainfall levels in order to achieve this (Wisconsin Department of Agriculture, Trade and Consumer Protection, n.d.). While this promotes overall soil health and the economic viability of crop production, it also enables the soil to act as a carbon sink. Additional standards include maintaining adequate vegetative cover along stream banks to reduce sedimentation runoff into water bodies in order to safeguard water quality (Wisconsin Department of Agriculture, Trade and Consumer Protection, n.d.). This is important for protecting aquatic environments, as sedimentation can degrade habitats and disrupt ecosystem health. Farmers are also expected to create and follow a Nutrient Management Plan (NMP), allowing them to access the full benefits of fertilizers and manure in their practices, while lessening the risk of runoff (Wisconsin Department of Agriculture, Trade and Consumer Protection, n.d.). Farmers may also adopt practices beyond the FPP program, such as regenerative agriculture, agroforestry, cover cropping, no-till farming, and rotational grazing, to promote the longevity of their soils and properties. (Khangura et al., 2023).

To qualify for the tax credit, La Crosse County analyzes compliance with mandatory water and conservation standards on all 257 local farms currently enrolled in the program. By 2017, all farms had undergone assessment, with approximately one-quarter of participants now monitored annually for compliance. To streamline the process due to the large number of enrolled landowners, a Self-Certification Program has been introduced. This includes submitting a report of what was planted and what tilling system was used (La Crosse County Department of Land Conservation, 2020).

Protecting the soil and land through programs like the Farmland Preservation Program (FPP) is essential to ensuring the longevity of farming in the region. This commitment to stewardship not only benefits farmers, but it also allows all residents to enjoy access to sustainable production of food and the preservation of a local agricultural heritage. This commitment to stewardship will help future generations continue to thrive in a landscape that is enriched by the legacy of farming.

Owners of agricultural land in La Crosse County are eligible for tax credits due to the adoption of farmland preservation zoning. By limiting urban development and recording deed restrictions as a condition of approval of limited development, the Zoning, Planning and Land Information Department has protected thousands of acres of local farmland in perpetuity. Since January 1, 2013, La Crosse County has protected 14,251 acres of farmland through deed restrictions. All towns besides Medary and Campbell, where geography limits agriculture, have adopted farmland preservation zoning.

Large-Scale Agriculture

According to the USDA National Agricultural Statistics Service, there were 29,000 acres of corn harvested as grain, 55,000 acres of corn harvested as silage, 17,500 acres of soybeans harvested, and 35,300 dairy cows and calves in La Crosse County in 2023 (U.S. Department of Agriculture n.d.). Agriculture significantly bolsters the financial well-being of La Crosse County, contributing $2.2 billion to the local economy. This robust economic impact is largely attributed to the modernization, automation, and industrialization of farming practices. Despite 98% of La Crosse County farms being family-owned, the agricultural landscape is dominated by large-scale operations specializing in commodities such as milk, grain, and cattle & calves, as illustrated in Figure 11 (UW-Extension, 2019).

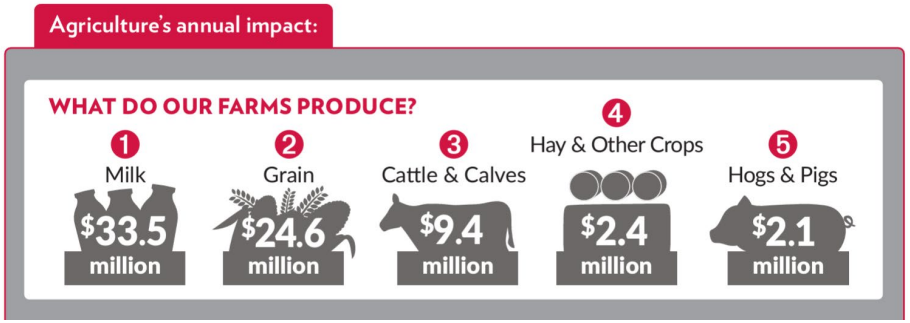


Figure 11. University of Wisconsin Extension.

Small-Scale Agriculture

Since the mid-2010's the number of Americans growing their own food has increased. From 2008 to 2013, the estimated number of households growing at least some of their own food increased from 36 million to 42 million (Gardening boom: One in 3 U.S. households is now growing food - Farm and Dairy). A more recent survey from 2024 found that 45.5 million of American households are now gardening some of their own produce (Gardening Statistics in 2024 (incl. Covid & Millennials) | Garden Pals). Much of this increase is attributed to the Millennial generation, which tends to value self-sufficiency, and 29% of gardening householders are Millennials (Gardening Statistics in 2024 (incl. Covid & Millennials) | Garden Pals). A well-planned, multi-season garden that's 200 square feet or larger can grow enough produce to last an average person a year. There are also opportunities for county residents to volunteer by growing and harvesting food at community gardens such as the La Crosse Neighborhood Gardens.

Despite the prevalence of large-scale agriculture, small-scale agriculture can act as a bridge between rural and urban residents, creating a sense of unity and interdependence. Shorter food supply chains have been shown to not only increase social connections by building relationships between producers and consumers, but also to allow for increased environmental benefits by reducing the need for packaging and transportation (Stein & Santini, 2021). In La Crosse County six different weekly farmers markets are hosted seasonally, offering diverse products including fresh vegetables, flowers, cheese, local honey, art, and music. This provides a valuable opportunity to connect local community members and allow them to engage in and support their local food production.

Locally, Hmoob producers provide the greatest variety of healthy, organic produce, and they significantly contribute to the success of local farmers markets. There are economic challenges to small-scale, local farming of perennial fruits and vegetables, however. Organic, small-scale farming does not produce the same economies of scale as industrialized agriculture, meaning, marginal profits are not as high for small-scale producers. Hmoob farmers often do not own enough acres to produce at a profitable level, and private leases they secure are often unfair to lessees. And of course, the Upper Midwest's climate is not ideal for all foods and vegetables to satisfy local demand.

Community Supported Agriculture (CSA) is a model that allows local members of a community to pledge funding to directly support local farms. In return, the supporters receive an allocation of the food grown on the farm. Food produced by CSAs is fresh, local, and often organic. CSAs create shared, mutual support, risks, and benefits between the supply and demand sides of agriculture. There are a few examples of successful CSAs currently operating in La Crosse County.

Transport of Food

Producing, transporting, and selling food products locally is far more sustainable than importing/exporting products globally. Presently, most of the food consumed by La Crosse County residents likely isn't produced locally. Milk from cows is the primary livestock product locally, and many farms produce monocultures such as corn and soybeans (U.S. Department of Agriculture, 2022). These are the two most prevalent crops in the region, but they mostly are not used for human consumption, rather, they're mainly harvested for ethanol production or livestock feed. This industrialized approach to farming has allowed local farmers to achieve "economies of scale" and reach high levels of productivity and efficiency.

Employment in the Food System

Many residents are employed in the local food system and all residents are served by it. According to the 2022 U.S. Census Bureau American Community Survey (ACS) 5 Year Estimates, 520 residents (0.8% of the local employed workforce) work directly in the "Agriculture, forestry, fishing and hunting, and mining" industry in La Crosse County. 3,911 residents work in "food preparation and serving related occupations" (6.1% of the local workforce). Moreover, 6,776 jobs in La Crosse County are in some way linked to agriculture, spanning roles from farmers and veterinarians to processors and machinery sellers or renters. This underscores the county's heavy reliance on the farming and related food service industries for its economic impact (UW-Extension, 2019). In some parts of the country, "food system councils"/"food policy councils" have been established to improve local food access and grow relationships between related local industries.

Agriculture & Local Food System Goals & Recommended Actions

Goal 1: Assist local producers with becoming climate resilient.

- Action 1.1. Promote agroforestry practices such as expanding tree canopies in livestock pastures to mitigate the effects of increasing temperatures. Establish a program to assist farmers in funding roofed farmyards for livestock.
- Action 1.2. Join the 4 per 1000 Initiative, which is an international initiative consisting of governments, foundations, research organizations, private companies, and farm and forestry organizations who are committed to improving soil carbon management, combating poverty and food insecurity, and mitigating climate change. Review the states-and-local-authorities list of action item commitments and take action that makes strategic sense related to this plan.
- Action 1.3. Provide agricultural labor force training on growing, marketing, and preparing local, climate-resilient food.

Goal 2: Continue to support producers in implementing soil and water conservation best management practices.

- Action 2.1. Establish a grant program to increase agroforestry, natural field and stream buffers, rotational grazing, cover cropping, and irrigation efficiency.
- Action 2.2. Implement the Wisconsin Transition to Grass program to help farmers improve soil, water, and livestock health. https://www.cleanwisconsin.org/bipartisan-transition-to-grass-legislation-will-help-wisconsin-farmers-improve-soil-water-and-livestock-health/?org=825&lvl=100&ite=2490&lea=3254849&ctr=0&par=1&trk=
- Action 2.3. Showcase local conservation projects to agricultural producers and the public. These events will feature demonstrations of successful conservation practices, such as soil health management, water conservation techniques, and biodiversity enhancement.
- Action 2.4. Implement conservation education programs focused on agricultural best management practices, including methods for carbon capture and surface water management. Conduct farmer workshops on nutrient management planning to enhance crop yields, promote soil health, prevent runoff, and reduce environmental impacts.
- Action 2.5. Commission a feasibility study to explore potential opportunities for a biomass “upcycling” facility that would produce value-added biomass products. The upcycling facility could include a regional manure composting operation, a mixed substrate composting operation, and a processing operation for biomass harvested from nutrient catch strips and agricultural land prairie strips.

Goal 3: Improve production of, and access to, local, healthy foods.

- Action 3.1. Establish a Food Policy Council that will advise county officials and staff on enhancing local food supply chains and improving food access. The council will focus on creating local partnerships to increase access to affordable and nutritious food options in the community. Create a Food Systems Plan that addresses the production, distribution, value-added, marketing, end-market, and disposal of food, and charge the Food Policy Council with overseeing the plan’s implementation.
- Action 3.2. Identify and map any healthy "food deserts" within the community and leverage tools, such as grants, incentives, and partnerships with local businesses, to increase access to nutritious food options.
- Action 3.3. Increase local access to plant-based foods by collaborating with retailers and food vendors to expand their offerings of affordable plant-based options, and by supporting initiatives such as community gardens, and partnerships with local producers. Create education opportunities that promote the health and environmental benefits of eating plant-based and low-carbon foods.

Part 2

ELEMENT 3:

WASTE REDUCTION AND DIVERSION

Element 3: Waste Reduction & Diversion

As the local landfill is operated by the County Solid Waste Department, this element is also related to Part 1 of the Climate Action Plan. While the management of the landfill is a function of La Crosse County's operations, most of the waste disposed and at the landfill and most associated GHG emissions are produced by members of the public. Reducing and diverting residents' waste from the landfill will significantly reduce local GHG emissions and extend the life of the public landfill. La Crosse County Solid Waste handled 135,729 tons of waste in 2023, which is 10.1% more than the 2007 total and 1.4% higher than the 2022 total (Olson, 2024).

County Landfill and Waste Services

Primarily serving La Crosse, Buffalo, Trempealeau, Houston (MN), and Wabasha (MN) counties, and many other cities, towns, and villages, the La Crosse County Landfill plays a vital role in local solid waste management. According to the La Crosse County Community Sustainability Plan Survey (see Appendix E), 62.58% of town residents receive information regarding recycling and waste reduction options from the Annual Municipal Newsletter.

La Crosse County has two primary waste management companies: Harter's Quick Clean-Up and Hilltopper Refuse and Recycling. Town survey results indicate that 69.46% of town residents utilize trash pickup services as their primary method of trash disposal (see Appendix E). A third company, Waste Management, also operates in the area, hauling commercial waste and recycling. Harter's Quick Clean-Up and Hilltopper Refuse and Recycling offer a range of trash and recycling services within the county:

- Harter's Quick Clean-up provides curbside trash and recycling pick-up services to the City of La Crosse, City of Onalaska, Town of Campbell, Town of Medary, Village of Bangor, and Village of Rockland.
- Hilltopper Refuse and Recycling provides curbside trash and recycling pick-up to the Town of Onalaska, Town of Barre, Town of Holland, Town of Shelby, Village of Holmen, and Village of West Salem. In areas where curbside pick-up is not available, Hilltopper Refuse and Recycling offers drop-off sites in the Town of Bangor, Town of Burns, Town of Farmington, Town of Greenfield, and Town of Hamilton for residents to take their trash and recycling.

In 2023, 36% of regional waste (85,404 tons), a record total, was diverted from the landfill to be recycled or sent to Xcel Energy where it's processed into refuse-derived fuel (RDF). The partnership began in the 1980's and serves as an early example of La Crosse County's sustainability initiatives. More recent sustainability efforts include the establishment of a hauler rebate program aimed at enhancing waste stream security, a partnership with Gundersen Health

System to convert methane from the landfill into heat and electricity, and the creation of a drop-off area allowing citizens to dispose of a wide variety of wastes, recyclables, and garbage (La Crosse County, 2015a). In 2023, 114, 939,231 cubic feet of gas was extracted from the landfill and use to power nearby Gundersen Health facilities.

Additionally, a Master Land Use Plan has been implemented to provide guidance for future land use decisions at the 350-acre landfill site. The plan's goals center around expanding the landfill's capacity, initiating ecological restoration efforts, and constructing trails for recreational opportunities as provided in the La Crosse County Solid Waste Management Plan (La Crosse County, 2015b). While these are all beneficial endeavors, reducing and diverting waste is crucial to improving La Crosse County's sustainability.

Waste Reduction

Before considering disposal methods, it's important to recognize the environmental impacts of producing new items. The manufacturing and transportation processes associated with new products require significant energy consumption, emissions, and material inputs. To mitigate these impacts, waste reduction and reuse should be prioritized where possible. Borrowing or renting options for items needed for temporary use is one method that can help minimize unnecessary consumption. The Tool Library at the La Crosse Public Library provides residents with access to tools, sewing machines, and more for borrowing, offering an accessible way for individuals to improve and maintain their homes, as well as explore interests and hobbies. Additionally, La Crosse County's Product Reuse Room offers a diverse range of household products such as wood stains, insecticides, herbicides, and more, all available for public use.

Water Waste

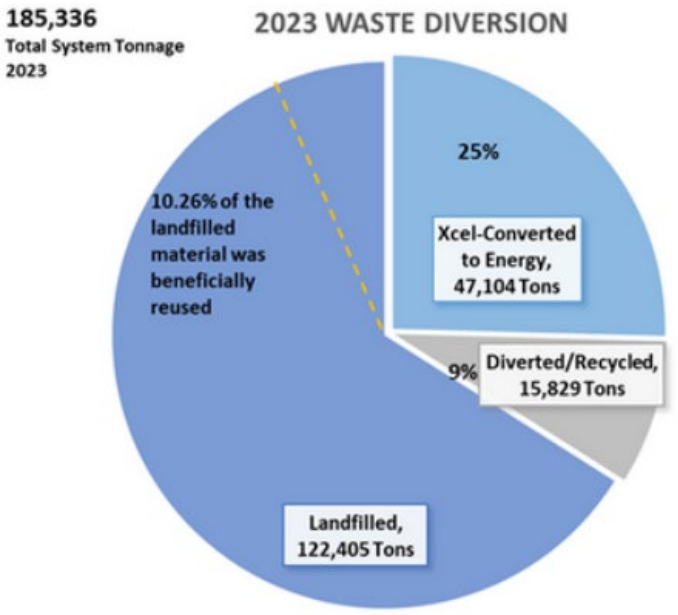
Conserving water and prioritizing efficiency are also important aspects of waste reduction. Water is critical to supporting different aspects of the community, including public health, recreational activities, and economic endeavors such as agriculture and energy production. Addressing water leaks and investing in water-efficient appliances can lead to significant water savings and financial benefits in the long run. It's worth noting that seemingly minor issues like leaky faucets, showerheads, and toilets can collectively waste significant amounts of water. In fact, more than 10% of homes have leaks that collectively squander over 90 gallons of water each day (Wisconsin DNR, n.d.a.). Moreover, inefficient irrigation methods and systems contribute significantly to water loss in landscaping and outdoor activities. It's estimated that as much as 50% of water used outdoors is lost due to factors such as wind, evaporation, and runoff. A household with an automatic landscape irrigation system that lacks proper maintenance and operation could waste up to 25,000 gallons of

water annually (EPA, 2024). In Wisconsin specifically, frequent lawn watering is often unnecessary. While some watering can be beneficial to prevent weed growth and mitigate soil erosion, many grass species commonly used in the region, such as Kentucky bluegrass, are highly resilient and can survive droughts lasting two to three months (University of Wisconsin-Extension, 2011).

Waste Diversion

In addition to waste reduction, diversion is necessary in reducing the materials that are sent to landfills. The landfill's RDF agreement with Xcel Energy is an effective example of local waste diversion. In 2022, 35,100 tons (26.2%) of waste was successfully diverted from the landfill to create 22,100,000 kW of energy, which is enough to supply 2,428 households (Olson, 2023). In 2023, diverted waste increased to 47,104 tons (25% of total system tonnage) (Figure 12). The Solid Waste Department is the only facility in Wisconsin that operates, through partnerships, both waste-to-energy and gas-to-energy programs.

Figure 12. Source: 2023 La Crosse County Solid Waste Department Impact Report.



Food waste comprises a significant amount of landfilled waste. Food waste in the U.S. is responsible for the following:

- GHG emissions equivalent to those of more than 50,000,000 automobiles annually (Krause, et al., 2023).
- 58% of fugitive methane emissions from landfills are from food waste (Krause, et al., 2023).
- 61% of methane from landfilled food waste escapes before collection systems can capture them, as food breaks down quickly (Krause, et al., 2023).

Composting serves as an additional method of effective diversion of food waste in particular. Whether through large commercial-scale operations or individual home setups, composting involves converting organic waste into a fertilizer that enriches and improves soils. For every million metric tons of organic waste that is not reused as compost, approximately 469 metric tons of carbon dioxide equivalent greenhouse gases are released in the form of methane (Project Drawdown, n.d.) Composting can reduce these emissions by more than 50%. Moreover, compost serves as a valuable garden addition. It also provides numerous other benefits, including enhancing downstream water quality by effectively retaining pollutants, preventing erosion, and reducing

runoff (Project Drawdown, n.d.). Currently, 51.57% of town residents already compost at home (see Appendix E). Additionally, residents within Harter's service area have access to composting services, which accept materials like fruit and vegetable scraps, paper, and coffee grounds.

In 2022, 15,900 tons (11.9%) of waste were recycled by the La Crosse County Solid Waste Department; an additional 7,860 tons were recycled by other municipal programs in 2021 (Olson, 2023). Materials recycled in 2023 by the Solid Waste Department are summarized by Figure 13. Recycling offers significant environmental benefits by reducing the strain on manufacturing from non-renewable resources and decreasing greenhouse gas emissions. However, a challenge in the recycling industry is the lack of understanding about what materials are recyclable in each municipality. While Harter's Quick Clean-Up and Hilltopper Refuse and Recycling have specifications of their own, they largely overlap in what they accept:

- Glass: Jars and bottles only
- Plastic: Bottles of food containers
- Hilltoppers will accept plastics with numbers 1, 2, and 5 on them, and Harter's will accept plastics with numbers 1, 2, 4 and 5
- Tin and aluminum: Bottles, cans, pots & pans, empty aerosol cans, aluminum foil
- Wires: Christmas lights and power cords
- Paper and Cardboard: Newspapers, cardboard boxes, paperback books, phone books

Figure 13. Source: Materials diverted from LCC Landfill in 2023. 2023 La Crosse County Solid Waste Department Impact Report.

Diverted/Recycled Material	Amount in Tons
Shingles	6,918
Concrete and Blacktop	1,476
Wood	2,742
Xcel Metals	2,832
HHM	178
Landfill Metals	340
Tires	198
Yard Waste	172
Mattresses	169
Clean Soil	804

Recyclable materials should also be prepared properly for disposal: all bottles, cans, and food containers should be rinsed and cleaned, and boxes should be flattened. Additionally, soiled food containers such as dirty paper plates, and pizza boxes cannot be recycled. While it cannot be picked up curbside, the La Crosse County Landfill does accept Polystyrene (Styrofoam) foam for recycling. According to the La Crosse County Community Sustainability Plan Survey (see Appendix E), 73.58% of town residents utilize recycling drop-off. Additional items that are accepted by the county landfill for recycling or diversion include tires, mattresses, and freon items such as air conditioners, dehumidifiers, refrigerators. Additionally, while yard waste pick-up and drop off options vary between municipalities, it can be dropped off at the county landfill in biodegradable bags year-round. It's essential to note that burning trash is not an acceptable disposal method as it is damaging to the environment
and has the potential to cause long-term health problems (Wisconsin DNR, n.d.b).

For materials that cannot be disposed of through recycling or regular trash collection, La Crosse County provides a Hazardous Material Program located at 3202 Berlin Drive in La Crosse, WI. To provide a cost-effective solution to prevent toxic waste from entering the waste stream, appointments are not required for residents unless they have more than 200 pounds of waste. Acceptable materials include automotive fluids, lawn and garden chemicals, and computers. 71.70% of town residents take part in specialized waste disposal or recycling, including use of the Hazardous Material Program (see Appendix E).

As the first iterations of solar panels are decommissioned and more modern solar panels are decommissioned in the future, it will be important to evaluate the environmental impact of their disposal. Most panels consist of recyclable materials such as glass, copper wire, an aluminum frame, polymer layers, and plastic. The adhesives used to seal panels together often make taking panels apart very challenging. Other components, such as silver and internal copper, are used in a relatively small capacity but can be more difficult to recycle. Some also contain toxic materials such as lead and cadmium. Additional barriers include the cost, and availability of suitable recycling facilities. As an alternative, they can often be reused or refurbished, particularly for things such as vehicle charging stations or other options that are not tied to the electrical grid (EPA, 2023). As technologies continue to progress, it will become easier to recycle solar panels and batteries. As advancements in both material science and recycling technology continue, the future of sustainable solar panel disposal and repurposing is promising.

Figure 14. Source: La Crosse Tribune.

Waste Reduction & Diversion Goals & Recommended Actions

The Solid Waste Department serves multiple surrounding counties, and this element relates to several functions of the Solid Waste Department. Implementation of this section's recommended actions may apply beyond town boundaries.

Goal 1: Share waste disposal programs and County sustainability efforts with the public to increase access and awareness.

- Action 1.1. Increase public awareness of waste drop off sites in the towns and their regulations through education and outreach. Organize and standardize the system of municipal drop-off sites. Implement consistent guidelines, operational hours, and accepted materials across all sites to streamline user's experience. Develop clear signage and user-friendly instructions at each site.

- Action 1.2. Establish an interpretive center at the current landfill office and provide interpretive signs, displays, materials and programs to explain the ecology of the planned restoration of prairies, savannas, and woodlands.
- Action 1.3. Communicate information on waste reduction, recycling, and organics collection options available for residents. This information should be collected from, and based on, content shared by regional waste collecting, recycling, composting, and reuse organizations. Models include the City of Portland's Be Cart Smart, and the City of Fayetteville's Solid Waste Diversion and Recycling Education Plan.

Goal 2: Develop new strategies for recycling and waste diversion to maximize the operational life of the La Crosse County Landfill.

- Action 2.1. Establish a "repair cafe" periodically at the landfill to provide community members with a space to bring broken items and receive assistance with repairs. These cafes will offer tools, materials, and volunteer experts who can help repair a variety of items, such as electronics, clothing, furniture, and household appliances. Determine feasibility of partnership and consolidation of multiple services to minimize impacts to carbon footprint.
- Action 2.2. Promote partnerships with local thrift stores and Habitat for Humanity to increase resource reuse. These collaborations can include joint donation drives, and coordinated efforts to repurpose and resell household items, building materials, and furniture.
- Action 2.3. Facilitate the recycling of refrigerants and refrigeration equipment by establishing accessible recycling programs.
- Action 2.4. Establish a demolition materials facility to divert more demolition materials from being landfilled. Collaborate with municipalities to develop a construction and demolition waste management ordinance aimed at increasing the recycling of waste materials. Include deconstruction inspection as part of the demolition requirements for residential and commercial buildings. Remaining construction and demolition waste will be directed to the County facility for proper disposal.
- Action 2.5. Offer technical assistance and evaluate ways to expand the County's successful single stream recycling program.
- Action 2.6. Ensure community-wide access to composting sites. Consider providing a curbside collection composting service. Promote the use of existing composting programs and facilities.

Goal 4: Analyze landfilled waste to better understand local waste streams.

- Action 4.1. Perform a study to determine how much waste could be diverted from the landfill for combustion by Xcel Energy.
- Action 4.2. Develop a waste audit and diversion assistance program, helping businesses establish tracking and reporting waste streams; identify reduction, diversion, and beneficial use opportunities; and identify financing to improve businesses' bottom-line.

- Action 4.3. Partner with waste haulers to inventory town recycling drop off tonnages. Explore ways to increase recycling participation and capacity.
- Action 4.4. Conduct a feasibility study on implementing 'landfill mining' to divert more waste and generate recycling revenue. This study should analyze the composition and characteristics of landfill waste, potential environmental impacts, technological requirements, and economic viability.

Part 2

ELEMENT 4:

ENERGY EFFICIENCY AND RENEWABLE ENERGY

Element 4: Energy Efficiency & Renewable Energy

According to Project Drawdown, 25% of global GHG emissions originate from energy generation and another 6% comes from buildings (Project Drawdown, 2021). By weatherizing buildings for temperature extremes and electrifying building heating and cooling, energy efficiency increases, and emissions from buildings can be reduced. Decarbonizing national energy production by replacing coal and natural gas with renewable energy generation is a realistic way to significantly mitigate 25% of the emissions contributing to climate change. Many of the United States' fossil fuels are non-domestic, so increasing renewable energy generation saves Americans money and increases our national security and independence.

In 2023, usage of electricity and natural gas usage in La Crosse County generated 688,697 metric tons of CO2 emissions (Olson, 2024). 51% of the emissions are attributed to electricity, and 49% are attributed to natural gas. 53% of the total emissions were generated by users in the City of La Crosse.

Energy Efficiency

The primary energy provider in La Crosse County, Xcel Energy, aims to stop burning coal by 2030, however, natural gas will remain a substantial part of its portfolio of fuel sources. From 2005 to 2021, Xcel Energy reduced coal consumption in its upper Midwest plants from 51% to 18% of its total fuel use and increased natural gas from 5% to 22% of its total fuel use (Xcel, 2022). CO2 emissions from natural gas in Wisconsin increased by 65.8% from 2010 to 2020 (Public Service Commission of Wisconsin, n.d.). Xcel Energy has published its decarbonization plan to become a carbon neutral electricity provider by 2050.

Xcel Energy delivered 89% of the natural gas used by residents in 2023. WE Energies provided 7%, and Midwest Natural Gas provided 3% of the known total (Olson, 2024). Xcel Energy provided 56.3 million therms of natural gas, which is 8.3% less than provided 2022 but 6.2% more than provided in 2015 (Olson, 2024).

While the carbon footprint of home energy use may start declining, energy efficiency still plays a vital role in reducing climate impacts today in addition to lowering energy costs and increasing comfort. There are numerous ways that residents and business owners can increase their energy efficiency that will lead to long-term cost savings. When looking to replace lighting, LEDs are more efficient and last much longer than any other method of home illumination. Heating and cooling are the largest residential electricity use. 64.6% of Wisconsin housing units are heated with utility gas and 12.1% are heated with bottled, tank, or LP gas (Public Service Commission of Wisconsin, n.d.). In new construction or renovation, heat pumps provide a more efficient alternative than gas. Heat pumps boast higher energy efficiency than traditional gas furnaces, and modern heat pumps are more than capable of functioning under

Wisconsin's cold winters (Department of Energy, n.d.). The first step to any energy efficiency upgrade is to perform an energy audit of your home or business to identify problem areas that are costing you on your utility bill and identify the most cost-effective energy upgrades.

Renovating existing buildings produces far fewer emissions than constructing new ones. As exhibited by Figure 15, upfront carbon emissions from new home construction are equivalent to 23 years of energy consumed by that building (U.S. Department of Energy, 2023). It's important to reduce these upfront emissions while addressing housing demand to avoid ballooning residential carbon emissions from future home construction. This can be achieved by promoting low-cost and sustainable alternatives in new home construction or residential renovations through incentives or other support programs. Community-wide, buildings consume 40% of the total energy used and could potentially provide the greatest energy reduction across the grid in La Crosse County (Shoemaker, 2023).

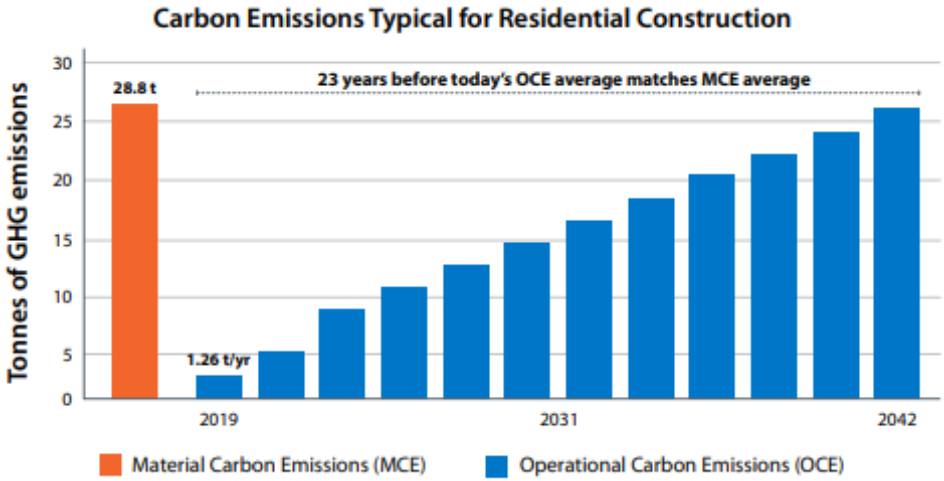


Figure 15. Source: U.S. Department of Energy. (2023, February). New Residential Construction Carbon Emissions. https://www.nrel.gov/docs/fy23osti/83049.pdf

Focus on Energy is a Wisconsin program that partners with utilities to offer residents and businesses rebates and reduced costs for energy efficiency. Weatherization of older structures and modern appliances for improved energy efficiency is a particular priority for Focus on Energy. La Crosse County's webpage has compiled a list of resources that are available to La Crosse County residents, including links to Focus on Energy programs (Sustainability Resource Links (lacrossecounty.org)). Residents, rental property owners, and business owners are encouraged to take advantage of the resources made freely available to them to reduce their energy costs. From 2020 to 2024 residents of La Crosse County (including the City of La Crosse) saved the following on their energy bills by utilizing Focus on Energy programs:

- Residential: $2,085,372
- Business: $2,877,879
- Renewables: $1,016,835
- **Total: $4,963,251**

Across all residential and business sector energy efficiency projects leveraging Focus on Energy programs from 2020 to 2024, 53,284,357 kWh of electricity and 1,451,728 therms of natural gas were saved. During that period, La Crosse County residents achieved more savings than some large counties across the state with more than twice La Crosse County's population. This may be mostly attributed to local embrace of renewable energy. Completion of renewable energy projects in the county from 2020-2024 that leveraged Focus on Energy programs resulted in **23,906,837 kWh** of electricity savings**.**

Electricity Demand

Energy use in La Crosse County has been consistent since 2015. In 2023, residents received 88.9% of their power from Xcel Energy, with Riverland Energy Cooperative (9%) and Bangor Municipal Utility (2.1%) providing the rest (Olson, 2024). 61% of energy used in La Crosse County occurred in the City of La Crosse.

Figure 16. Wisconsin Energy Use by Economic Section 2020 (Trillions of Btu). Source: Wisconsin Public Service Commission (PSC) Energy Statistics Portal https://maps.psc.wi.gov/portal/apps/experiencebuilder/experience/?id=fb6e6305e53e437eaa958f91246ec007&page=page_12&views=view_77

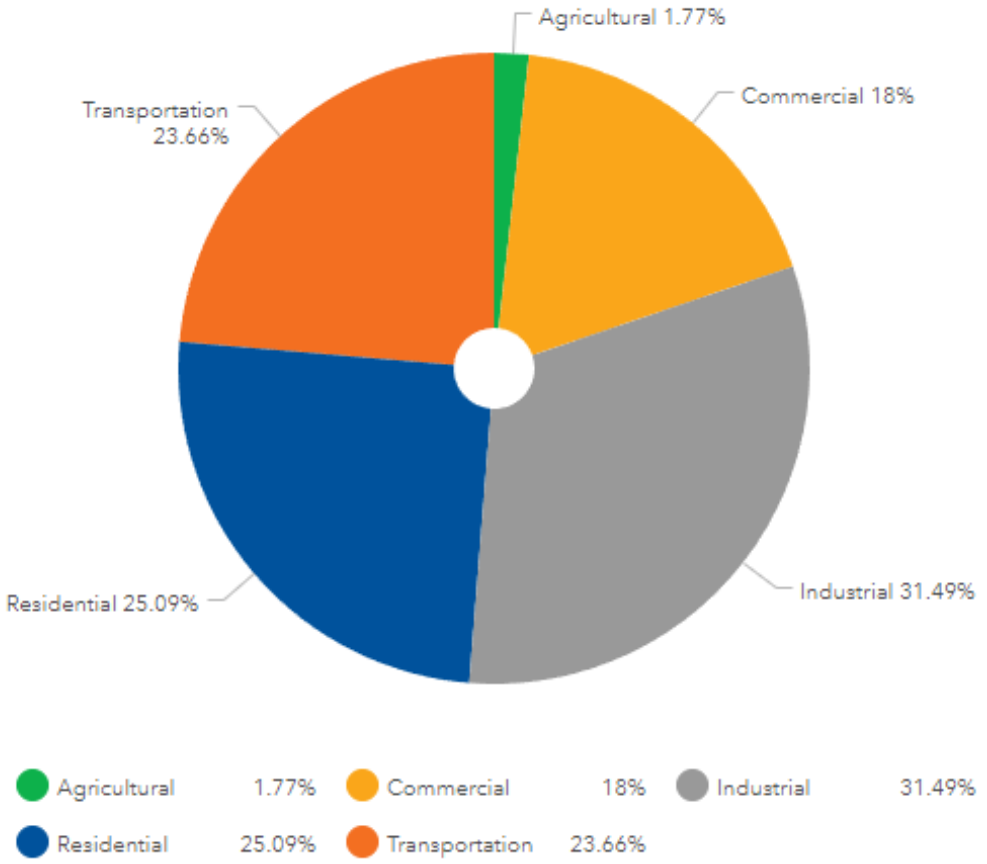


Figure 16 represents Wisconsin energy use by economic sector in 2020. As data centers and industrial uses expand, the residential sector could cease to be the leading consumer of electricity in the United States, and industrial is already the highest consumer of electricity in Wisconsin. Figure 17 represents U.S. electricity retail sales to major end-use sectors and electricity use by all sectors 1950-2022. In 2022, electricity demand was 14 times greater than it was in 1950, even with the increased efficiency of modern buildings, appliances, and energy transmission (U.S. Energy Information Administration, 2023). Electricity use in the U.S. is projected to increase in all major energy use sectors through 2050 (U.S. Energy Information Administration, 2023).

Increasing National Demand & Data Centers

While many utilities have prioritized carbon neutrality, many others are not prepared to satisfy increased demand from electricity due to increasing populations, electrification of buildings and transportation, and increased electricity consumption in general. Expansion of large data centers, crypto currency mining, industrial/manufacturing expansion, and artificial intelligence (AI) will exacerbate potential shortages of electricity. By 2028 data center electricity use is projected to be 6.7% to 12% of all electricity use in the United States (Shehabi et al., 2024).

A primary reason the grid may struggle to keep up with increased electricity consumption is because funding cuts have slowed electricity transmission line expansion by 75% since 2013 (Halper, 2024). Between 2018 and 2023, data center energy use doubled (Shehabi et al., 2024). 2,700 data centers consumed 4% of the energy used in the U.S. in 2022 (Halper, 2024). Data centers also consume a significant amount of water, and 10-20% of total data center energy consumption is related to AI (Chow, 2014). Demand for electricity from AI is projected to increase ten-fold from 2023 to 2026 (Hodgson, 2024).

Partly due to the power crunch caused by large data centers, and the burden they place on other ratepayers, several states are reducing incentives for attracting large data centers (Halper, 2024). A significant amount of workforce will be in demand to assist in modernizing the nation's infrastructure and electrical grids to handle large data centers and AI so demand for electricity from the rest of the country can be met. While AI may at times increase grid demand, it may also be used to improve grid efficiency by adapting energy supply to demand using automated recognition of electrical use patterns.

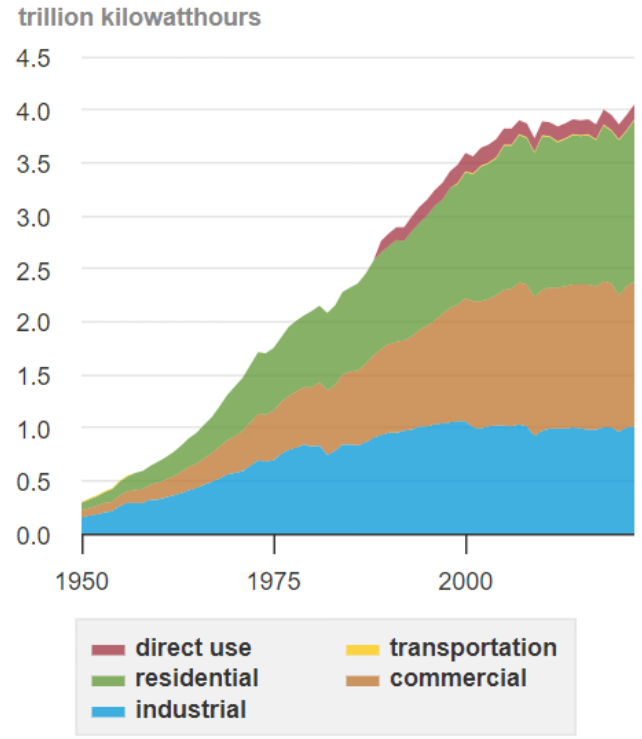


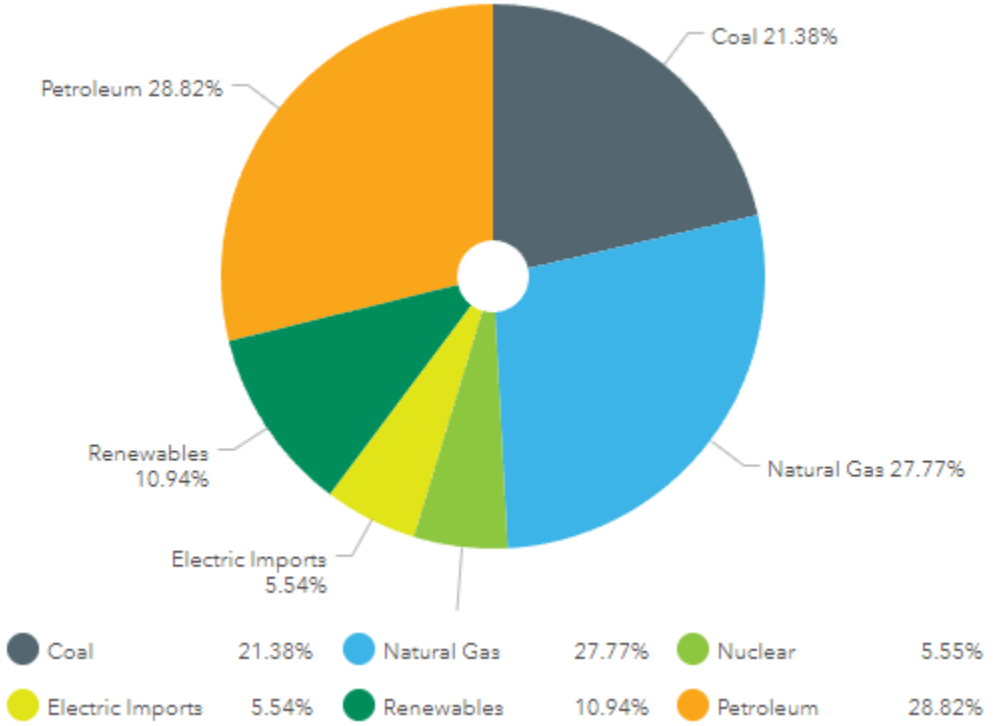
Figure 17. U.S. electricity retail sales to major end-use sectors and electricity use by all sectors 1950-2022

Renewable Energy

Adoption of renewable energy technologies supports domestic green industries, increases local and national security, and reduces the Unites States' dependence on volatile international markets for environmentally impactful fossil fuels. The U.S. consumes more petroleum than any other country in the world. In 2022, the U.S. purchased 35% of crude oil that is processed abroad for use by buildings and transportation (Elbein, 2022). In 2020, most of the US's imported oil came from (Wolf, 2022):

- Canada – 52.5%
- OPEC Nations (Iran, Iraq, Kuwait, Saudi Arabia, & Venezuela) – 11%
- Mexico – 9.6%
- Russia – 6.6%

Figure 18. Wisconsin Resource Energy use by Source, 2020. Source: Wisconsin Public Service Commission (PSC) Energy Statistics Portal https://maps.psc.wi.gov/portal/apps/experiencebuilder/experience/?id=fb6e6305e53e437eaa958f91246ec007&page=page_12&views=view_77



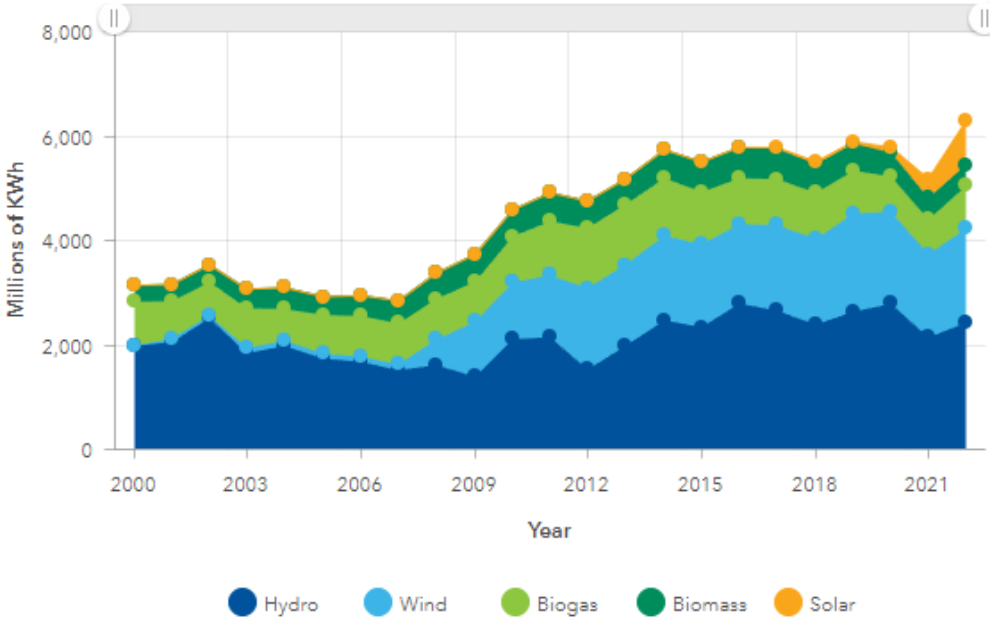
Wisconsin's resource energy use by source in 2020 is represented in Figure 18. Only 10.94% of total energy use in Wisconsin in 2020 was considered renewable. Figure 19 represents Wisconsin renewable energy electricity generation by type of fuel 2000-2022 (Millions of kWh).

Solar energy production has increased in Wisconsin in recent years, and other forms of energy have been or will be evaluated in the future as renewable energy technologies develop. Historically, hydroelectric power has been utilized in the region, for example at the Angel Dam along the La Crosse River. In 2022, 38.62% of renewable energy in Wisconsin was hydroelectric (Public Service Commission of Wisconsin, n.d.).

While renewable wind energy conversion systems (WECS), also referred to as wind turbines, have been constructed across the Midwest for over a decade, most of the topography of La Crosse County likely isn't suitable for large-scale WECS. In 2022, 28.68% of Wisconsin renewable energy was wind energy (Public Service Commission of Wisconsin, n.d.). Solar, for the time being, is the most cost-effective, cleanest renewable energy option to focus on expanding.

Dispersed renewable energy generation, like rooftop solar, is an important part of a renewable energy transition. In Wisconsin, there are certain restrictions that prohibit the creation of community renewable energy systems like a community solar garden. For now, the creation of, and benefits from, community solar is controlled by existing utilities and energy cooperatives. However, in recent years there has been momentum at the state level to allow for communities and 3rd party solar installers to operate community solar projects separate from utility-owned power generation (WPR, 2024). Community solar would allow individuals, businesses, and entire communities who cannot install panels on their roofs or lack the financing available to afford the installation to contribute to and benefit from local power generation. This would not only benefit residents and businesses, but the grid as well through extra capacity that would support our rapidly electrifying industries.

Figure 19. Wisconsin Renewable Energy Electricity Generation, by Type of Fuel 2000-2022 (Millions of kWh). Source: Wisconsin Public Service Commission (PSC) Energy Statistics Portal https://maps.psc.wi.gov/portal/apps/experiencebuilder/experience/?id=fb6e6305e53e437eaa958f91246ec007&page=page_1&views=view_85%2Cview_20



In addition to producing fewer emission, renewable energy is far more efficient. Energy losses from conversion of non-renewable fuel sources like coal exceeded total energy use in the United States in 2021 (Kirk, 2022). Large-scale solar facilities, constructed by electrical utilities and 3rd party contractors produce many megawatts of energy at single locations. These utility-scale solar projects usually cover 5 to 40 or more acres. In parts of Wisconsin, there are solar "farms" as large as 1700 acres. Instead of relying on solar generation through net-metering compensation to individual private property owners, ground mounted, utility-scale solar generation is preferred by electrical utilities. Similar to WECS projects utility-scale solar is usually built on leased agricultural lands. Wisconsin Statutes sections 66.0401(1m) and 236.292(2) limits local regulation of renewable energy projects. In the future, it is likely a large solar project will be constructed in unincorporated La Crosse County.

As part of the rapid electrification the world is experiencing, battery storage of renewable energy is a vital component to this transition. Many renewable energy sources are not able to produce energy at maximum efficiency all the time and will have to rely on battery storage, charged with excess electricity produced during peak output, to pick up the slack during these down times.

Installation of renewable energy systems is a cost-effective way to eliminate emissions produced by standard methods of electricity production. A quarter of all CO2 emissions in Wisconsin is from home energy use (UW-Stevens Point, 2023). A home that transitions to 100% solar energy could reduce monthly CO2 emissions by 765 pounds per month. Not only is solar energy better for the environment, but it also increases property values. A study completed by Lawrence Berkeley National Laboratory found, on average, solar energy infrastructure increased the value of a home by about $15,000 (DOE, n.d.). Repayment on investment in solar panels, resulting from long-run energy bill savings, for a single family home is typically 10-15 years (EnergySage, 2022). (This figure does not include the existing 30% solar tax credit available at the time of writing that, when included, could lead to a dramatic reduction in payback period and greater savings.) Solar panels typically operate for 30-35 years after installation, meaning that beyond the initial payback period, solar panels continue to operate for 20-25 years contributing to direct savings and energy independence (Department of Energy, n.d.).

Figure 20. A solar photovoltaic energy system being installed at the LCC Law Enforcement Center May, 2024.

Energy Efficiency & Renewable Energy Goals & Recommended Actions

Goal 1: Increase use of low-emission, renewable energy.

- Action 1.1. Coordinate a group-buy program for solar installations, heat pumps, and home electric vehicle (EV) charging stations to offer bulk pricing discounts. Goal: >10 homes annually.
- Action 1.2. Advocate for proactive language for residential and commercial uses within ordinances that reduce ambiguity and streamline the permitting process for renewable energy. For example, add language to the zoning ordinance to specify that ground-mounted solar installations are exempt from being counted towards the estimation of allowed accessory structure size on a property.
- Action 1.3. Support individual and institutional solar energy projects by implementing incentives, providing technical assistance, conducting educational campaigns, and streamlining permitting processes.

- Action 1.4. Support towns in acquiring solar energy systems on town properties by providing technical assistance and incentives.
- Action 1.5. Research and inventory HOA documents and restrictive covenants which illegally restrict the use of solar use in neighborhoods.
- Action 1.6. Evaluate the feasibility of partnering with farmers and local utilities to create a manure biodigester cooperative that reduces methane emissions, significantly improves the nutrient uptake speed of manure spreading, reduces risk of surface water contamination, financially supports local farmers, assists farmers with WDNR nutrient management compliance, and produces energy for the community.

Goal 2: Improve building energy efficiency, lower energy bills, and reduce emissions from building energy use.

- Action 2.1. Establish a sustainability resource work group for builders and HVAC companies to collaborate on sustainable building practices, energy-efficient HVAC systems, and renewable energy integration.
- Action 2.2. Promote weatherization grant programs to increase public awareness and participation.
- Action 2.3. Promote use of Focus On Energy programs, such as its home energy rebate program. Establish a small local grant program to promote home energy efficiency upgrades, including HVAC/heat pumps, weatherization, efficiency windows, insulation, electric stoves, and electric panel upgrades.
- Action 2.4. Communicate available energy efficiency incentives to residents, focusing on low-income and minority residents. Contract with an organization to reduce the cost for low-income residents to receive professional home energy audits and recommendations for energy use reduction and monitoring. Develop a program to identify and implement measures that increase the durability, safety, and efficiency of their homes. Goal: 10 households annually, each achieving 15% energy use reductions.

Goal 3: Improve the resilience of the electrical grid as climate changes and demand for electricity increases.

- Action 3.1. Work with stakeholders to support utility efforts to modernize the electric distribution grid in the County. Promote green power purchase options, such as those provided by Xcel Energy's "Renewable Connect". Collaborate on promotion and education of available options.
- Action 3.2. Develop a protocol for calculating county-wide GHG emissions. The County should develop a baseline for these emissions as soon as possible and then track the emissions to estimate the emission reductions resulting from initiatives.
- Action 3.3. Address issues with energy time-of-use/availability at peak usage by increasing storage capacity. Help property owners address hurdles to implementation of energy storage infrastructure including collaboration to develop incentive programs and permit streamlining if determined to be a significant constraint. Explore partnerships with US Department of Energy, NREL, LNBL, SolSmart and other resources.
- Action 3.4. Pursue US Department of Energy or Wisconsin Public Service Commission Funding to complete a comprehensive rural energy plan, renewable resource planning, and building energy audits for towns interested in reducing their energy bill and improving resilience.

Part 2

ELEMENT 5:

LAND USE AND TRANSPORTATION

Element 5: Land Use and Transportation

Land Use

In the early days of 20th century environmentalism, solid waste management and pollution reduction were top priorities. In the 1970's, climate change was not a primary motivation to pass impactful federal legislation, such as the Clean Water Act and Clean Air Act. Presently, energy efficiency and electrification of buildings and transportation have become areas of emphasis in efforts to improve sustainability globally. In the future, land use will become a heightened concern, as uncoordinated land use and infrastructure planning is a root cause of many of the largest contributors to climate change. Land use refers to the way humans occupy land and shape their built environments and communities. Land use, and the policies that control land use, are in some way related to many sources of carbon emissions, such as transportation and energy generation.

"Smart Growth" planning principles should be followed to promote sustainable development in areas that are anticipated to experience growth: Smart growth principles, listed below, are the framework of the most sustainable development of human-occupied environments (EPA, 2024).

1. Mix land uses.
2. Take advantage of compact building design.
3. Create a range of housing opportunities & choices.
4. Create walkable neighborhoods.
5. Foster distinctive, attractive communities with a strong sense of place.
6. Preserve open space, farmland, natural beauty, & critical environmental areas.
7. Strengthen & direct development towards existing services.
8. Provide a variety of transportation choices.
9. Make development decisions predictable, fair, & cost effective.
10. Encourage community & stakeholder collaboration in development decisions.

Land use policy, often in the form of zoning and subdivision ordinances, dictate whether the built environment is low or high density, what land uses can occur where, whether certain modes of transportation are available to certain uses, and how developments can alter natural environments. To encourage

smart growth, planning and zoning staff use the following instruments to mitigate land use conflicts and help communities achieve the goals and visions established in their community plans:

- Local ordinances & knowledge of state statutes.
- Boundary agreements.
- Public engagement.
- Deed restrictions.
- County and town plans.
- Future land use maps.

La Crosse County contains more than 300,000 acres, nearly 70% of which is agricultural or natural cover. Alongside the majority agricultural and rural makeup of the county is a relatively dense metropolitan area. County-wide housing density is approximately 100 homes per square mile with much lower density in the county's more rural towns including Washington, Burns, and Bangor at less than 10 homes per square mile (640 acres). The La Crosse County Comprehensive Plan, *Envision 2050,* provides guidance regarding changes to zoning and other regulating ordinances related to land use.

By almost every measure, infill development, or redeveloping existing urban areas, is one of the most sustainable land use practices communities can prioritize. Developing and growing communities laterally, rather than vertically, causes several negative, cascading effects. "Sprawl" is a term often used to summarize these effects, which include, but are not limited to:

- Incurring huge costs to existing residents to expand road, water, storm sewer, and sanitary sewer service areas.
- Increased emergency services response times.
- Increased impervious surface areas that increases flooding.
- Destruction of farmlands.
- Destruction of natural habitats.

A cost of services analysis performed in La Crosse County in 2012 found that for every dollar spent on infrastructure to serve new residential lots larger than half an acre in size, municipalities lost 12 cents on every dollar spent. With increased density per acre comes increase savings to taxpayers. Increasing ratepayers and tax base on existing infrastructure is fiscally responsible. The sanitary districts in the unincorporated areas (Maple Grove, St. Joseph's Ridge, Mindoro) have capacity to increase ratepayers and households on their systems and reduce the cost burden existing residents face to maintain current utility systems.

Most of the zoning ordinance, besides its farmland preservation policies, have been in place since before 1993. Farmland preservation zoning standards, adopted in 2012, have preserved 14,251 acres from future development. Between 2007 and 2023, the amount of agricultural land in La Crosse County has

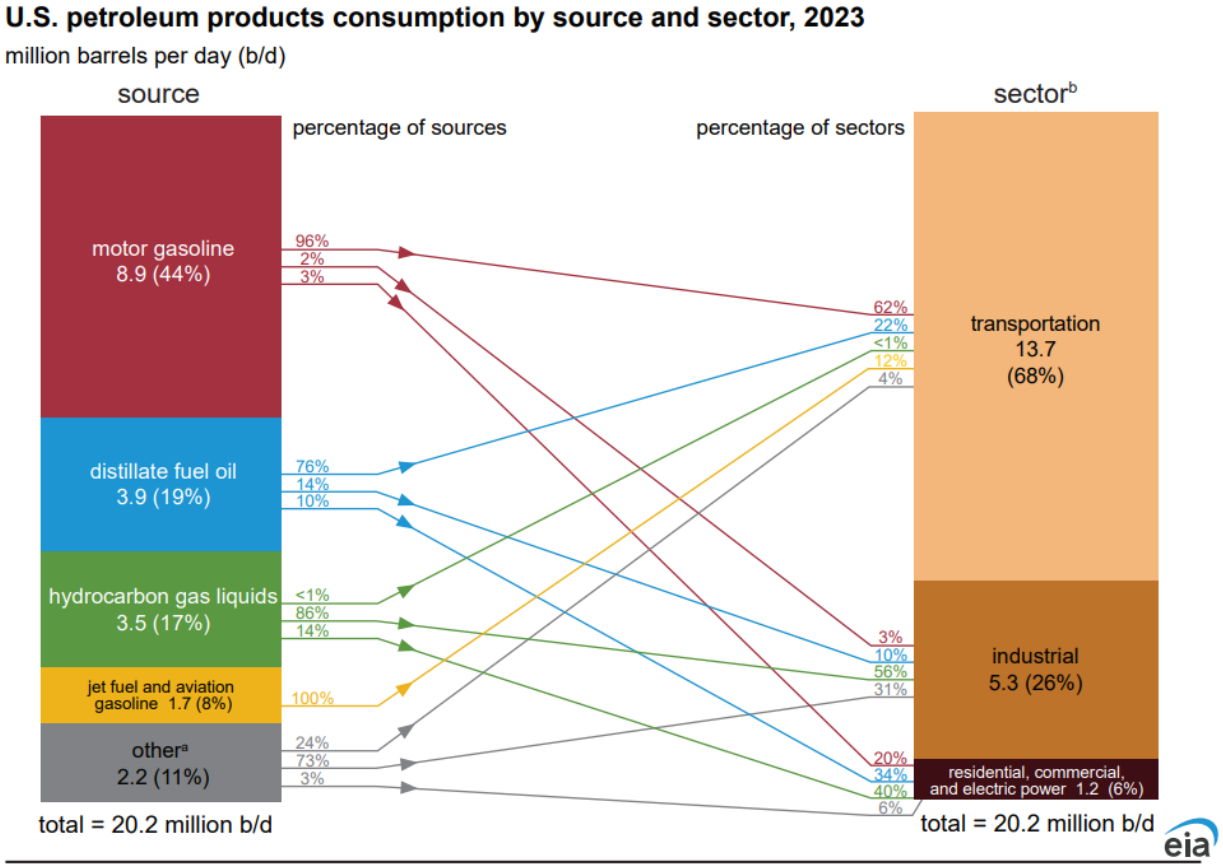
decreased by 4.5% (Olson, 2024). Farmland preservation and limiting urban sprawl are the highest priorities of the La Crosse County Zoning, Planning, and Land Information Department. The La Crosse County Comprehensive Plan and Farmland Preservation Plan found development intensity and density in the unincorporated areas is highest in "urban fringe"/suburban areas close to incorporated areas. More sustainable densities are also located near various river/lakeshores, some major road corridors, and in some rural areas experiencing newer subdivision development. Low density developments on parcels larger than 20 acres are often located within agricultural areas. Annexation by incorporated communities will have an impact on existing land use, densifying development at the fringes of urban areas.

One third of global greenhouse gas emissions are directly or indirectly related to urban sprawl (Mehaffy, 2015). Increases in emissions related to inefficient land use result from increased car dependency, emissions from construction, energy inefficient new buildings, destruction of farmlands, and destruction of carbon sinks. Even though dense, mixed-use developments can be more sustainable, more affordable, and result in more active lifestyles, 75% or more of American cities' developable land is zoned exclusively for low density, detached, single family homes (Badger & Bui, 2019). Generally, locating trip origins (usually residential households) closer to trip destinations (places of employment, commercial businesses, recreation, etc.) reduces infrastructure costs and emissions.

Encouraging compact development reduces the cost of municipal infrastructure and services, reduces individual tax burden, and reduces emissions. One study found that the U.S. can decrease emissions by 70 million tons of carbon dioxide equivalent by 2033 by enacting state-level land use reforms that encourage compact development (RMI, 2024). In Wisconsin, state-level land use reforms based in Smart Growth principles could reduce per capita vehicle miles traveled by 1.6% per year and reduce per capita annual emissions by 215 kg of CO2 equivalent (1.3 metric tons of CO2 equivalent total statewide) (RMI, 2024). The study found that half of the emissions reduced would be a result of decreased burning of fossil fuels for transportation, and another third of projected emissions reductions would be due to reduced vehicle manufacturing and oil production (RMI, 2024).

Transportation

The United States consumes more petroleum than any other country in the world, and 68% of its petroleum consumption was by the transportation sector in 2023 (Figure 21). As early as 1965, the American Petroleum Institute (API) was aware that the burning of fossil fuels would negatively impact global climate. A report of API 1965 Proceedings, a section from annual meeting sessions entitled *Meeting the Challenges of 1966* states, "*One of the most important predictions of the report is that carbon dioxide is being added to the earth's atmosphere by the burning of coal, oil, and natural gas at such a rate that by the year 2000 the heat balance will be so modified as possibly to cause marked changes in climate beyond local or even national efforts… pollution from internal combustion engines is so serious, and is growing so fast, that an alternative nonpolluting means of powering automobiles, buses, and trucks is likely to become a national necessity*" (Ikard, 1965).



Data source: U.S. Energy Information Administration (EIA), *Monthly Energy Review* (April 2024), Tables 3.5, 3.7a, 3.7b, and 3.7c.
Note: Sum of components may not equal total due to independent rounding. See "Extended Chart Notes" on next page.
[a] Includes asphalt and road oil, aviation gasoline blending components, lubricants, kerosene, petrochemical feedstocks, petroleum coke, residual fuel oil, still gas (refinery gas), special naphthas, waxes, unfinished oils, and miscellaneous products. Also includes renewable fuels, excluding fuel ethanol.
[b] Industrial, commercial, and electric power sectors include primary energy consumption by combined-heat-and-power (CHP) and electricity-only plants in the sector.

Figure 21. Source: United States Energy Information Administration (EIA). https://www.eia.gov/totalenergy/data/monthly/pdf/flow/petroleum_2023.pdf

Sprawling development often makes residents dependent on personal automobiles as a primary mode of transportation to reach destinations. Urban sprawl is estimated to cost the U.S. economy more than $1 trillion per year, primarily due to personal transportation and infrastructure costs (Fitzgibbon &

Daniels, 2015). More compact developments that mix residential and commercial uses provide residents with the choice to walk or cycle to their destination. The availability of transportation mode choice can:

- Save residents money on vehicle maintenance.
- Reduce traffic congestion.
- Improve health.
- Reduce pollution.
- Reduce social isolation.
- Save taxpayers money on road maintenance.

Improving the connectivity between rural areas and more populated areas with more employment opportunities is important. According to the U.S. Census, 42.3% of people employed in La Crosse County commute from outside of the county to work, and 28.1% of people who live in La Crosse County commute outside of the county to work (Figure 22). La Crosse County will continue to collaborate with neighboring municipalities and local governments to organize alternative transportation for travel in and out of the county.

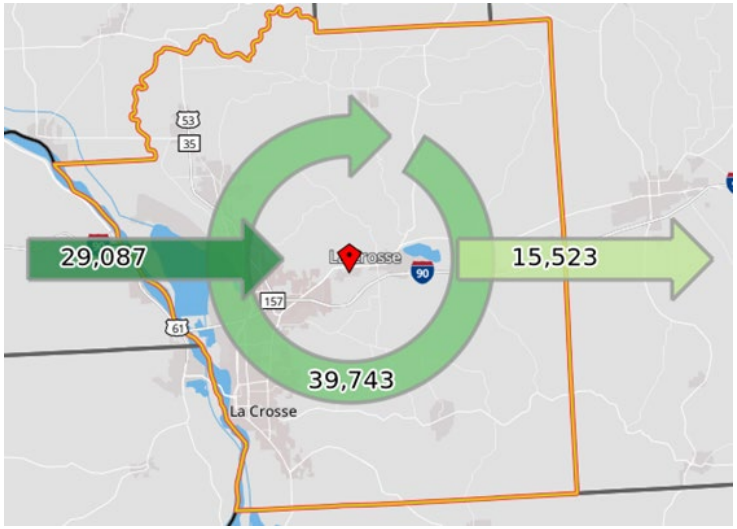


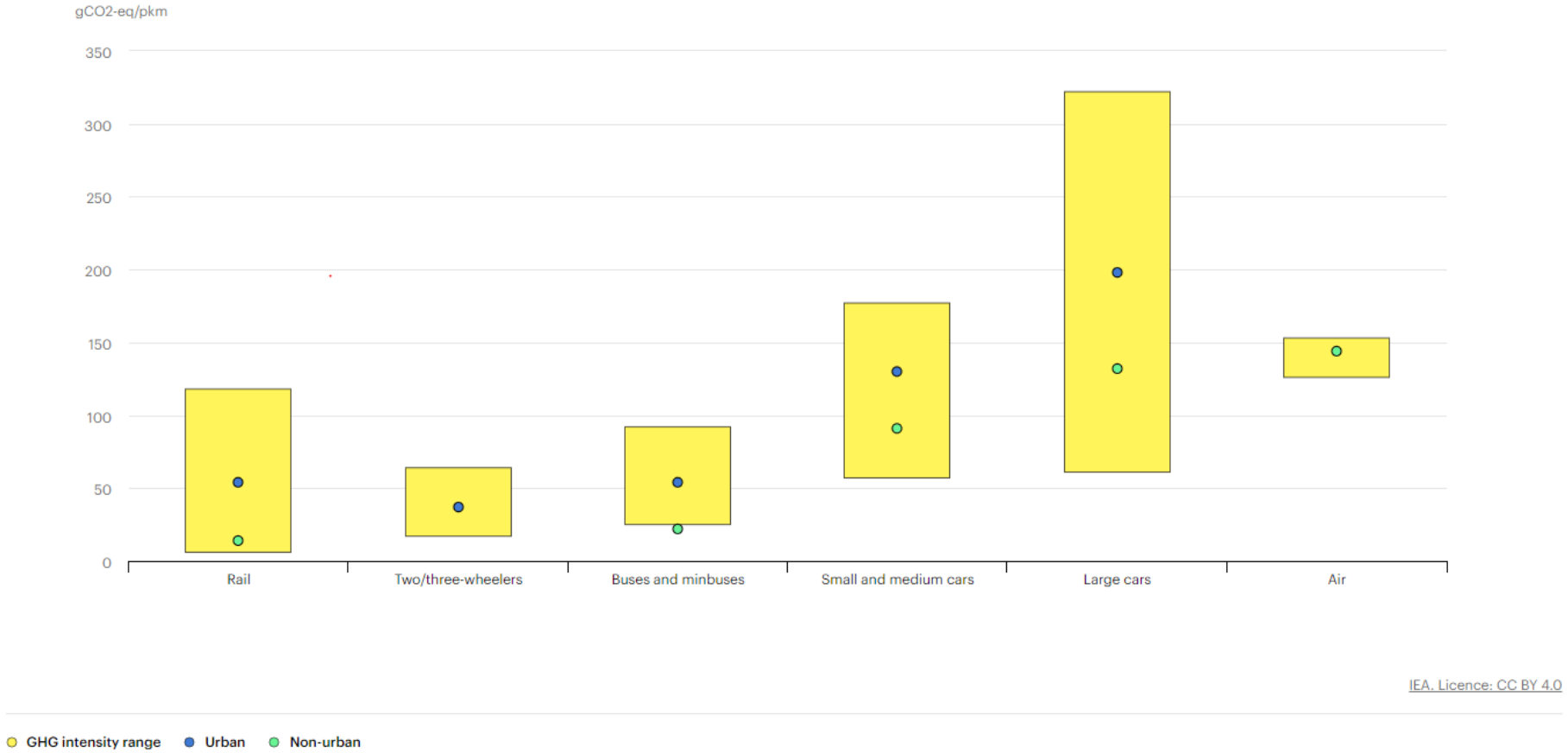
Figure 22. Daily Transportation Inflow-Outflow Map. Source: OnTheMap, U.S. Census. NOTE: Arrows are not indicative of direction and are only meant to illustrate incoming and outgoing commuters.

Automobiles

Personal automobile use has numerous impacts on the local environment in addition to its impacts on atmospheric climate. In the context of La Crosse County's unincorporated rural areas, air and water quality are two ecological factors most affected by fossil fuel powered vehicle use. WisDOT's *System-plan Environmental Evaluation* details potential impacts on water bodies and water sources from transportation, including chemicals in oil, grease, antifreeze, and the maintenance and construction of transportation infrastructure (WisDOT, 2009). These impacts are directly a result of automobile use and find their way into Wisconsin's waterways through surface runoff and infiltration into the soil.

Air quality in Wisconsin is impacted through the emission of particulate matter, ozone, and certain greenhouse gases that aggravate chronic health effects such as asthma, heart and lung disease, and bronchitis. Offering alternative transportation options for residents is the most effective way to reduce the impacts on water and air quality from single occupant vehicles (WisDOT, 2009). Figure 23 represents the GHG intensity or various passenger transport modes. Figure 23 shows that rail, two/three-wheel vehicles, and buses have the lowest GHG intensity in urban and non-urban contexts.

Figure 23. GHG Intensity of Passenger Transport Modes. Source: https://www.iea.org/data-and-statistics/charts/ghg-intensity-of-passenger-transport-modes-2019



Personal vehicle travel made up an estimated 22% of total GHG emissions in the U.S. in 2022 (CBO, 2022). In La Crosse County, vehicular GHG emissions totaled 181,000 tons of CO2e in 2022 (Google Environmental Insights Explorer, 2024). Between 2001 and 2017, the average distance a rural resident in America had to drive to get to work or a shopping center increased by 14-15% (Wilson, K., 2021). The distance that rural residents must drive is not only larger than urban dwellers, but is growing even larger due in part to the consolidation of large employers and the continuation of car-centric transportation planning in most communities nationwide (Wilson, K., 2021). Though, given the rural nature of much of La Crosse County's unincorporated area, alternative modes of transportation may be limited for many residents. It's the personal decision of residents which mode of transportation they elect to use. If alternative modes are provided, use of those modes may be incentivized.

Bus Transit and Rail

A few inter-city or regional public transportation options exist for those living in La Crosse County. SMRT bus serves La Crosse County residents by offering travel options from La Crosse to Prairie du Chien, Viroqua, Tomah, Sparta, and West Salem. SMRT bus primarily serves individuals in these communities to commute to their place of work, reducing rush-hour traffic conditions and demand for parking spaces in the La Crosse metro. It's estimated that a single covered parking stall costs the City of La Crosse ~$35,000 per year in maintenance expenses; shifting ridership to transit saves municipalities money.

La Crosse County is fortunate to receive rail transport services in the form of the Empire Builder Amtrak line that travels through and stops in the City of La Crosse, offering long-distance travel options to the cities that Amtrak serves. A second line, called Borealis, between St. Paul, Minnesota and Chicago, Illinois was added in May of 2024 as part of Amtrak's expansion of rail services in the Midwest. In its first month, 18,500 travelers rode the Borealis.

According to the Fifth National Climate Assessment, there must be a 10% increase in transit use by 2030 to achieve national emissions reductions goals (USGCRP, 2023). To increase transit ridership, transit-oriented development (TOD) land use policies and improved "first mile/last mile connectivity" is necessary.

Active Transportation

28% of Americans' trips are less than 1 mile (US DOE, 2022).

There may be barriers to active forms of transportation such as walking and cycling for many residents who may live far from their place of work and do not have the time to commit to a longer commute. However, 73% of residents of unincorporated areas live within the urban fringe surrounding incorporated municipalities and therefore may have greater accessibility to active transportation options. E-bikes dramatically lower the barrier to entry into active transportation, regardless of existing activity level, and decrease the time required to commute and increase the distance that a rider can comfortably travel in the same amount of time. Residents who would like to explore active forms of transportation, there is an existing network of bike facilities and trails within the county. For instance, the La Crosse River State Trail offers a separated shared use path running East/West through the following cities and villages: La Crosse, West Salem, Bangor, and Rockland before continuing into the state of Wisconsin or La Crescent, Minnesota.

According to the Fifth National Climate Assessment, bike trips and walking trips must each increase by 3% by 2030 to achieve national emissions reductions goals (USGCRP, 2023). 28% of Americans' trips are less than a mile and could easily be walked (US Department of Energy, 2022). In 2021, 52% of trips were 3 miles or less (US Department of Energy, 2022)

Alternative Fuels

Several transportation fuel options are available, including diesel, gasoline, ethanol, compressed natural gas (CNG), and electric. Hydrogen fuel technology is still in development, but it will likely produce more emissions and be less affordable than electric. 98% of gasoline sold in the United States contains 10% or more ethanol, and combustion of U.S. corn ethanol has 44%-52% lower GHG emissions than gasoline (Sarisky-Reed, 2022). With improved agricultural practices and sequestration during fuel production, life cycle GHG emissions from ethanol could be reduced from 40% today to >70% less than a petroleum baseline comparison (Sarisky-Reed, 2022). While many consider biofuels, such as biodiesel and petroleum containing ethanol to be "renewable", combustion of these fuels still produces more tailpipe emissions than electric. Total CO2 emissions from personal internal combustion engine (ICE) vehicles can be compared to CO2 emissions from a typical EV using this tool from the U.S. EPA: Comparison: Your Car vs. an Electric Vehicle | US EPA

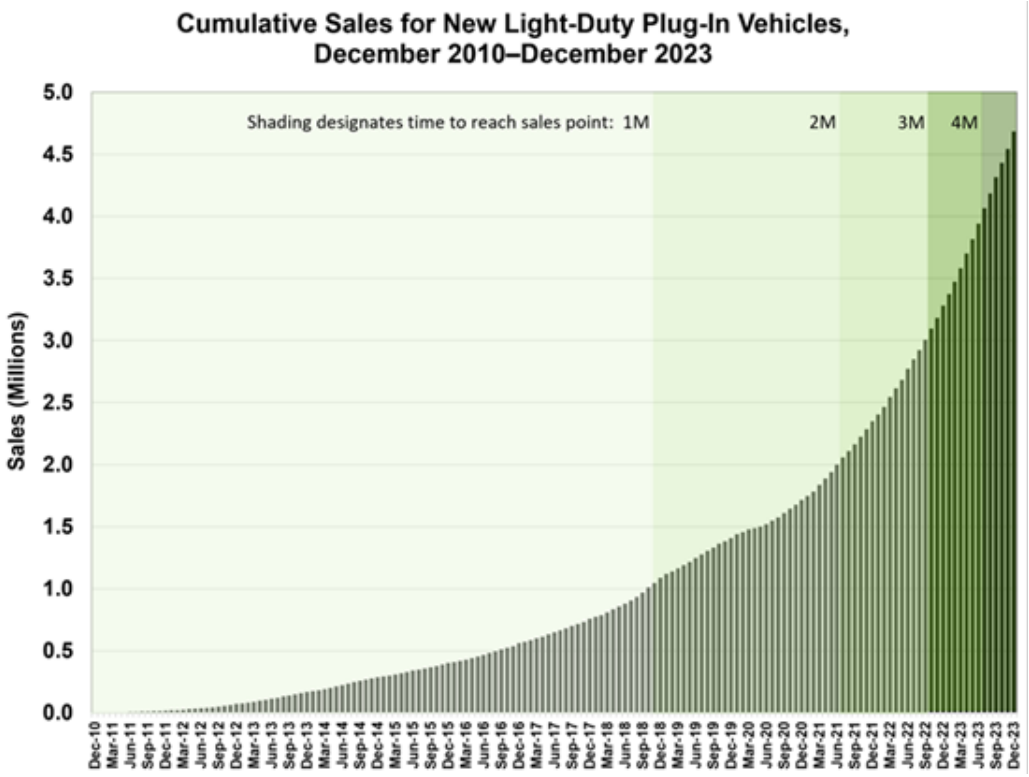


Figure 24. Source: U.S. Department of Transportation.

In recent years, sales of plug-in hybrid (PHEV) and electric vehicles (EV) have increased significantly (Figure 24). PHEVs and EVs are the best carbon-fueled vehicle equivalent replacement for gas powered vehicles, as drivers do not have to sacrifice the convenience of an automobile to reduce their transportation emissions. Understandably the adoption of new EVs may be a financial burden for individuals, however, rural residents are the most likely demographic to

benefit from transitioning to a PHEV or EV because of their greater commute distances. While new EVs are slightly more expensive presently, the more EVs are driven, the more cost effective they can be compared to standard ICE vehicles. PHEVs and EVs have plenty of battery range, even for longer rural commutes. A significant factor in determining savings from switching to electric vehicles is average vehicle miles traveled and the savings from use of electricity rather than fossil fuels (ChargEVC, 2024). Cost savings from long-term EV use is due to their lower cost of fuel and maintenance. At the time of writing, a federal income tax credit up to $7,500 exists for electric, PHEVs, and fuel cell electric vehicles purchases after 2023, depending on several factors (DOE, 2023).

While many non-EV drivers have "range anxiety" and are concerned about the distance an EV can travel on 1 charge, only 2% of American trips are even more than 50 miles (US Department of Energy, 2022). Many modern EV's have ranges of 300 miles or more on a single charge. Over the next several years, the Wisconsin DOT will plan the future implementation of a public EV charging network connecting major corridors throughout the state, enabling greater long-distance mobility and peace of mind for EV drivers (WISDOT, 2024).

Local Population

Population size, density, and projected growth must be considered to identify and understand potential environmental impacts and local sustainability.

2020 Key Demographic Indicators (Esri)	RURAL				
Category	Town of **Bangor**	Town of **Burns**	Town of **Farmington**	Town of **Greenfield**	Town of **Washington**
2020 Total Population (Esri)	660	1,046	2,201	2,255	584
2020 Household Population (Esri)	657	1,044	2,200	2,208	550
2020 Family Population (Esri)	572	888	1,915	1,887	482
2020 Population Density (Pop per Square Mile) (Esri)		21.6	29.2	75.1	16.2
2010-2020 Population: Annual Growth Rate (Esri)	0.69%	0.97%	0.64%	0.89%	0.45%
2025 Key Demographic Indicators (Esri)					
2020-2025 Population: Annual Growth Rate (Esri)	0.60%	0.77%	0.59%	0.66%	0.41%

Table 2

2020 Key Demographic Indicators (Esri)	RURAL / URBAN						
Category	Town of **Barre**	Town of **Campbell**	Town of **Hamilton**	Town of **Holland**	Town of **Medary**	Town of **Onalaska**	Town of **Shelby**
2020 Total Population (Esri)	1,384	4,340	2,603	4,196	1,638	6,140	4,907
2020 Household Population (Esri)	1,378	4,326	2,566	4,196	1,636	6,132	4,820
2020 Family Population (Esri)	1,193	3,294	2,242	3,580	1,426	5,333	3,872
2020 Population Density (Pop per Square Mile) (Esri)	66.9	1,158.00	52.9	103.2	149.2	172.5	196.8
2010-2020 Population: Annual Growth Rate (Esri)	1.13%	0.06%	0.65%	1.23%	1.12%	0.86%	0.39%
2025 Key Demographic Indicators (Esri)							
2020-2025 Population: Annual Growth Rate (Esri)	0.84%	0.06%	0.56%	1.11%	0.84%	1.20%	0.32%

Table 3

2020 Key Demographic Indicators (Esri)	URBAN					
Category	City of **La Crosse**	City of **Onalaska**	Village of **Bangor**	Village of **Holmen**	Village of **Rockland**	Village of **West Salem**
2020 Total Population (Esri)	52,396	18,864	1,426	10,061	709	5,102
2020 Household Population (Esri)	47,457	18,728	1,426	10,043	709	4,869
2020 Family Population (Esri)	27,401	14,919	1,170	8,591	577	3,973
2020 Population Density (Pop per Square Mile) (Esri)	2,553.90	1,863.10	1,163.40	1,935.40	1,214.90	1,492.70
2010-2020 Population: Annual Growth Rate (Esri)	0.20%	0.60%	-0.22%	1.09%	1.74%	0.60%
2025 Key Demographic Indicators (Esri)						
2020-2025 Population: Annual Growth Rate (Esri)	0.14%	0.88%	-0.18%	0.82%	1.16%	0.42%

Figure 25. Source: La Crosse County Comprehensive Plan.

Population characteristics are related to several elements of this plan, including Land Use & Transportation.

Historically, La Crosse County has seen population growth between 10% – 15% in each of the last several decades. Projections indicate the population of La Crosse County will increase by 10,716 residents (8.9%) between 2020 and 2040. A drop in the rate of population increase that was experienced locally in previous decades may be due to decreasing birthrates. Young families are choosing to have less than 2 children on average in recent years. Population growth within suburban towns (Figure 25, Table 2) saw the greatest annual population growth outside of incorporated/urban areas.)

Age and gender are factors that can have a significant impact on the services that are needed or wanted within a community. The median age of a La Crosse County residents is 36.6 years old; slightly lower than the Wisconsin median of 40.4. Approximately 30% of the population (including incorporated areas) is under the age of 20. These numbers are important to note as local agencies consider the demand s on schools and the needs of families.

Climate Migration

Projections of future populations do not account for potential climate migration, which is anticipated primarily from coastal areas that will become inundated with water as polar ice continues to melt during the next century. 20% of land that is currently habitable for humans could be extremely hot by 2070, which means that a third of humanity may live under uninhabitable climate conditions (Cho, 2021).

As many as 216,000,000 people across six continents may be forced to relocate due to changing climate conditions by 2050 (World Bank, 2021).

Drought, sea level rise, wildfires, extreme heat, and hurricanes are predicted to be the leading causes of climate migration. Migration will likely primarily be from sub-Saharan Africa, South Asia, and Latin America, which comprise 55% of the world population (Cho, 2021). Upper-Midwestern communities with milder continental climates are projected to become prime destinations for climate migrants. In the U.S. alone, 13 million or more residents may be displaced by sea level rise (Poon, L., 2020). At this rate, by 2100, 48 Pacific islands will be entirely submerged beneath the ocean (Cho, 2021).

A 2021 report from World Bank, Groundswell II, estimates that as many as 216 million people across six continents may be forced to relocate due to changing climate conditions by 2050 (2021). The report also states that as much as 80% of the anticipated impacts of climate change can be mitigated by immediate climate action. It is difficult to project the impact climate migration will have on La Crosse County, but La Crosse County can expect higher demand for its services. (Kaeding, D, 2023b)

Land Use and Transportation Goals & Recommended Actions

Goal 1: Remove barriers to use of transit and active transportation.

- Action 1.1. Collaborate with the La Crosse Municipal Transit Utility (MTU), Shared Ride, SMRT, and other transit providers to enhance and expand their systems, with a focus on improving transit accessibility, frequency, and coverage across the county.
- Action 1.2. Collaborate with the La Crosse Area Planning Committee (LAPC) to strategically plan and fund enhanced connections for alternative transportation throughout the urban towns, focusing on improving infrastructure for pedestrians, bicycles, and electric vehicles.
- Action 1.3. Develop a public-facing resource that maps all bike routes and pedestrian paths throughout the county.
- Action 1.4. Identify locations for “Park & Rides” in rural parts of the county. Explore feasibility of micro-transit and other solutions for rural community that connect to existing transportation infrastructure.
- Action 1.5. Regularly update Safe Routes to School plans and implement strategies that support safe active transportation and bus transportation to schools. Create bicycle safety education materials through public workshops and web content.
- Action 1.6. Partner with municipalities and the Highway Department to improve connectivity of bikes and trail systems between rural and urban communities. Expand the shoulders of select county-maintained roads to accommodate safe travel for bicycles and pedestrians.

Goal 2: Prepare for adoption of new, low emission transportation technologies.

- Action 2.1. Collaborate with the Wisconsin Department of Transportation (WisDOT) and local utilities to establish public electric vehicle (EV) infrastructure along corridors throughout the county. Explore grant opportunities to secure funding for electric vehicle (EV) infrastructure, including public and private charging stations. When installing EV charging infrastructure, design for future capacity needs by considering anticipated growth in electric vehicle adoption.
- Action 2.2. Collaborate with neighboring governments on regional electric vehicle (EV) planning to develop comprehensive strategies that support EV adoption and infrastructure development.
- Action 2.3. Conduct a rate study to determine parking fees for charging stations that will encourage EV adoption and support infrastructure.
- Action 2.4. Create an EV and EV charger technology guide. Include ADA compliant charger siting information. Share information on EV's, EV technology, and Federal, State, Utility, and County EV programs and incentives available to community members.
- Action 2.5. Collaborate with partners on demonstration events for alternative transportation E-bikes, electric cars, public transit, etc.

Goal 3: Conduct land use planning that supports smart growth principles to prevent urban sprawl, loss of farmlands, and loss of natural areas.

- Action 3.1. Assist with establishing and maintaining boundary agreements between municipalities and townships to conduct proactive land use planning for urban fringe areas and manage urban development.
- Action 3.2. Incentivize or require new developments proposed near existing sanitary districts in unincorporated areas to connect to sanitary district water and sewer or facilities.
- Action 3.3. Explore innovative re-uses of reclaimed non-metallic mines, such as water treatment facilities, wetland banking, re-vegetation projects, agricultural use, landfill sites, and recreational areas.
- Action 3.4. Conduct an environmentally informed zoning analysis to identify potential policy changes that could reduce possible environmental hazards some properties may face due to changing environmental conditions.
- Action 3.5. Require or incentivize developments in shoreland areas to use green infrastructure such as bioswales, permeable pavement, rain gardens, rainwater catchment areas, and other pervious surface strategies to reduce flood risk and minimize sediment entry into waterways.
- Action 3.6. Create a land bank initiative to acquire and assemble priority infill sites, preserve land for stormwater retention and flood mitigation and create parks and dedicated public green spaces.
- Action 3.7. Encourage or require sidewalks and space for future street connections in new subdivisions, particularly those near existing sidewalks, trails, and developed areas.
- Action 3.8. Update the Outdoor Recreation Plan to reflect current community needs, environmental considerations, and sustainable practices. Work with community groups to maintain and improve existing County recreational facilities, including but not limited to trails, parks, and ecological enhancements.

Part 2

ELEMENT 6:

HEALTH, SAFETY, AND ENVIRONMENTAL JUSTICE,

Element 6: Health, Safety, & Environmental Justice

Climate change continues to not only impact the environment worldwide, but it also affects human health. A 2016 study found that annual federal health expenditures are projected to increase from ~1.2 billion to $8 billion by 2100 due to increased frequency of illness related to changing climate conditions (Executive Office of the President of the United States, 2016). Health concerns stem from intensified and prolonged heat waves, increased frequency of disasters, escalated risk of disease transmission, and water and air pollution (EPA, 2023). More information related to anticipated weather-related hazards and local risk can be found in the La Crosse County Multi-Hazards Mitigation Plan.

Air Quality

Since the birth of the environmentalist movements of the 1970's, mitigating air pollution has remained a pressing issue. Originating from various sources such as fuel-burning vehicles, agricultural practices like crop burning, and electricity generation, particulate matter, known as PM2.5, continues to impact public health. Despite being invisible to the naked eye, inhaling these particles that are composed of dirt, smoke, and dust, can lead to asthmatic symptoms, respiratory issues, worsened heart conditions, and even low birth weight. Areas with poor air quality have an increased prevalence of seasonal allergies and various lung and cardiovascular diseases (CDC, 2020).

Figure 26. Hazy skies over La Crosse County in March 2021 due to Canadian wildfires. Source: news8000.com, (July 29, 2021).

La Crosse County maintains an annual ambient concentration of particulate matter at $7.6_{\mu g/m}{}^{3*}$ which is lower than the national average of $12.0_{\mu g/m}{}^{3*}$ (CDC, n.d.). However, as large climate events such as wildfires become more frequent, the county is likely to experience an increase in hazy skies and health advisories.

Human activities and rising global temperatures have contributed to increased occurrences of uncontrollable wildfires. Wildfires destroy valuable carbon sinks and produce vast amounts of toxic GHGs. In 2023, Canada experienced 6,500 successive wildfires that burnt nearly 72,000 acres of forests and

negatively impacted global air quality. These created a thick haze in the air across north America and reduced air quality to unhealthy levels for weeks in La Crosse. Local seniors, children, and others with respiratory issues and asthma, are significantly affected by the harmful particulate matter produced by distant wildfires. Naturally occurring fires and human caused wildfires exacerbate air quality concerns.

Air quality within buildings can also be improved. Buildings that use natural gas and propane heating and kitchen stoves produce carbon emissions and reduce air quality in homes. Heat pumps and electric stoves are more energy efficient and better for the health of building occupants. 40 million homes in the USA have gas stoves (Bendix, 2024). A 2024 study estimates that 50,000 pediatric asthma cases are directly linked to long-term nitrogen oxide exposure from gas and propane stoves (Yannai, 2024). Nitrogen oxide is a product of combustion of natural gas, and natural gas is composed of >90% methane (Yannai, 2024).

Water Quality

Areas of La Crosse County that are most susceptible to groundwater contamination are shown in Figure 27.

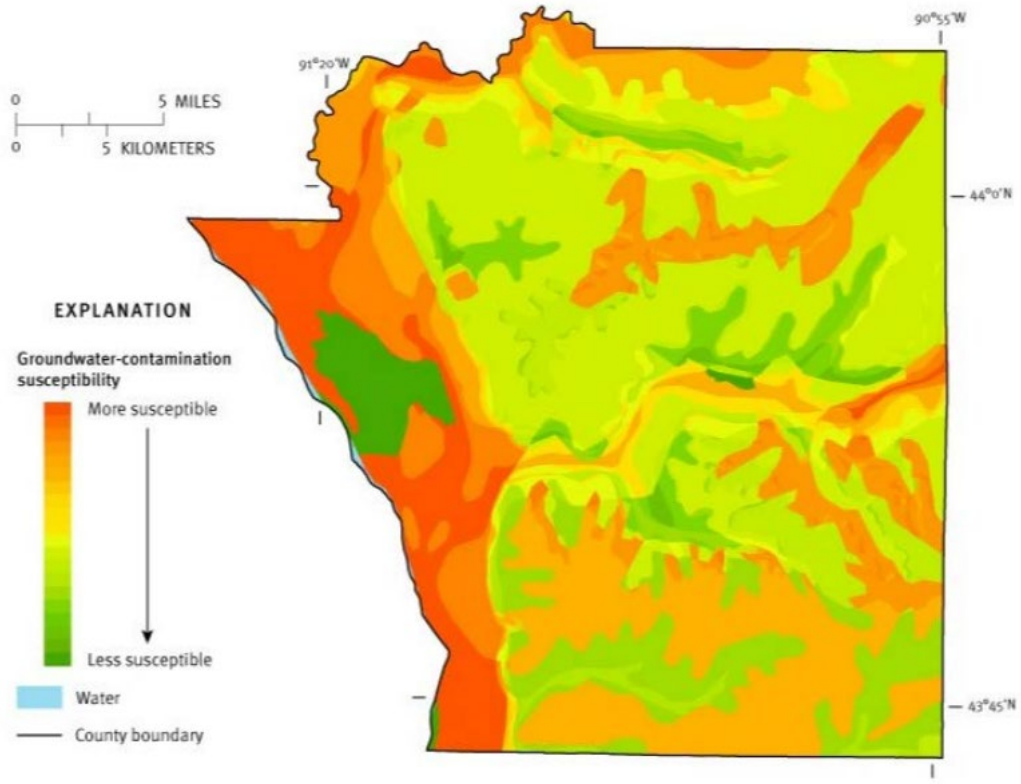


Figure 27. La Crosse County Groundwater Contamination Susceptibility Analysis. Source: La Crosse County Land & Water Resource Management Plan.

In the City of La Crosse and the Town of Campbell, per- and polyfluoroalkyl substances (PFAS) contamination of public and private wells has occurred. PFAS is a category of thousands of man-made, carcinogenic chemicals. These "forever chemicals" are abundant in more than just contaminated soils and groundwater. Humans are constantly exposed to PFAS in

thousands of products including cell phones, electronics, wall paint, furniture, carpeting, mattresses, cooking pans, food, food packaging, tape, cosmetics, and toilet paper.

The City has redundant wells as part of its robust public water service, so it has been able to close contaminated wells and continue to meet public demand for safe water. The Town of Campbell does not have a public water system, so residents with private, contaminated wells do not have another source of safe groundwater. At the time of this plan being written, methods to address global PFAS contamination are still in development.

In rural areas, nitrates, coliform bacteria, and phosphorous have occasionally contaminated private wells. Nitrates can be deadly to infants, and they can cause birth defects if consumed by pregnant women (CDC, 2023). These chemicals are often from run-off of agricultural fertilizers and pesticides, due to overapplication on fields and proximity to highly concentrated confined animal feeding operations (CAFOs). Some of the contamination may also come from septic system drain fields if located too closely to wells within sandy soils. In 2017, the La Crosse County Health Department Nitrate Task Force found that 30% of 540 wells tested by the Department contained nitrate levels that exceeded federal standards and 60% of wells had at least some nitrate contamination (see Appendix D).

As shifts in rainfall patterns occur, there can be an increase in nutrient runoff from agricultural processes entering bodies of water. If these periods of intense rain are followed by a prolonged drought, these bodies of water can hold onto these nutrients for a longer period. This phenomenon coupled with rising temperatures has contributed to a rise in harmful algal blooms such as cyanobacteria, commonly known as blue-green algae. These blooms, which can also appear reddish-purple or brown, can produce toxins that are harmful to both animals and humans, causing illnesses such as vomiting, headaches, and liver damage (EPA, 2024). Community members are encouraged to be mindful of the color of the water and to avoid swimming if they suspect algae is present (La Crosse County, n.d.).

Changes in precipitation patterns have elevated the risk of flooding due to both increased rainfall and longer periods of drought. Between 1950 and 2018, annual precipitation in La Crosse County increased by 20%, with a predicted additional rise of 5% in the future. This is measured as the difference in annual average precipitation between the periods from 2041 to 2060 and the baseline from 1981 to 2010 (Wisconsin Initiative on Climate Change Impacts, n.d.). The majority of La Crosse County faces an 80-100% risk of flooding (EPA, n.d.). Portions of the towns of Shelby, Medary, Onalaska, and Holland are at the greatest risk of increased flooding in the unincorporated areas. While flooding poses concerns for property and crop damage, it also presents significant public health risks. Floodwaters often become contaminated by debris, sewage, and hazardous waste, thereby increasing contamination of drinking water and the likelihood of gastrointestinal illnesses.

Disease Transmission

Many diseases thrive under warm weather conditions. A study published in 2023 found that heat waves appear to accelerate the spread of infectious diseases (Huang, et al., 2023). Anticipated increases in vector-borne illness from insects and animals are concerning.

Changing weather patterns have prompted numerous species, including ticks and mosquitoes, to modify their geographical ranges. Because of this, ticks are now becoming a concern earlier in the year, leading to a heightened risk of spreading conditions such as Lyme disease. While the actual number is likely higher, Wisconsin reported 5,327 cases of Lyme disease in 2022, indicating that the average number of cases has more than doubled over the past 15 years (Wisconsin Department of Health Services, 2023). This disease can result not only in initial symptoms like a rash, fever, and fatigue but also potentially post-Lyme disease syndrome (PLDS), which includes neurological issues and heart inflammation (Johns Hopkins Medicine, n.d.). As ticks continue to expand into new regions and emerge earlier in the year, individuals who engage in outdoor activities or work outdoors, as well as those with pets spending time outside, should be vigilant about tick exposure.

Environmental Justice

Environmental hazards, such as those created by high polluting industries and land uses, have often been placed near disadvantaged populations. Environmental justice is accomplished by improving health equity. "Health equity" requires efforts to eliminate historical and contemporary health disparities so that all people can attain their highest level of health. While extreme weather events and changing weather conditions impact all communities, certain groups face heightened vulnerability. This vulnerability stems from not only physical factors, such as changes in local ecosystems, but also societal and behavioral factors. Policy factors such as historical, widespread, "redlining" relegated millions of people of color to the most polluted areas of communities. A 2022 study conducted by researchers at UC Berkely found that 60% of the residents of communities with the worst air, water, and noise pollution are nonwhite and were "redlined" (Lathan, 2022).

Various conditions such as access to healthcare, income disparities, and experiences of discrimination can interact with environmental circumstances, leading to negative health outcomes. Populations at highest risk include children, individuals with disabilities, those with pre-existing conditions such as asthma or diabetes, pregnant women, adults aged 65 and over, individuals with low-incomes, and workers such as first responders and others who are exposed to extreme weather conditions more frequently (EPA, 2023). As communities around the country strive to make more climate-resilient decisions, it will be imperative to prioritize these groups who are disproportionately affected.

Heat-Related Illness

Heat-related illnesses are soaring in the United States due to increasing temperatures, and it's difficult for hospitals to keep up. According to the New York Times, "Around 2,300 people died from heat-related illnesses in the United States in 2023, triple the annual average between 2004 and 2018. Nearly 120,000 heat-related emergency room visits were recorded across the United States last year…" (Weiland, 2024). Heat related illnesses may include dehydration or "heat stroke". Installation of "green infrastructure" can reduce residents' risk of heat-related illnesses in public areas.

By 2018, the annual average daily temperature of La Crosse County increased by about 5 degrees Fahrenheit compared to the 1950 average (Notaro, n.d.). Projections indicate that the annual average daily temperature is expected to rise by 9.5 degrees Fahrenheit by 2090 compared to the 1980 average (Notaro, n.d.). Rising temperatures can have detrimental effects not only economically, as individuals need to pay more to heat and cool their houses more, but also in terms of health. The Midwest can expect increased heat-related illnesses and deaths from conditions such as heat stroke and heat exhaustion (CDC, 2020).

Areas that experience more frequent droughts may have increased occurrences of malnutrition and food borne illnesses. Increased exposure to traumatic disasters can increase occurrences of distress, grief, and behavioral health disorders, particularly among the elderly, outdoor workers, low-income groups, indigenous peoples, and those with medical conditions (National Institute of Environmental Health Science, 2024).

Climate Resilience & Hazard Mitigation

The changing climate has exacerbated ecological imbalances and have contributed to increasingly prevalent and intense weather disasters. There have been observed extreme weather events such as precipitation, drought, and heat waves that would have been deemed "extremely unlikely" to occur in a normal climactic environment (IPCC, Chapter 11). It is already too late to prevent some of these consequences of climate change. La Crosse County is particularly at an increased risk of flooding, extreme cold, and extreme heat in the future. Risk assessments completed for the County's 2020-2024 Multi-Hazard Mitigation Plan regarding recent and anticipated, local weather disasters are summarized below:

Figure 28. A "100 year" flood in La Crosse in May 2023. Source: La Crosse Tribune.

- Thunderstorms = **High Threat**
    - Average since 1990 – 2.7 events, $22,420 in property damage, $2,125 in crop damage per year.

- Flash Flooding/Storm Water Flooding = **High Threat.** Flooding poses the highest threat to much of La Crosse County.
    - La Crosse County received 48 flooding events from 2000 to 2023 with only 6 reported events between 1960 and 1990. This possibly indicates an increasing recurrence of events per year and will may continue to increase in the future.
    - In 2023, the Mississippi River reached the third highest flood level that's been recorded in La Crosse County.
- Forest/Wildland Fire = **Low Threat**
    - While increased forest fires in recent years globally have been linked to climate change, only one major forest fire in La Crosse County has occurred since 1976, which burned approximately 800 acres and caused $20,000 in property damage.
- Extreme Heat = **Moderate Threat**
    - La Crosse County had experienced 11 heat wave days between 1990 and 2018 which resulted in 2 deaths. La Crosse County can expect to experience 2 or more heat wave days per year in the future.
    - Increased costs associated with additional power consumption and medical costs in response to heat strokes.
    - Extreme heat kills more people nationwide than any other weather event. According to the Wisconsin Department of Health Services, 14 people suffered heat related death, and there were more than 700 hospital visits related to heat in 2022.

Figure 29. A "100 year" flood in La Crosse County in 2018. Source: Winona Daily News.

Figure 30. Flooding in La Crosse in 2021. Source: La Crosse Tribune.

Resilience and hazard mitigation are key components of climate action. Proactively preparing infrastructure and policies for sporadic, devastating events will enable to County to reduce potential losses of life and property due to unpredictable forces of nature. While weather disasters and difficult to predict, the County can ensure it's prepared to protect its residents and operational assets by implementing and updating the La Crosse County Multi-Hazards Mitigation Plan. The plan is due for an update in 2024-2025.

Operations Risk Assessment

To better understand how the County may become more climate resilient, it must consider its potential climate vulnerabilities; primarily, where existing County facilities and operations are vulnerable to the negative impacts of climate change and increasing occurrences of weather disasters. Annual precipitation is expected to increase through periods of extreme rainfall followed by periods of drought. More frequent extreme rainfall events may increase the likelihood of worsened water quality, heightened exposure to diseases carried by insects, property damage, and disruption of services (Wilson, A.B., et al., 2023).

The US Geological Survey (USGS), using data collected over the past 70 years has found that "100 year" floods, which have historically been estimated as having a 1% annual chance of occurring, have become more frequent in recent years (U.S. NSF, n.d.). Located at the confluence of seven rivers, county residents can anticipate increasingly frequent, destructive flood events.

Several La Crosse County properties lie within floodplain areas. La Crosse County should evaluate ways to mitigate the flooding of some of its facilities that could result in costly damage and the interruption of services. Appendix G is an inventory of La Crosse County properties located in FEMA flood hazard areas.

The Multi-Hazard Mitigation Plan projects that over the next 25 years, climate change will cause the following conditions in La Crosse County:

- Increases in temperatures of 6.5°F, with the greatest increases in the winter.
- Sixteen less nights a year with temperatures below 0°F.
- Twenty-four more days a year with temperatures above 90°F.
- More precipitation with more severe precipitation events, resulting in Increased flooding and stormwater inundation.
- Less snow cover, deeper frost depth, and more freeze-thaw cycles.

Health, Safety, & Environmental Justice Goals & Recommended Actions

The County Health Department operates county-wide, and this element relates to several functions of the Health Department, implementation of this section's goals and recommendations may apply county-wide, beyond town boundaries.

Goal 1: Prepare for climate impacts to preserve the health, safety, and welfare of the public.

- Action 1.1. Create a concise sustainability messaging guide that effectively communicates the importance and community benefits of sustainability.
- Action 1.2. Prohibit sump pump connections to public sanitary sewer systems to prevent flooding and sewer system backups. Inspect residences and businesses to enforce regulations.
- Action 1.3. Enhance the coordination between local natural resource agencies and vector control programs to ensure populations of mosquitos, ticks, rodents, and other potential disease vectors are managed in a way that protects human health and ensures ecological integrity and vitality.
- Action 1.4. Educate residents about the health risks associated with the use of natural gas and propane-powered appliances.
- Action 1.5. Partner with public institutions, such as libraries and schools, to provide sustainability education, programming, and resources to the public.

Goal 2: Protect sources of drinking water.

- Action 2.1. Join and promote the EPA's WaterSense Program or the Groundwater Guardian Green Sites program for water utilities to local businesses.
- Action 2.2. Develop a local wellhead protection plan and program to safeguard groundwater resources and ensure the long-term sustainability of drinking water sources.
- Action 2.3. Require the establishment of "green zones" in new subdivisions to protect wells and groundwater resources. Implement guidelines for setback distances, land use restrictions, and best management practices that prioritize groundwater protection and sustainable development.
- Action 2.4. Collaborate with realtors, builders, county officials, and municipal governments to develop processes to inform current and potential residents of well contamination risks.

Goal 3: Establish programs, procedures, and facilities to support most vulnerable and disadvantaged members of our community.

- Action 3.1. Assist residents in signing up for state utility and heating bill assistance programs and home weatherization programs.

- Action 3.2. Adapt public facilities, and develop new ones, to serve as resiliency hubs (community centers that can provide resources before, during, and after climate disasters and emergencies) following guidance from the Urban Sustainability Directors Network (USDN). Establish a cooling center for vulnerable populations (i.e., those with limited mobility or lack of access to private vehicles).
- Action 3.3. Ensure that facilities serving vulnerable populations (e.g., senior centers, libraries, hospitals and clinics) are resilient to climate hazards and have established best practices for responding to emergencies such as flooding, power outages, and extreme heat. Assess facilities and provide guidance to service providers.
- Action 3.4. Ensure there are specific procedures in emergency response and recovery plans that address citizens most vulnerable to weather-related emergencies. These citizens may include those who require mobility assistance; are disproportionately affected by extended power outages, flooding, etc.; or are non-English speakers and readers.
- Action 3.5. Partner with community organizations to assist in communicating with, and supporting, vulnerable community members regarding extreme weather events. Support the creation of call trees and block networks to check on neighbors during/after extreme weather events, particularly when they involve grid disruption. Deploy point-in-time alert systems (e.g., Rave Alert, Nixle) to notify people of extreme weather events, periods of dangerous heat/cold, poor air or water quality, and other public health concerns, and refer them to resources on symptoms and prevention of climate-related illness.

Goal 4: Identify, analyze, and prepare for potential risks and natural hazards resulting from changing climate conditions.

- Action 4.1. Implement, and periodically update, the County's Multi-Hazards Mitigation Plan to enhance resilience, reduce disaster risk, and protect vulnerable populations in the County. Expand projections and evaluations of potential local hazards due to climate change.
- Action 4.2. Complete a detailed climate vulnerability assessment to identify areas facing the greatest climate risk. Use assessment results to create a map of key infrastructure that is vulnerable to climate change and a flash flood risk map to identify areas within the county that are particularly vulnerable. Implement risk reduction and share the results of the assessment, particularly among vulnerable populations and neighborhoods.

Part 2

ELEMENT 7:

GREEN ECONOMY

Element 7: Green Economy

Businesses have become increasingly aware of environmental impacts resulting from their operations. Reducing waste and increasing operational efficiencies is good for business' bottom-line, and it's consistent with foundational principles of sustainability. Much of the local economy is affected by different aspects of the other 6 elements of this plan. Tens of thousands of residents are employed in jobs that relate to these elements and millions of dollars in private and public revenues are generated from related goods produced and services provided. Moreover, recent research indicates that businesses' environmental sustainability practices are becoming more important to consumers (Reichheld, et al., 2023). The World Economic Forum estimates that nature's value to the global economy is $44 trillion dollars, which is more than half of global GDP (Close, 2021).

"The World Economic Forum estimates that nature's value to the global economy is $44 trillion dollars, which is more than half of global GDP (Close, 2021)."

A Harvard Business Review survey found that 65% of consumers want to by brands that advocate for sustainability (White et al., 2019). According to IBM's Institute for Business Value:

- 64% believe that companies that do not act sustainably will experience increased public scrutiny in the future. Prioritizing sustainability helps businesses' bottom-line and gives them a competitive edge in pursuing skilled workers.
- 48% of personal investors consider environmental sustainability of corporations with buying and selling holdings, and 21% who do not consider sustainability currently said they are likely to consider it in the future.
- 54% of consumers are willing to pay a premium for sustainable brands (IBM, 2021b).

"…65% of consumers want to buy brands that advocate for sustainability (White et al., 2019)."

To remain economically competitive nationally and globally, La Crosse County and its economic development partners must proactively consider how local businesses can leverage opportunities in a future "green economy" to reduce impacts to the environment and benefit residents' quality of life. While County government has limited authority to mandate private entities behave sustainably, partnerships, policy amendments, and incentives may be explored to achieve co-beneficial outcomes.

Green Economy

It's estimated that commercial and industrial operations are the source of 21% of global greenhouse gas emissions (Project Drawdown, 2021). La Crosse County is fortunate to have thriving, well-established local businesses that have positively impacted so many people around the world. Leading employers in food processing, food transportation, transportation fuels, and interior climate-controlling systems have an opportunity to reduce emissions locally and globally. Some local businesses, such as Emplify Health (formerly Gundersen Health) and Trane Technologies, have prioritized sustainability and emissions reductions for more than a decade.

Advancements in industries and technologies related to waste diversion, transportation, agriculture, renewable energy, HVAC, and construction are significant components of the decarbonized, "green economy" of the future. Local businesses related to transportation and EVs, solar energy, and interior climate-controlling systems can adapt now to probable economic shifts to a "green economy". The "green economy" of the future will also require new entrepreneurs focused on research, development, and production of new technologies to enable construction of thousands of EV charging stations, renewable energy facilities, electrification of buildings, localized supply chains, and recycling of used materials.

The U.S. Department of Energy recently published a national blueprint titled, *Decarbonizing the U.S. Economy by 2050*, which provides insight into how changes in the building sector can reduce emissions and energy use. Approximately $6 billion of funding is currently available for the development of technologies that accelerate decarbonization. Attracting additional employers producing goods or providing services related to existing, major industries should be a priority to leverage local economic comparative advantages. La Crosse County intends to establish public-private partnerships that assist local industries to enable increased growth and success under the impending conditions of a more sustainable future economy.

The concept of a "circular economy" has received significant political support in the Netherlands. In brief, a circular economy emphasizes reductions in the use of raw materials through re-use/recycling, producing high-quality items with extended lifespans, and reducing emissions from waste through high-grade processing. The Netherlands has adopted several policies to establish a waste-free economy. Successes in the Netherlands may be replicated elsewhere.

Impacted Industries

Changes in the weather can affect general operations of businesses and diminish supplies of raw materials used in several industries. Morgan Stanley Capital International (MSCI) projects that the industries shown in Figure 31 will be most affected by climate risks if no climate action is taken.

While MSCI's projections show a lack of climate action could negatively affect several important industries, being proactive could give many industries a boost. A study from Oxford Economics found that green industries could be worth $10.3 trillion (5% of global GDP) by 2050 (Portala, 2023). For example, consumer staples, which broadly food/agricultural products and household products, may find opportunities to increase production and add value as the climate changes. In the real estate sector, many current investments may be significantly devalued by rising sea levels and other factors. Reduced supply of land and improvements in some areas may inflate the cost of, and demand for, areas that are not as affected by changing climate.

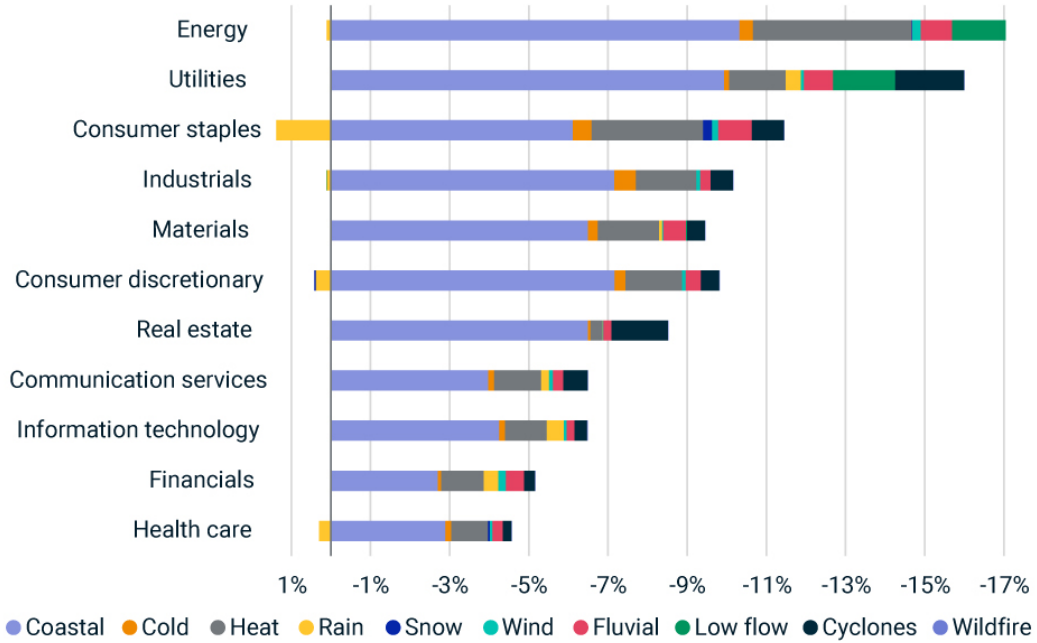


Figure 31. Impact of physical risks at the sector-level under a 2°C REMIND Orderly scenario. Source: https://www.msci.com/www/quick-take/which-sectors-are-most-affected/03827173296. "Chart shows companies' expected downside or upside potential, expressed as a percentage of the companies' market value, assuming trends in extreme cold, extreme heat, extreme precipitation, heavy snowfall, extreme wind, coastal flooding, fluvial flooding, tropical cyclones, river low flow and wildfires continue along the 2°C REMIND Orderly scenario. The chart shows sector averages and does not take into consideration index weights. Data as of April 2023. Source: MSCI ESG Research."

Development of technologies for cleaner modes of transportation, renewable energy generation and storage, energy efficiency, waste management, resilient infrastructure, and environmental engineering present lucrative opportunities. Industries related to climate adaptation and resilience can boost the economy and provide employment opportunities. In our globalized economy, it will be important to support our local businesses that are developing cutting-edge industries and technologies. The amount of local employees that may be affected in La Crosse County can be compared by industry using U.S. Census Bureau data here: DP03: Selected ... - Census Bureau Table.

From 2021-2023, lucrative federal incentives and favorable legislation towards "clean tech", led to companies announcing plans to expand or build 155 American factories (Halper, 2024). Such a significant expansion of domestic manufacturing has not occurred since the early 1990's (Halper, 2024).

Wisconsin is well-prepared for electrification. There's a push to power buildings and transportation with electricity rather than fossil fuels. Under the Bipartisan Infrastructure Law, billions of dollars of funding is available to support businesses supporting electrification. The power electronics industry is a strength/comparative advantage of Wisconsin's that should be leveraged. There are about 25,000 workers making electric generators and motors, industrial controls, and other engine-related parts, which means Wisconsin has 5.7 times the concentration of jobs in power electronics as the entire U.S. (Wisconsin Economic Development Corporation, 2024). Wisconsin's history in the of power electronics and supply of qualified workforce could attract additional development as the industry grows. Complementary industries include auto manufacturers and OEM parts suppliers, transportation and logistics, and vehicle repair and maintenance.

Tourism and outdoor recreation-oriented tourism in La Crosse County could be significantly impacted by changing climate. In 2023, tourism brought $307.3 million in direct visitor spending and $502 million in economic impact, resulting in generation of $35 million in state and local taxes. Taxes from tourists help provide local services and reduces the tax burden of residents. Increasingly high temperatures, water pollution, and extreme weather could reduce the opportunities to fish, boat, swim, hike, bike, and hunt and reduce local revenues stemming from outdoor recreation and related tourism. In the long-term, in a scenario that significant decarbonization is not achieved and alternative fuel technologies are not developed, the availability of fossil fuels will drastically decrease. This will increase the cost of automobile and air travel, which will deter tourists from traveling long distances to the area.

In the winter of 2023-2024, there were 20 to 30 fewer inches of snow across the state than in previous years (Herken, 2024). Warmer winters will reduce opportunities to participate in winter recreation such as skiing, cross country skiing, snowmobiling, and ice fishing. Millions of dollars in state and federal relief funds and loans were provided to Wisconsin businesses impacted by the lack of snowfall during the winter of 2023-2024 (Herken, 2024).

Workforce & Employment

Changing climate patterns will affect those employed outdoors as well as recreation and tourism industries which rely on desirable outdoor conditions to attract spending from travelers. According to the La Crosse County Convention and Visitors Bureau, in 2023, La Crosse County was the 9th most visited county in Wisconsin (Frels, 2024). Tourism supports 4,000 jobs in La Crosse County, and many local businesses rely on revenues from tourism to remain in operation (Frels, 2024).

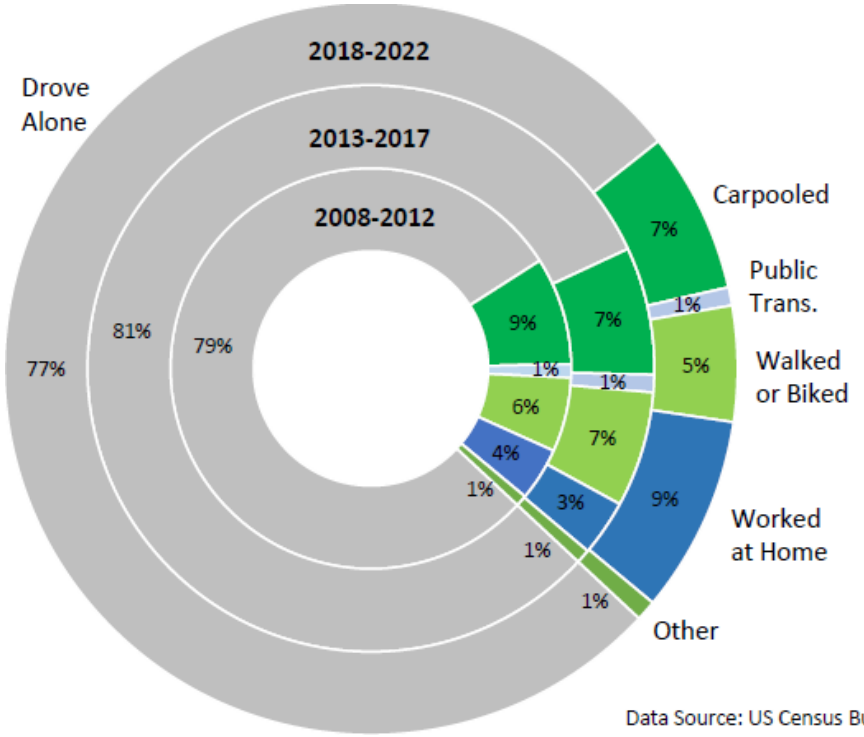
Investing in science, technology, engineering, and mathematics (STEM) education for adolescents will be vital to ensure local youth are able to meet the challenges of the future and support developing industries. As the energy, building, and infrastructure sectors electrify and decarbonize their operations, engineers and electricians will be increasingly in demand. Upskilling HVAC technicians, construction workers, electricians, and automobile mechanics will be

vital to meeting increasing demand for developing technologies. More installers and maintenance technicians for solar photovoltaic energy systems and wind energy conversion systems will be needed. Workforce will also be needed to extract raw materials and manufacture products needed to electrify and decarbonize. Many technician and manufacturing positions may be filled by training existing workforce, and mid-career individ uals on-the-job, through apprenticeships, or at technical colleges.

Changing commuting patterns are also increasing sustainability. The Covid-19 Pandemic caused many employers to add flexibility to working conditions. Many employers have continued to allow more sustainable remote work/telecommuting and flex-time options, which have reduced emissions from commuting. 20% of Americans who began working remotely during the pandemic have continued to work remotely (Thompson, 2023). In April of 2020, changes in mobility, among other factors, reduced global CO2 emission by 17% compared to peak 2019 CO2 emissions (Shreedhar et al., 2022). One study found that working remotely 4 or more days per week can reduce one's carbon footprint by 54% (Thompson, 2023). According to US Census American Community Survey Estimates, the amount of residents working remotely in La Crosse County may have tripled (See Figure 32). Businesses may continue to explore remote working options and alternative scheduling models to reduce employees' emission from commuting, reduce emission from office spaces, and reduce operation and maintenance expenses related to renting or owning office space.

As household sizes are decreasing, and young people are having fewer children, businesses will need to increasingly compete to attract workforce to fill vacant positions. According to IBM's Institute for Business Value, 71% of employees and employment seekers believe that companies that prioritize sustainability are more attractive that companies that do not (IBM, 2021a). Two-thirds of those surveyed stated they are more likely to apply for and accept jobs with environmentally responsible employers, and nearly half of respondents would accept lower salary to join such organizations (IBM, 2021a).

Figure 32. Changes in commuting patterns. Source: Olson, A. (2024). 2023 Sustainability Indicators Report.



With increased occurrences of disasters, and reduced air, water, and soil quality, there may be increased demand on the healthcare industry.

Cost of Climate Change

In 2023, disasters cost the United States $94.9 billion. From 2013 to 2023, adjusted for inflation in 2024 dollars, the average annual cost of all disasters in the United States was $127.4 billion (NOAA NCEI, 2024). Adjusted for inflation in 2024 dollars, the average annual cost of disasters in the United States from 1980 to 1990 was 82% lower ($22.9 billion) than the 2013 to 2023 average (NOAA NCEI, 2024). Global real estate investment company, BlackRock, estimates that, "the median risk of commercial properties being hit by a category 4 or 5 hurricane in the United States has increased by 137% since 1980, and the risk continues to increase (BlackRock Investment Institute, 2024). BlackRock estimates that 58% of U.S. metros will experience annualized GDP losses of 1% or more by 2060-2080 if no climate action is taken (BlackRock Investment Institute, 2024). The increasing severity of severe weather increases the cost of crop insurance, homeowners' insurance, floodplain insurance, and costs to U.S. taxpayers. In recent years, several prominent insurance companies have either hiked rates or completely dropped coverage from areas that have become increasingly vulnerable to severe weather (Crowley, 2023). Severe weather displaces American businesses and households and destroys aging infrastructure, in turn disrupting the U.S. economy and national GDP.

A 2024 study, entitled *Confronting Wisconsin's Climate Costs*, projects that it will cost $16.7 billion through 2040 to protect Wisconsin communities from increasing precipitation, coastal erosion, extreme heat, and climate-induced public health threats (The Center for Climate Integrity, 2024). Stormwater and drainage infrastructure adaptations and road maintenance comprise 39.9% and 30.5%, respectively, of the total calculated cost. If climate adaptation does not occur, the cost of a handful of disasters that may occur in the next 16 years could cost taxpayers more than the estimated $16.7 billion cost of adaptation projects.

In addition to threatening the health and safety of workers, high and low temperature extremes may reduce the number of days construction can occur outdoors and seasonally slow business and infrastructure development in Wisconsin.

Green Economy Goals & Recommended Actions

The County's Community Development Team operates county-wide, and this element relates to several functions of Community Development. Implementation of this section's recommended actions may apply county-wide.

Goal 1: Prepare the local workforce for emerging career opportunities related to sustainability, electrification, and energy.

- Action 1.1. Establish a green jobs apprenticeship and internship program. Promote internship placement with local employers.
- Action 1.2. Work with local partners and employers to develop a community green jobs electronic bulletin board promoting local green job opportunities.
- Action 1.3. Prepare potential employment, training, and housing opportunities for anticipated climate migration.

Goal 2: Establish La Crosse County as a hub for emerging industries related to sustainability, electrification, and energy.

- Action 2.1. Develop a targeted marketing strategy to attract businesses within "green" industries.
- Action 2.2. Evaluate various circular economy models to determine their feasibility and strategies for local implementation.
- Action 2.3. Establish programs and policies to encourage development of local businesses that use waste resources in the manufacture of their products. Consider development of a sustainable materials business park, similar to the Phoenix Resource Innovation Campus or the Kent County Sustainable Business Park.
- Action 2.4. Develop partnerships with businesses to repurpose wastewater.
- Action 2.5. Quantify the economic benefits of implementing the Community Sustainability Plan and attracting emerging industries.
- Action 2.6. Encourage retailers and restaurants to donate, reduce, reuse, or compost their unsold food. Designate “zero-waste managers” to educate staff and help manage products reaching the end of their marketable life, donation of edible unsold products, and collection of organic waste for composting.

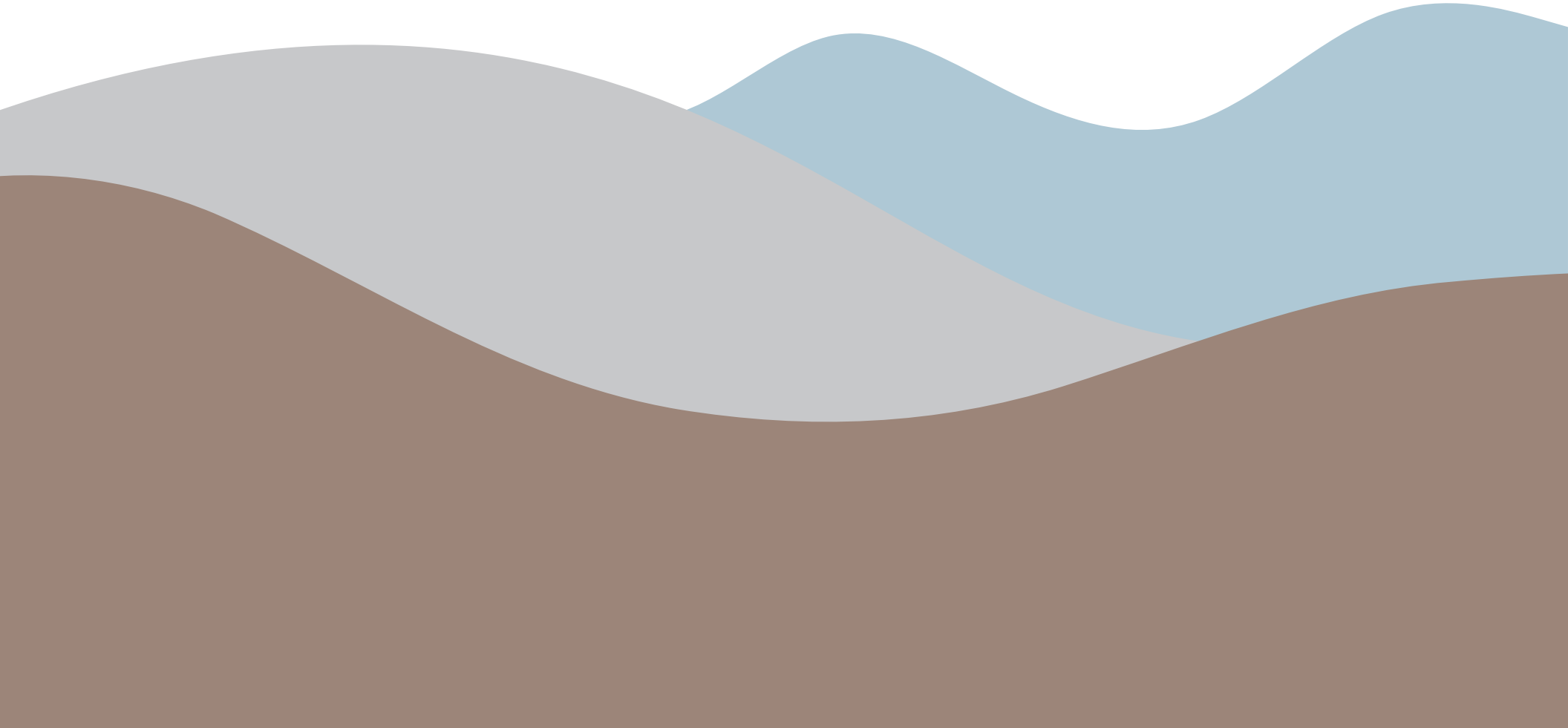
Goal 3: Support businesses that prioritize sustainability and aim to reduce the environmental impact of their operations.

- Action 3.1. Update existing County Community Development loans and grants to include energy efficiency improvements as eligible costs. Update grant scoring rubrics to include bonus points for project components related to energy efficiency and sustainability. Establish a grant specifically tailored to support businesses in implementing energy efficiency and sustainability-related projects.
- Action 3.2. Work with distribution and other refrigeration users in La Crosse to voluntarily phase out refrigerants with high ozone depletion and global warming potential in advance of US EPA phaseout. Explore rebates for improving refrigeration efficiency.
- Action 3.3. Require recycling and diversion of waste created by demolition projects funded by the County's Housing Acquisition & Demolition Grant.

- Action 3.4. Market the Property Assessed Clean Energy (PACE) Program. Assist business owners with pursuit of PACE funds for energy upgrades.
- Action 3.5. Promote commercial and industrial energy efficiency audit and upgrade programs. Develop energy efficiency programs for businesses that don't own their own building. Use the Minnesota Chamber of Commerce's Energy Smart program as a model. Goal: 10% of commercial/ industrial buildings by 2030 achieving a 20% efficiency increase per location.

Part 2

IMPLEMENTATION



V. Implementation

La Crosse County staff will lead the implementation of this plan in partnership with residents, community groups, government agencies, and private entities. La Crosse County Zoning, Planning, & Land Information, Community Development, Facilities/Parks, Solid Waste, Emergency Services, Administration, and Land Conservation departments will be key leads for various plan recommendations. County's sustainability staff will coordinate with partners to manage projects and implementation progress. Implementation details are included in the Implementation Guide in Appendix B.

Sustainability staff will coordinate with partners to manage projects and implementation progress. Implementation details are included in the Implementation Guide in Appendix B. The Guide also includes estimated project timelines:

- Ongoing = Ongoing action
- Short-term = Anticipated priority in next 1 - 5 years
- Mid-term = Anticipated priority in next 5 -10 years
- Long-term = Anticipated priority in next 10 - 25 years

Recommended actions for implementation are considered "a-la-carte", meaning actions may be prioritized based on what may most realistically be achieved over time. With so many possible actions that could realistically be conducted to improve sustainability in La Crosse County, it will be challenging to complete them all. The list of a variety of recommended actions in the Implementation Guide in Appendix B allows those implementing this plan to be agile as times, priorities, and available funding related to particular actions may shift.

To establish realistic, non-arbitrary success metrics for community sustainability, further analysis is necessary. Use of a platform like ICLEI ClearPath will allow reasonable progress metrics to be identified using current, available data. ClearPath processes emissions data to project climate action progress and set realistic performance metrics. Some county-wide success metrics to evaluate possible outcomes of the implementation of this plan may include the following:

1. Amount of waste diverted from the La Crosse County Landfill.
2. Reduction in total suspended solids (TSS) in local watersheds.
3. Reduced vehicle miles travelled on County roads.
4. A decrease in waste generated in La Crosse County.
5. Increases energy generated from renewable sources.
6. Increased transit ridership.
7. Reduced contaminants within impaired waters.
8. Planting of trees and carbon sinks
9. New local jobs created in green industries.
10. Increased residential solar installations annually.

Annual Evaluation

Annually, staff will:

- Take account of plan recommendations that have been achieved.
- Evaluate success metric progress.
- Assess recommendation feasibility.
- Prioritize recommendations for implementation.
- Estimate budget requirements for subtasks of recommendations.

When prioritizing tasks, staff will consider the "triple bottom-line" of sustainability framework (Figure 33). This framework outlines the "3 P's", which are referred to as the "3 E's" in variations of the model; People (Equity), Planet (Environment), and Prosperity (Economy). Realistic goals related to sustainability can be achieved by balancing the 3 P's. Improving sustainability can often directly or indirectly reduce carbon emissions. High priority tasks to support recommendations will be based upon this framework, which establishes that the most impactful actions resulting from this plan will balance and support the 3 Ps of the triple bottom-line.

Figure 33. Triple Bottom-Line of Sustainability. Source: University of Iowa Office of Sustainability & the Environment, https://sustainability.uiowa.edu/about-us/what-sustainability

Part 2

APPENDICIES

Appendix A:

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Appendix B:

Implementation Guide

Climate Action Plan Implementation Guide (Part 2 - Community Sustainability)

Goal		Recommended Action	Staff Lead(s)	Timeline
Element I: Environmental Conservation				
Goal 1. Increase natural areas, green spaces, and carbon sinks to improve climate resilience.	1.1	Hold an annual tree sale or giveaway to increase greenspaces and carbon sinks. Provide maintenance information to participants. Establish programmatic goals.	Facilities, Land Conservation	Short-term
	1.2	Expand pollinator-friendly, native plantings county-wide. Establish a fund and partner with property owners to plant several acres annually.	Facilities	Short-term
	1.3	Provide financial support to, or collaborate with, land trusts to protect critical natural areas, particularly those in or near waterways. Incentivize dedication of lands for protection using conservation easements.	Facilities, Land Conservation	Mid-term
	1.4	Use federal, state, or non-profit programs that promote afforestation and purchase lands to improve continuity and expansion of the County Forests. Sequester carbon through planting on new vegetation in these areas.	Facilities, Land Conservation	Long-term
	1.5	Protect and restore natural systems that protect the community from flooding, including parks, wetlands, riparian areas, and natural drainage ways/swales. Conduct a GIS analysis to identify areas of opportunity.	Facilities, Land Conservation, Land Information	Ongoing
	1.6	Identify opportunities for increased forestry and forest management at county parks and county forests. Sequester carbon by planting more trees at county-owned properties.	Facilities, Land Conservation	Mid-term
Goal 2. Engage community members to share information and expand local conservation efforts.	2.1	Offer technical guidance and financial support to towns that wish to develop and implement stormwater utility policies to improve water management, reduce flooding risks, and enhance water quality.	Sustainability Lead	Ongoing
	2.2	Assist with the Soak It Up urban stormwater management program, aimed at improving water quality and reducing runoff through green infrastructure and community engagement initiatives.	Land Conservation	Ongoing
	2.3	Design and implement demonstration projects in collaboration with community members, such as planting native species in open spaces within business parks adjacent to the landfill, showcasing sustainable landscaping practices.	Land Conservation	Long-term
	2.4	Continue to partner with landowners in the Bostwick Creek and Coon Creek Watersheds to improve water quality.	Land Conservation	Ongoing
Goal 3. Reduce human impacts to natural areas.	3.1	Establish a grant program to support outdoor sustainability improvements by providing funds for composting bins, rain barrels, and planting trees.	Sustainability Lead	Mid-term
	3.2	Educate community on integrated pest management practices and best management practices to minimize chemical use on lawns.	Sustainability Lead	Mid-term
	3.3	Reduce salt used on roads as much as possible. Host Wisconsin Salt Wise workshops to educate salt applicators on best salt management practices. Require salt applicators to obtain a Salt-Wise Certification.	Facilities, Highway	Short-term
	3.4	Incentivize or require green infrastructure and minimum green space provisions to offset impacts of impervious surfaces constructed in new subdivisions. Encourage or require tree plantings in new subdivisions.	Planner, Surveyor	Mid-term
	3.5	Require large commercial and light industrial business developments to create comprehensive stormwater management plans that establish infiltration and pollutant reduction standards reduce flooding on neighboring properties.	Land Conservation, Planner	Mid-term
Goal 4. Analyze the health and quality of the local environment to identify and address barriers to local sustainability.	4.1	Conduct a GIS analysis to assess opportunities for rehabilitation of habitats, impaired water sources, soil, forests, and prairies.	Land Information	Mid-term
	4.2	Map stormwater conveyance systems within the County's Storm Sewer System area to analyze existing infrastructure.	Land Conservation	Short-term
	4.3	Continue to periodically update and implement the County's Land and Water Resource Management Plan. Expand funding and implementation where feasible.	Land Conservation	Ongoing
	4.4	Conduct biannual water quality sampling of the County's 27 watersheds. Implement practices that reduce phosphorous and fecal coliforms in waterbodies.	Land Conservation	Ongoing
Element II: Agriculture & Local Food System				
Goal 1. Assist local producers with becoming climate resilient.	1.1	Promote agroforestry practices such as expanding tree canopies in livestock pastures to mitigate the effects of increasing temperatures. Establish a program to assist farmers in funding roofed farmyards for livestock.	Land Conservation, UW Extension	Mid-term
	1.2	Join the 4 per 1000 Initiative, which is an international initiative consisting of governments, foundations, research organizations, private companies, and farm and forestry organizations who are committed to improving soil carbon management, combating poverty and food insecurity, and mitigating climate change. Review the states-and-local-authorities list of action item commitments and take action that makes strategic sense related to this plan.	Sustainability Lead	Short-term
	1.3	Provide agricultural labor force training on growing, marketing, and preparing local, climate-resilient food.	Sustainability Lead	Long-term
Goal 2. Continue to support producers in implementing soil and water conservation best management practices.	2.1	Implement the Wisconsin Transition to Grass program to help farmers improve soil, water, and livestock health.https://www.cleanwisconsin.org/bipartisan-transition-to-grass-legislation-will-help-wisconsin-farmers-improve-soil-water-and-livestock-health/?org=825&lvl=100&ite=2490&lea=3254849&ctr=0&par=1&trk=	Land Conservation	Short-term
	2.2	Showcase local conservation projects to agricultural producers and the public. These events will feature demonstrations of successful conservation practices, such as soil health management, water conservation techniques, and biodiversity enhancement.	Land Conservation	Ongoing
	2.3	Implement conservation education programs focused on agricultural best management practices, including methods for carbon capture and surface water management. Conduct farmer workshops on nutrient management planning to enhance crop yields, promote soil health, prevent runoff, and reduce environmental impacts.	UW Extension	Ongoing

	2.4	Commission a feasibility study to explore potential opportunities for a biomass “upcycling” facility that would produce value-added biomass products. The upcycling facility could include a regional manure composting operation, a mixed substrate composting operation, and a processing operation for biomass harvested from nutrient catch strips and agricultural land prairie strips.	Sustainability Lead	Mid-term
Goal 3. Improve production of, and access to, local, healthy foods.	3.1	Establish a Food Policy Council that will advise county officials and staff on enhancing local food supply chains and improving food access. The council will focus on creating local partnerships to increase access to affordable and nutritious food options in the community. Create a Food Systems Plan that addresses the production, distribution, value-added, marketing, end-market, and disposal of food, and charge the Food Policy Council with overseeing the plan’s implementation.	Sustainability Lead, Health, Community Development	Mid-term
	3.2	Identify and map any healthy "food deserts" within the community and leverage tools, such as grants, incentives, and partnerships with local businesses, to increase access to nutritious food options.	Health, Land Information	Mid-term
	3.3	Increase local access to plant-based foods by collaborating with retailers and food vendors to expand their offerings of affordable plant-based options, and by supporting initiatives such as community gardens, and partnerships with local producers. Create education opportunities that promote the health and environmental benefits of eating plant-based and low-carbon foods.	Health	Mid-term
Element III: Waste Reduction & Diversion				
Goal 1. Share waste disposal programs and County sustainability efforts with the public to increase access and awareness.	1.1	Increase public awareness of waste drop off sites in the towns and their regulations through education and outreach. Organize and standardize the system of municipal drop-off sites. Implement consistent guidelines, operational hours, and accepted materials across all sites to streamline user's experience. Develop clear signage and user-friendly instructions at each site.	Sustainability Lead, Solid Waste	Mid-term
	1.2	Establish an interpretive center at the current landfill office and provide interpretive signs, displays, materials and programs to explain the ecology of the planned restoration of prairies, savannas, and woodlands.	Solid Waste, Facilities, Land Conservation	Long-term
	1.3	Communicate information on waste reduction, recycling, and organics collection options available for residents. This information should be collected from, and based on, content shared by regional waste collecting, recycling, composting, and reuse organizations. Models include the City of Portland’s Be Cart Smart, and the City of Fayetteville’s Solid Waste Diversion and Recycling Education Plan.	TBD, Solid Waste	Ongoing
Goal 2. Develop new strategies for recycling and waste diversion to maximize the operational life of the La Crosse County Landfill.	2.1	Establish a "repair cafe" periodically at the landfill to provide community members with a space to bring broken items and receive assistance with repairs. These cafes will offer tools, materials, and volunteer experts who can help repair a variety of items, such as electronics, clothing, furniture, and household appliances. Determine feasibility of partnership and consolidation of multiple services to minimize impacts to carbon footprint.	Solid Waste, Sustainability Lead	Mid-term
	2.2	Promote partnerships with local thrift stores and Habitat for Humanity to increase resource reuse. These collaborations can include joint donation drives, and coordinated efforts to repurpose and resell household items, building materials, and furniture.	Solid Waste, Sustainability Lead	Ongoing
	2.3	Facilitate the recycling of refrigerants and refrigeration equipment by establishing accessible recycling programs.	Solid Waste	Ongoing
	2.4	Establish a demolition materials facility to divert more demolition materials from being landfilled. Collaborate with municipalities to develop a construction and demolition waste management ordinance aimed at increasing the recycling of waste materials. Include deconstruction inspection as part of the demolition requirements for residential and commercial buildings. Remaining construction and demolition waste will be directed to the County recovery facility for proper disposal.	Solid Waste, Sustainability Lead	Ongoing
	2.5	Offer technical assistance and evaluate ways to expand the County's successful single stream recycling program.	TBD, Solid Waste	Mid-term
	2.6	Ensure community-wide access to composting sites. Consider providing a curbside collection composting service. Promote the use of existing composting programs and facilities.	TBD, Solid Waste	Mid-term
Goal 4. Analyze landfilled waste to better understand local waste streams.	4.1	Perform a study to determine how much waste could be diverted from the landfill for combustion by Xcel Energy.	Solid Waste	Short-term
	4.2	Develop a waste audit and diversion assistance program, helping businesses establish tracking and reporting waste streams; identify reduction, diversion, and beneficial use opportunities; and identify financing to improve businesses' bottom-line.	Solid Waste	Mid-term
	4.3	Partner with waste haulers to inventory town recycling drop off tonnages. Explore ways to increase recycling participation and capacity.	Solid Waste	Mid-term
	4.4	Conduct a feasibility study on implementing 'landfill mining' to divert more waste and generate recycling revenue. This study should analyze the composition and characteristics of landfill waste, potential environmental impacts, technological requirements, and economic viability.	Solid Waste	Long-term
Element IV: Energy Efficiency & Renewable Energy				
Goal 1. Increase use of low-emission, renewable energy.	1.1	Coordinate a group-buy program for solar installations, heat pumps, and home electric vehicle (EV) charging stations to offer bulk pricing discounts. Goal: >10 homes annually.	Sustainability Lead	Short-term
	1.2	Advocate for proactive language for residential and commercial uses within ordinances that reduce ambiguity and streamline the permitting process for renewable energy. For example, add language to the zoning ordinance to specify that ground-mounted solar installations are exempt from being counted towards the estimation of allowed accessory structure size on a property.	Planner, Sustainability Lead	Ongoing
	1.3	Support individual and institutional solar energy projects by implementing incentives, providing technical assistance, conducting educational campaigns, and streamlining permitting processes.	Sustainability Lead	Short-term
	1.4	Support towns in acquiring solar energy systems on town properties by providing technical assistance and incentives.	Sustainability Lead	Short-term
	1.5	Research and inventory HOA documents and restrictive covenants which illegally restrict the use of solar use in neighborhoods.	Sustainability Lead	Mid-term
	1.6	Evaluate the feasibility of partnering with farmers and local utilities to create a manure biodigester cooperative that reduces methane emissions, significantly improves the nutrient uptake speed of manure spreading, reduces risk of surface water contamination, financially supports local farmers, assists farmers with WDNR nutrient management compliance, and produces energy for the community.	Sustainability Lead	Long-term
	2.1	Establish a sustainability resource work group for builders and HVAC companies to collaborate on sustainable building practices, energy-efficient HVAC systems, and renewable energy integration.	Sustainability Lead	Mid-term
	2.2	Promote weatherization grant programs to increase public awareness and participation.	Sustainability Lead, Health	Ongoing

Goal 2. Improve building energy efficiency, lower energy bills, and reduce emissions from building energy use.	2.3	Promote use of Focus On Energy programs, such as its home energy rebate program. Establish a small local grant program to promote home energy efficiency upgrades, including HVAC/heat pumps, weatherization, efficiency windows, insulation, electric stoves, and electric panel upgrades.	Sustainability Lead	Ongoing
	2.4	Communicate available energy efficiency incentives to residents, focusing on low-income and minority residents. Contract with an organization to reduce the cost for low-income residents to receive professional home energy audits and recommendations for energy use reduction and monitoring. Develop a program to identify and implement measures that increase the durability, safety, and efficiency of their homes. Goal: 10 households annually, each achieving 15% energy use reductions.	Sustainability Lead	Ongoing
Goal 3. Improve the resilience of the electrical grid as climate changes and demand for electricity increases.	3.1	Work with stakeholders to support utility efforts to modernize the electric distribution grid in the County. Promote green power purchase options, such as those provided by Xcel Energy's "Renewable Connect". Collaborate on promotion and education of available options.	Sustainability Lead	Mid-term
	3.2	Develop a protocol for calculating county-wide GHG emissions. The County should develop a baseline for these emissions as soon as possible and then track the emissions to estimate the emission reductions resulting from initiatives.	Sustainability Lead	Short-term
	3.3	Address issues with energy time-of-use/availability at peak usage by increasing storage capacity. Help property owners address hurdles to implementation of energy storage infrastructure including collaboration to develop incentive programs and permit streamlining if determined to be a significant constraint. Explore partnerships with US Department of Energy, NREL, LNBL, SolSmart and other resources.	Sustainability Lead	Long-term
	3.4	Pursue US Department of Energy or Wisconsin Public Service Commission Funding to complete a comprehensive rural energy plan, renewable resource planning, and building energy audits for towns interested in reducing their energy bill and improving resilience.	Sustainability Lead	Short-term
Element V: Land Use & Transportation				
Goal 1. Remove barriers to use of transit and active transportation.	1.1	Collaborate with the La Crosse Municipal Transit Utility (MTU), Shared Ride, SMRT, and other transit providers to enhance and expand their systems, with a focus on improving transit accessibility, frequency, and coverage across the county.	SMRT	Ongoing
	1.2	Collaborate with the La Crosse Area Planning Committee (LAPC) to strategically plan and fund enhanced connections for alternative transportation throughout the urban towns, focusing on improving infrastructure for pedestrians, bicycles, and electric vehicles.	SMRT, Planner	Ongoing
	1.3	Develop a public-facing resource that maps all bike routes and pedestrian paths throughout the county.	Land Information, Planner, LAPC	Short-term
	1.4	Identify locations for “Park & Rides” in rural parts of the county. Explore feasibility of micro-transit and other solutions for rural community that connect to existing transportation infrastructure.	SMRT, Planner, LAPC	Mid-term
	1.5	Regularly update Safe Routes to School plans and implement strategies that support safe active transportation and bus transportation to schools. Create bicycle safety education materials through public workshops and web content.	Health, Planner, LAPC	Ongoing
	1.6	Partner with municipalities and the Highway Department to improve connectivity of bikes and trail systems between rural and urban communities. Expand the shoulders of select county-maintained roads to accommodate safe travel for bicycles and pedestrians.	Highway, LAPC	Long-term
Goal 2. Prepare for adoption of new, low emission transportation technologies.	2.1	Collaborate with the Wisconsin Department of Transportation (WisDOT) and local utilities to establish public electric vehicle (EV) infrastructure along corridors throughout the county. Explore grant opportunities to secure funding for electric vehicle (EV) infrastructure, including public and private charging stations. When installing EV charging infrastructure, design for future capacity needs by considering anticipated growth in electric vehicle adoption.	Sustainability Lead, Planner, LAPC	Mid-term
	2.2	Collaborate with neighboring governments on regional electric vehicle (EV) planning to develop comprehensive strategies that support EV adoption and infrastructure development.	Sustainability Lead, Planner, LAPC	Short-term
	2.3	Conduct a rate study to determine parking fees for charging stations that will encourage EV adoption and support infrastructure.	Sustainability Lead, LAPC	Short-term
	2.4	Create an EV and EV charger technology guide. Include ADA compliant charger siting information. Share information on EV's, EV technology, and Federal, State, Utility, and County EV programs and incentives available to community members.	Sustainability Lead, LAPC	Short-term
	2.5	Collaborate with partners on demonstration events for alternative transportation E-bikes, electric cars, public transit, etc.	Sustainability Lead, LAPC	Short-term
Goal 3. Conduct land use planning that supports smart growth principles to prevent urban sprawl, loss of farmlands, and loss of natural areas.	3.1	Assist with establishing and maintaining boundary agreements between municipalities and townships to conduct proactive land use planning for urban fringe areas and manage urban development.	Planner	Ongoing
	3.2	Incentivize or require new developments proposed near existing sanitary districts in unincorporated areas to connect to sanitary district water and sewer or facilities.	Planner, Surveyor	Short-term
	3.3	Explore innovative re-uses of reclaimed non-metallic mines, such as water treatment facilities, wetland banking, re-vegetation projects, agricultural use, landfill sites, and recreational areas.	Land Conservation, Planner, Sustainability Lead	Mid-term
	3.4	Conduct an environmentally informed zoning analysis to identify potential policy changes that could reduce possible environmental hazards some properties may face due to changing environmental conditions.	Land Information, Planner, Zoning Administrator	Mid-term
	3.5	Require or incentivize developments in shoreland areas to use green infrastructure such as bioswales, permeable pavement, rain gardens, rain water catchment areas, and other pervious surface strategies to reduce flood risk and minimize sediment entry into waterways.	Planner, Zoning, Land Conservation	Long-term
	3.6	Create a land bank initiative to acquire and assemble priority infill sites, preserve land for stormwater retention and flood mitigation, and create parks and dedicated public green spaces.	Planner, Sustainability Lead, Facilities	Long-term
	3.7	Encourage or require sidewalks and space for future street connections in new subdivisions, particularly those near existing sidewalks, trails, and developed areas.	Surveyor, Planner	Mid-term
	3.8	Update the Outdoor Recreation Plan to reflect current community needs, environmental considerations, and sustainable practices. Work with community groups to maintain and improve existing County recreational facilities, including but not limited to trails, parks, and ecological enhancements.	Facilities, Community Development Manager, Planer, Land Conservation	Ongonig
Element VI: Health, Safety, & Environmental Justice				
	1.1	Create a concise sustainability messaging guide that effectively communicates the importance and community benefits of sustainability.	Sustainability Lead	Ongoing

Goal 1. Prepare for climate impacts to preserve the health, safety, and welfare of the public.	1.2	Prohibit sump pump connections to public sanitary sewer systems to prevent flooding and sewer system backups. Inspect residences and businesses to enforce regulations.	Health	Short-term
	1.3	Enhance the coordination between local natural resource agencies and vector control programs to ensure populations of mosquitos, ticks, rodents, and other potential disease vectors are managed in a way that protects human health and ensures ecological integrity and vitality.	Health	Mid-term
	1.4	Educate residents about the health risks associated with the use of natural gas and propane-powered appliances.	Sustainability Lead, Health	Mid-term
	1.5	Partner with public institutions, such as libraries and schools, to provide sustainability education, programming, and resources to the public.	Sustainability Lead, Health	Ongoing
Goal 2. Protect sources of drinking water.	2.1	Join and promote the EPA's WaterSense Program or the Groundwater Guardian Green Sites program for water utilities to local businesses.	Sustainability Lead, Health	Short-term
	2.2	Develop a local wellhead protection plan and program to safeguard groundwater resources and ensure the long-term sustainability of drinking water sources.	Health, Sustainability Lead	Mid-term
	2.3	Require the establishment of "green zones" in new subdivisions to protect wells and groundwater resources. Implement guidelines for setback distances, land use restrictions, and best management practices that prioritize groundwater protection and sustainable development.	Health, Sustainability Lead, Surveyor, Planner	Short-term
	2.4	Collaborate with realtors, builders, county officials, and municipal governments to develop processes to inform current and potential residents of well contamination risks.	Health	Short-term
Goal 3. Establish programs, procedures, and facilities to support most vulnerable and disadvantaged members of our community.	3.1	Assist residents in signing up for state utility and heating bill assistance programs and home weatherization programs.	Human Services, Sustainability Lead	Ongoing
	3.2	Adapt public facilities, and develop new ones, to serve as resiliency hubs (community centers that can provide resources before, during, and after climate disasters and emergencies) following guidance from the Urban Sustainability Directors Network (USDN). Establish a cooling center for vulnerable populations (i.e., those with limited mobility or lack of access to private vehicles).	Human Services, Facilities	Long-term
	3.3	Ensure that facilities serving vulnerable populations (e.g., senior centers, libraries, hospitals and clinics) are resilient to climate hazards and have established best practices for responding to emergencies such as flooding, power outages, and extreme heat. Assess facilities and provide guidance to service providers.	Emergency Management, Health, Human Services	Mid-term
	3.4	Ensure there are specific procedures in emergency response and recovery plans that address citizens most vulnerable to weather-related emergencies. These citizens may include those who require mobility assistance; are disproportionately affected by extended power outages, flooding, etc.; or are non-English speakers and readers.	Emergency Management, Health, Human Services	Ongoing
	3.5	Partner with community organizations to assist in communicating with, and supporting, vulnerable community members regarding extreme weather events. Support the creation of call trees and block networks to check on neighbors during/after extreme weather events, particularly when they involve grid disruption. Deploy point-in-time alert systems (e.g., Rave Alert, Nixle) to notify people of extreme weather events, periods of dangerous heat/cold, poor air or water quality, and other public health concerns, and refer them to resources on symptoms and prevention of climate-related illness.	Emergency Management, Human Services	Long-term
Goal 4: Identify, analyze, and prepare for potential risks and natural hazards resulting from changing climate conditions.	4.1.	Implement, and periodically update, the County's Multi-Hazards Mitigation Plan to enhance resilience, reduce disaster risk, and protect vulnerable populations in the County. Expand projections and evaluations of potential local hazards due to climate change.	MRRPC, Emergency Management	Updating 2025 - 2026
	4.2.	Complete a detailed climate vulnerability assessment to identify areas facing the greatest climate risk. Use assessment results to create a map of key infrastructure that is vulnerable to climate change and a flash flood risk map to identify areas within the county that are particularly vulnerable. Implement risk reduction and share the results of the assessment, particularly among vulnerable populations and neighborhoods.	Emergency Management, Land Information, Health, Human Services, Sheriff	Mid-term
Element VII: Green Economy				
Goal 1. Prepare the local workforce for emerging career opportunities related to sustainability, electrification, and energy.	1.1	Establish a green jobs apprenticeship and internship program. Promote internship placement with local employers.	Community Development, Sustainability Lead	Mid-term
	1.2	Work with local partners and employers to develop a community green jobs electronic bulletin board promoting local green job opportunities.	Community Development, Sustainability Lead	Mid-term
	1.3	Prepare potential employment, training, and housing opportunities for anticipated climate migration.	Community Development	Long-term
Goal 2. Establish La Crosse County as a hub for emerging industries related to sustainability, electrification, and energy.	2.1	Develop a targeted marketing strategy to attract businesses within emerging industries related to sustainability.	Community Development, Sustainability Lead	Mid-term
	2.2	Evaluate various circular economy models to determine their feasibility and strategies for local implementation.	Sustainability Lead	Long-term
	2.3	Establish programs and policies to encourage development of local businesses that use waste resources in the manufacture of their products. Consider development of a sustainable materials business park, similar to the Phoenix Resource Innovation Campus or the Kent County Sustainable Business Park.	Sustainability Lead	Long-term
	2.4	Develop partnerships with businesses to repurpose wastewater.	Sustainability Lead	Long-term
	2.5	Quantify the economic benefits of implementing the Community Sustainability Plan and attracting emerging industries.	Sustainability Lead	Short-term
	2.6	Encourage retailers and restaurants to donate, reduce, reuse, or compost their unsold food. Designate “zero-waste managers” to educate staff and help manage products reaching the end of their marketable life, donation of edible unsold products, and collection of organic waste for composting.	Sustainability Lead	Short-term
	3.1	Update existing County Community Development loans and grants to include energy efficiency improvements as eligible costs. Update grant scoring rubrics to include bonus points for project components related to energy efficiency and sustainability. Establish a grant specifically tailored to support businesses in implementing energy efficiency and sustainability-related projects.	Community Development, Sustainability Lead	Short-term

Goal 3. Support businesses that prioritize sustainability and aim to reduce the environmental impact of their operations.	3.2	Work with distribution and other refrigeration users in La Crosse to voluntarily phase out refrigerants with high ozone depletion and global warming potential in advance of US EPA phaseout. Explore rebates for improving refrigeration efficiency.	Sustainability Lead	Mid-term
	3.3	Require recycling and diversion of waste created by demolition projects funded by the County's Housing Acquisition & Demolition Grant.	Community Development, Sustainability Lead	Short-term
	3.4	Market the Property Assessed Clean Energy (PACE) Program. Assist business owners with pursuit of PACE funds for energy upgrades.	Community Development, Sustainability Lead	Ongoing
	3.5	Promote commercial and industrial energy efficiency audit and upgrade programs. Develop energy efficiency programs for businesses that don't own their own building. Use the Minnesota Chamber of Commerce's Energy Smart program as a model. Goal: 10% of commercial/ industrial buildings by 2030 achieving a 20% efficiency increase per location.	Sustainability Lead	Mid-term

Appendix C:

Climate Background

Climate Background

The 10 warmest years in the historical record have occurred since 2010. Globally, 2023 was the hottest year on record (Lindsey, R. & Dahlman, L., 2024). Figure B1 represents Global Temperature differences compared to the 1901-2010 average. These changes are going to impact local resources and sustainability, and La Crosse County must be prepared.

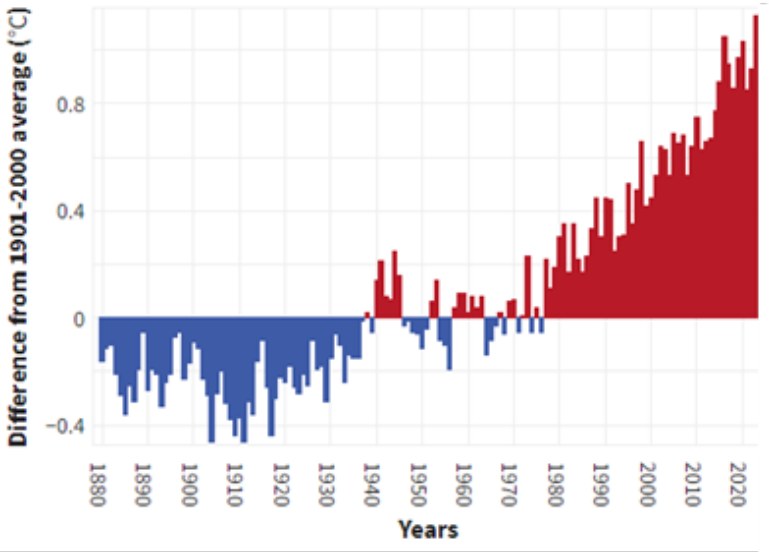
Scientific models project that by the end of this century, global temperatures may increase as much as 10.2 degrees Fahrenheit (F) above the 1901-1960 average temperature (Lindsey, R. & Dahlman, L., 2024). Between 1880 and 2012, global climate warmed about 0.92 degrees Centigrade (Cg), or 1.66 degrees F (U.S. Energy Information Administration, 2022). 2023 climate estimates project there will likely be a temperature increase of 2.3 - 3.4 degrees Celsius (C) (4.1 – 6.1 degrees F) by the year 2100 (Rhodium Group Climate Outlook, 2023). If immediate, widespread changes are not made in the next few decades to reduce GHG emissions, limiting warming to a 1.5 - 2 degree C (2.7 – 3.6 F) increase will be unlikely (Intergovernmental Panel on Climate Change, 2021). Emissions often enter the atmosphere as a consequence of natural environmental processes or fuel combustion to generate energy for humans.

If immediate changes are not made to reduce GHG emissions, limiting global warming to a 4.1 – 6.1 F increase by 2100 will be unlikely.

Wisconsin can expect to experience several impacts of climate change:

- As of 2023, Wisconsin's temperatures have increase by 3 degrees F since the 1950's, and projections indicate it will be 2 – 8 F warmer in the Badger State by 2050 (McCoy, M.K., 2020).
- By the 2050's, Wisconsin can expect 3 times as many days hotter than 90 F and 4 times as many days with nighttime lows of 70 degrees F (Kaeding, D., 2023a).
- In the last 10 years, precipitation in Wisconsin has increased by 17% (5 inches) (Wisconsin Initiative on Climate Change Impacts, 2022).
- The Driftless Area will be negatively impacted by increased flooding and damaged infrastructure because of flooding (Wisconsin Initiative on Climate Change Impacts, 2022).

Figure B1. Global temperature difference. NOAA, climate.gov.



While climate change has occurred intermittently over the last 4.5 billion years, it has never changed at the rate that has been observed since the Industrial Revolution (Scott, M. & Lindsey, R., 2023). The earth has been warming over the last 150 years at a rate unprecedented compared to the last 800,000 years (Scott, M. & Lindsey, R., 2023).

Climate change is a symptom of past and present excessive human consumption and production of GHGs globally. Beginning with the Industrial Revolution in the late 1700's, human development and industrial activities across the globe have become increasingly unsustainable. More recently, impacts to earth's ecological balance and climate have become more severe, and consumption has strained the availability of natural resources. During the last 50 years, the global population has doubled, and economic activity has increased five-fold (Project Drawdown, 2021). As a result:

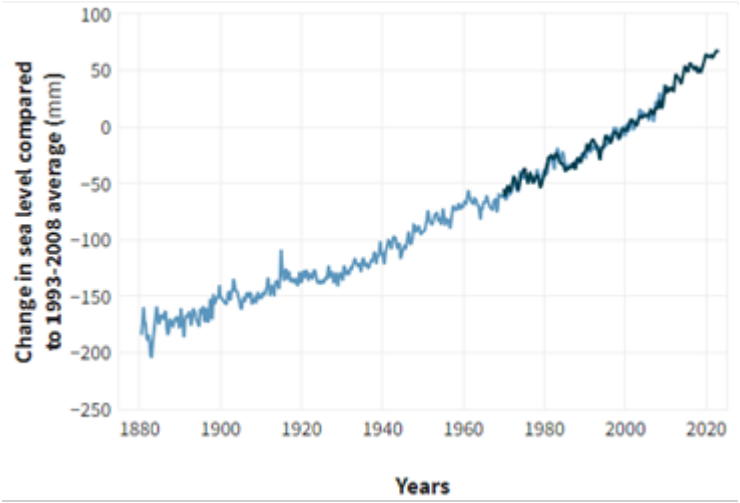
- Food demand has tripled.
- Water use has nearly doubled.
- Fossil fuel demands have nearly tripled.
- 15% of tropical forests, which are valuable carbon sinks that absorb harmful GHGs, have been lost to deforestation.

Also due to climate change, resource demand, and habitat destruction, animal populations have declined by 69% during the last 50 years and 44% of known species are estimated to be at risk of extinction (Almond, Et al., 2022). Significant climate change that will reduce the ability to sustain life on the Earth can be mitigated through near-term global emissions reductions.

Modern processes for resource extraction, widespread use of chemicals in agriculture and industrial production, and emissions produced by fossil-fueled modes of transportation and generation of electricity have expelled trillions of tons of GHGs into the atmosphere. Sprawling land use patterns exacerbate the impacts of many sources of emissions. Types of GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (NO2), and fluorinated gases among others. While most of these gases occur naturally, most of them that are present in our atmosphere are a consequence of human actions.

In 2021, 6,340,000 tons of CO2 were emitted by the United States alone (EPA, 2022). For reference, just 1 metric ton of GHGs would fill a balloon measuring 33 feet in diameter. The BRIC nations (Brazil, Russia, India, and China), which the United States conducts a significant amount of trade with the United States, account for 50.4% of global emissions (Crippa, et al.). China alone produced 29.16% of global emissions in 2022 (Crippa, et al.). In 2022, the United States

Figure B2. Change in sea level. Source: NOAA, climate.gov.



was the second highest producer of GHG emissions (11.19% of global emissions) (Crippa, et al.). The United States per capita emissions are 17th highest in the world (17.9 tons of CO2 equivalent per year), ranking behind many wealthy nations located in the Persian Gulf (Crippa, et al.)..

Figure B2 represents recent global GHG increases. GHGs, when emitted in excessive amounts, linger in the atmosphere, and they've increased the average surface temperature of the planet by 1 degree Celsius (33.8 degrees F) above the 20th century average (Project Drawdown, 2021). Rapid warming of the planet has also increased sea level rise (see Figure B3), increased ocean temperatures, caused longer droughts and heat waves, reduced snow cover (see Figure B4) and glacier mass, and increased the frequency of disasters, threatening millions of lives and billions of dollars in property value (Lubben, A., 2022). Since 1880, global average sea level has risen 8 to 9 inches (Lindsey, R., 2022). The global rate of sea level rise doubled from 2006 to 2015, rising 0.14 inches every year (Lindsey, R., 2022).. This rise has resulted in high tide flooding that's estimated to be 300% to 900% more frequent than it was 50 years ago (Lindsey, R., 2022).

Project Drawdown, a non-profit coalition of researchers and educators, created the graphic below, which broadly categorizes the current, primary global GHG emissions sources and the natural emissions/carbon sinks that offset emissions (see Figure B5). Examples of natural sinks include forests, vegetation, fungi, large waterbodies, and soils. Increasing carbon sinks is often referred to as "carbon sequestration". Global climate change can be slowed through climate

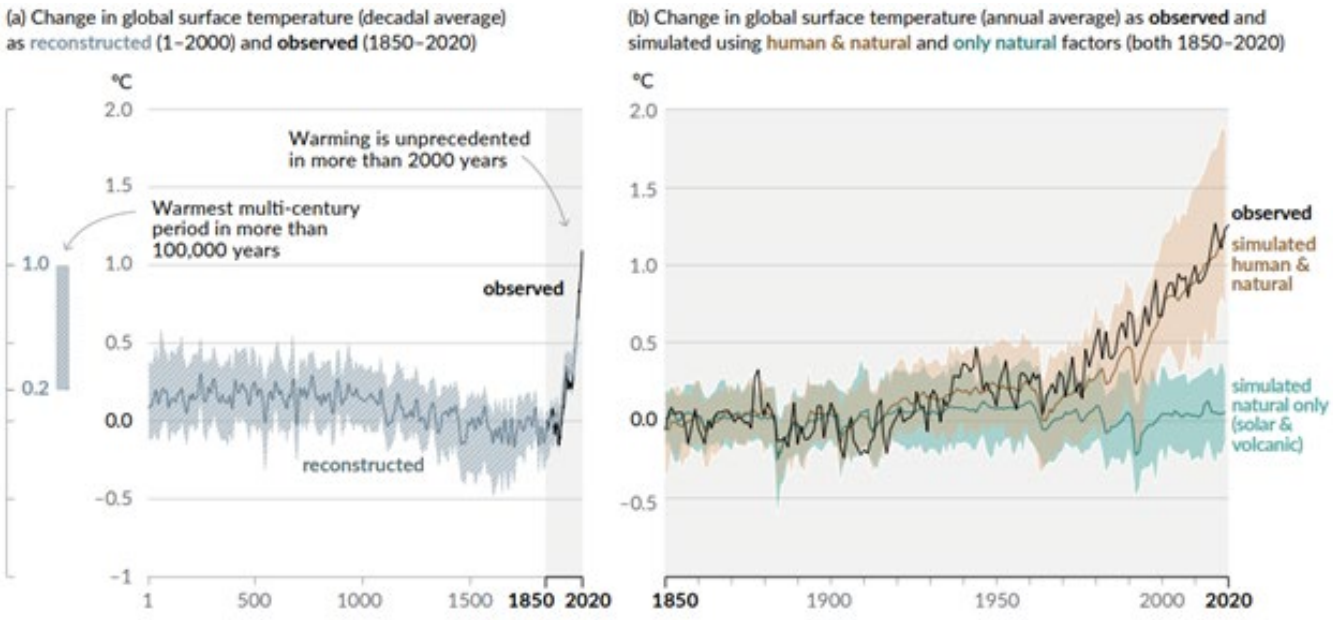
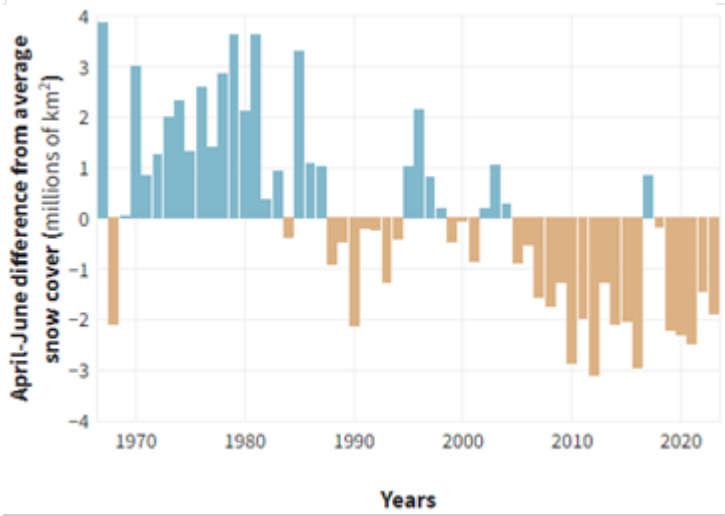


Figure B3. Projected changes in global surface temperatures relative to 1850-1900. Source: Intergovernmental Panel on Climate Change (2021)

Figure B4. Global snow cover extent. Source: NOAA, climate.gov. Data: Rutgers Snow Lab.



action that reduces sources of emissions or expands natural sinks. While there is wide variability among data sources based on tree species and other variables, it is estimated that 6 to 39 trees need to be planted to offset 1 ton of CO2 equivalent emissions. To absorb just 1 American's annual CO2 equivalent emissions (17.9 tons), based on 2022 per capita estimates, 108 to 687 trees would need to be planted as carbon sinks.

Figure B5. Source: Project Drawdown.

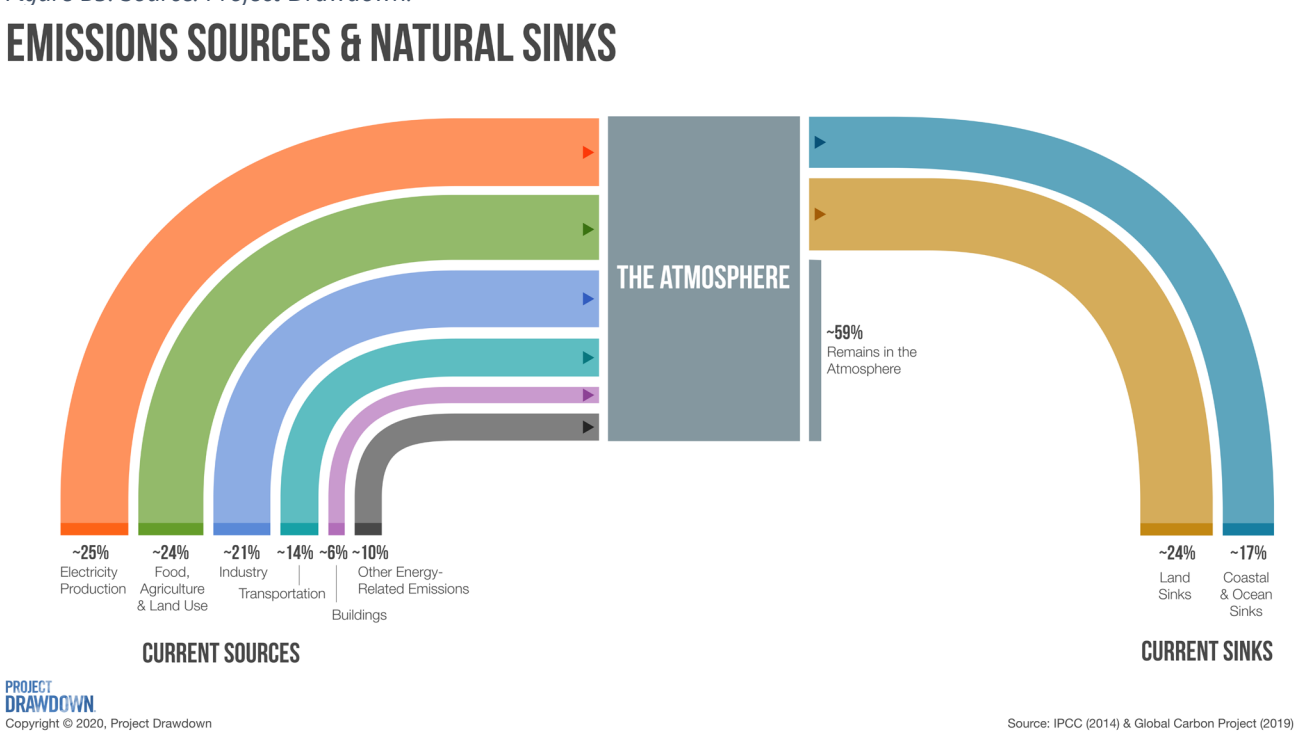


Figure B6 breaks down primary sources of emissions. More than half of global emissions are from energy use related to these sources. Coal accounts for 38% of global energy demand, and it is still widely used in energy plants in the United States. The United States' current fossil fuel dependence also presents threats to the country's economy and national security. Thankfully, public and private sector officials have acted to reduce coal use faster than previously expected in the United States (24%) and the European Union (16%) between 2022 and 2023 (IEA, 2023). The United States' reduction in the use of coal is partly due to transitioning to renewable energy sources like wind and solar. However, much of the reduction in consumption is due to transitioning to "natural" gas. Natural gas contains methane, which may linger in the atmosphere 1/10 as long as CO2, but it's 30 times more effective at holding heat in the atmosphere than CO2, which greatly exacerbates the greenhouse gas effect causing climate change (Zielinski, S., 2014). The greenhouse gas effect is illustrated in Figure B7.

If climate action is taken now, and global carbon neutrality were reached by 2050, 94% of projected future GHG emissions could be mitigated (Project Drawdown, 2021).

To absorb just 1 American's annual CO2 equivalent emissions (17.9 tons), ... 108 to 687 trees would need to be planted...

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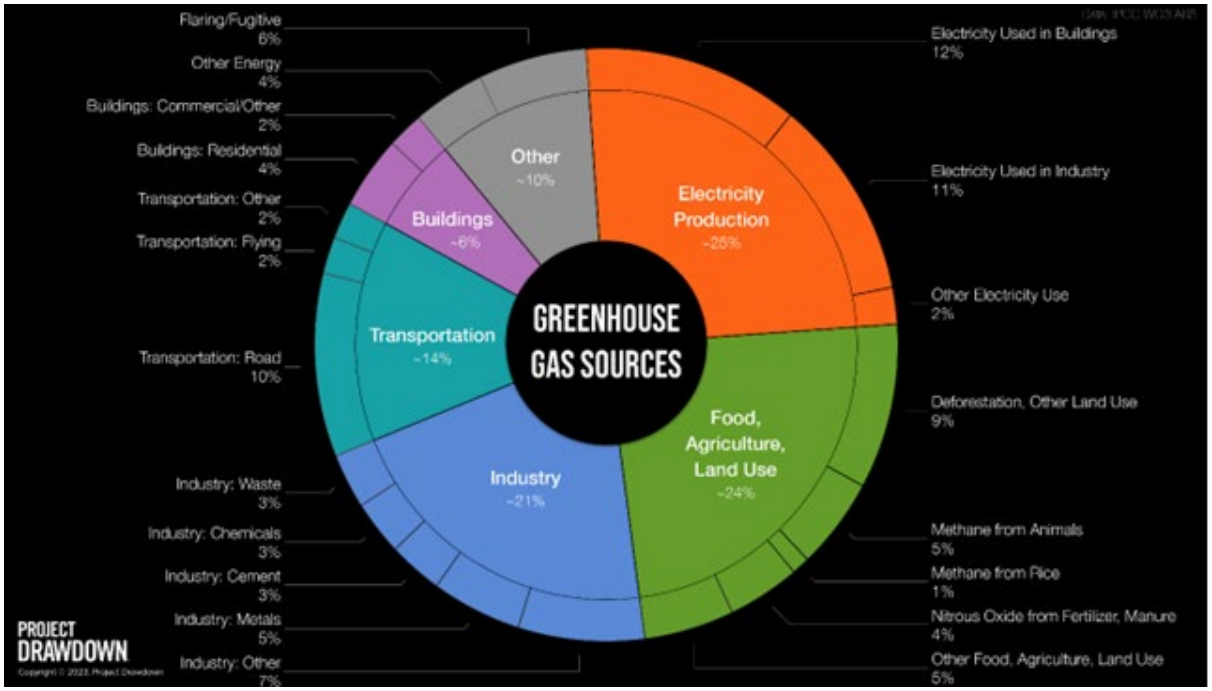

Figure B6. GHG Sources. Source: Project Drawdown.

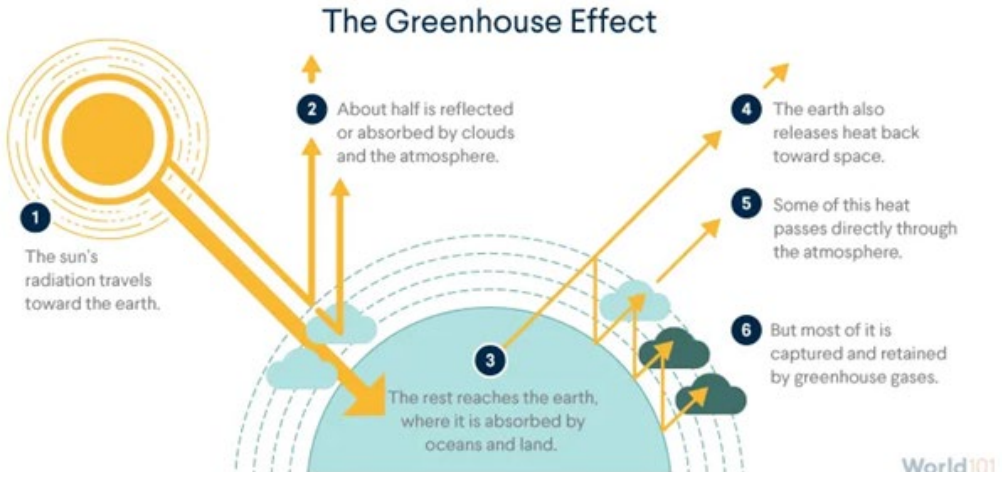

Figure B7. Source: World 101, Council on Foreign Relations.

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Appendix D:

Nitrate Task Force

POLICY PROPOSAL

Reduce human exposure to well water nitrate in two La Crosse County townships.

La Crosse County Health Department developed a local task force to identify root causes of nitrate contamination in private wells located in the Towns of Holland and Onalaska. The task force evaluated and selected public policy recommendations to reduce human exposure to nitrate in drinking water. Laboratory testing conducted in 2017 indicated a significant number of the 10,000 residents were using drinking water above state and federal nitrate standards.

Defining the Problem

Main Policy Question:

How can La Crosse County Health Department and others reduce the number of residents exposed to well water exceeding the nitrate health standard?

Problem Trajectory – Agricultural Sources of Nitrogen

Background:

In July 2016, La Crosse County Health Department staff reviewed the Wisconsin Legislative Audit Bureau report "Wastewater Permitting and Enforcement" which evaluated the Wisconsin Pollutant Discharge Elimination System (WPDES) program administered by the Wisconsin Department of Natural Resources (WDNR). The audit found circumstances where WDNR did not adequately monitor pollution data and did not take enforcement actions to protect surface and ground waters. One violation mentioned in the audit report concerned a Concentrated Animal Feeding Operation (CAFO) located in La Crosse County near Holmen, WI. The majority of the CAFO's groundwater monitoring well samples collected between 2005 and 2016 exceeded the drinking the water standard for nitrate-nitrogen (10mg/L). After reviewing monitor well data, La Crosse County Health Department sent Health Advisory letters to all residents in the Towns of Holland and Onalaska recommending immediate well water testing for nitrate and coliform bacteria. By the June 2017, more than 540 wells were tested by La Crosse County Health Laboratory. Thirty percent (30%) of these wells exceeded the federal nitrate standard of 10 mg/L nitrate-nitrogen and 60% were 5.0 mg/L or greater indicating widespread groundwater pollution from human activities. A statewide survey of agricultural chemicals in Wisconsin groundwater conducted between March and August 2016 estimated 8.2 % of wells were above 10 mg/L.

Nitrate is a public health concern because of the potential harmful effects of exposure in contaminated drinking water. The illness methemoglobinemia occurs when infants ingest excessive nitrate. Also known as "Blue Baby Syndrome", excess nitrate interferes with the oxygen-carrying capacity of the blood creating an oxygen deficiency which can be fatal. The federal drinking water standard of 10 mg/L of nitrate-nitrogen was established in 1977 because of this condition. Although all health effects of chronic nitrate exposure are not well understood, epidemiological studies have identified an association between consumption of water with high nitrate levels and other adverse human health outcomes

including problems with thyroid function, diabetes, and birth defects among children of mothers exposed during pregnancy.

Agriculture and Nitrate:

The Towns of Holland and Onalaska are home to 9,436 residents and contain 16,000 acres of agricultural land. Groundwater is the sole source of drinking water and most private wells obtain water from an unconfined shallow sand-and-gravel aquifer which is 10-20 feet below the surface and 200 feet thick. Groundwater moves through the aquifer at three feet per day in a southwest direction toward the Mississippi River. The sand-and-gravel aquifer is more permeable than the underlying sandstone aquifer. The permeable soil and shallow aquifer conditions increase groundwater vulnerability to contamination from manure, fertilizers and private septic systems. Contaminants infiltrate the groundwater where they move quickly through the permeable substrate material and enter drinking water wells. Municipal sewer and water service is not currently available to these residents. More than 94% of the wells tested by LCHD were less than 150 feet deep. Figure 1.

Satellite imaging shows significant cropland acreage in both townships. The Bureau of Agrichemical Management of the Wisconsin Department of Agriculture & Consumer Protection reported 856,000 tons of nitrogen fertilizers were used by Wisconsin farmers from July 2015 to June 2016. Plants use nitrogen most efficiently when the producer applies it as close as possible to the time of crop uptake. Good nitrogen management involves supplying the right amount at the right time for crop needs. Lack of sufficient nitrogen reduces crop yields, but any nitrogen in excess is subject to leaching to groundwater. Studies show even small amounts of over-fertilization increased nitrate levels above drinking water standards.

In Wisconsin, 90% of the groundwater nitrate contamination is estimated to have originated from agriculture, 9% from septic systems, and 1% from other sources. In 2016 the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) and the Wisconsin Field Office of the National Agricultural Statistics Service (NASS) conducted a survey of agricultural chemicals in Wisconsin groundwater. Four hundred private drinking water wells were selected for testing using a random sampling procedure. Samples were analyzed for 101 different compounds, including herbicides, herbicide metabolites, insecticides, fungicides, and nitrate-nitrogen. Eight percent (8%) of the wells exceeded the nitrate-nitrogen standard of 10 mg/L.

Wisconsin Act 27 was created in 1997 to respond to growing public concern over water pollution from farm runoff and provided the framework for regulation of animal waste from livestock operations. The La Crosse County Department of Land Conservation is charged with the responsibility of protecting and enhancing the soil and water resources of the County. There are 170,000 acres of farmland in the La Crosse County, most of which is cropped for feeding dairy cattle or for cash grain. A County zoning ordinance regulates farms with 200 or more animal units through a permitting process. The County uses Wisconsin Chapter ATCP 51 Livestock Facility Siting regulations to review farming operations along with the Animal Waste Management Ordinance adopted in 1998. The ordinance regulates the construction and operation of animal feedlots and manure storage facilities and enforces Wisconsin Chapter NR 151 Runoff Management. County staff also provide nutrient management planning assistance to farmers seeking compliance with conservation standards. The goal is to provide the correct amount of nutrient needed by crops and limit the amount of nitrogen lost to groundwater and runoff.

Concentrated Animal Feeding Operations (CAFOs) are agricultural meat, dairy, or egg facilities where animals are kept and raised in confined conditions. In Wisconsin, CAFOs are defined as farms with at least 1000 animal units. Because the animals do not graze or seek feed in pastures, large volumes of manure and urine accumulate in small areas posing significant challenges to environmental protection. CAFOs must provide at least six months of manure storage capacity which is accomplished through construction of holding tanks, collection basins or lagoons. Animal waste is spread on lands near the CAFO where it is used to fertilize crops. The cropland must be in close proximity to the CAFO to make manure disposal economically feasible. Land spreading manure may impact surface and groundwater and increases the risk of private well water contamination.

There is one CAFO located within the Town of Onalaska. Babcock Genetics Inc. operates a swine CAFO that finishes 7,000 pigs annually. Fecal matter is moved daily into deep pit collection basins and collection pits. Manure is then sent to a 2-stage lagoon where it is eventually irrigated on adjacent lands during the spring and summer months. Manure application rates are determined by the manure nutrient content, soil nutrient level and the type of crop grown. Land spreading is done in accordance with Babcock Genetics' nutrient management plan and is regulated by the WDNR through the WPDES program. Babcock Genetics' 2017 annual report stated 10,000,000 gallons of liquid swine manure was spread over 327 acres on Dummer Family Farms from June-August 2017.

There were six groundwater monitoring wells located at Babcock Genetics and each was sampled three times during 2017 for a total of 18 samples. Nitrate levels ranged between 2.81 - 38.1 mg/L with 14 of the 18 samples exceeding 10 mg/L. This is similar to the data collected from the same monitoring wells between 2010 and 2016. The monitoring wells are shallow and vary from 21.04 to 30.93 feet in depth to groundwater. The monitoring wells are positioned to collect groundwater as it enters the CAFO and as it leaves the property to determine the impact of the operation. Not all CAFOs are required to conduct groundwater monitoring. The monitoring well data suggests Babcock Genetics has an impact on groundwater but to what extent remains unknown. It is reasonable to assume the spreading of millions of gallons of swine manure on nearby croplands with permeable soil characteristics must impact the amount of nitrate leaching to the aquifer. WDNR officials have made it abundantly clear that current Wisconsin laws are not intended to hold agricultural operations to the nitrate drinking water standard. NR 151 "Runoff Management" states the following;

"NR 151.004 State targeted performance standards. Implementation of the statewide performance standards and prohibitions in this chapter may not be sufficient to achieve water quality standards under chs. NR 102 to 105 or groundwater standards under ch. NR 140."

Wisconsin Chapter NR 140 establishes groundwater quality standards for substances of public health concern including nitrate.

Problem Trajectory – Private Septic Systems

La Crosse County Health Department estimates there are 3,000 private septic systems within the two townships. The primary concern regarding wastewater systems is the effect they have on nitrate levels in groundwater. Conventional systems are not designed to remove much nitrate or any other chemical from wastewater. Nitrate concentrations in groundwater usually exceed the drinking water standard of

10 mg/L near septic drainfields. A high density of septic systems is more likely to cause local groundwater contamination than a single system. Studies have shown effluent can remain a distinct plume for as much as several hundred feet. If not properly located or maintained, on-site sewage systems can significantly pollute groundwater in nearby wells. Some community members in Holland expressed concerned that sandy soil conditions existing throughout the town may predispose the town to increased occurrences of groundwater pollution.

An average-sized household using a septic system generates about 25 pounds of nitrogen annually. For all onsite septic systems nationally, this amounts to about 260,000 tons of nitrogen released per year. By comparison, chemical fertilizers amount to more than 12,000,000 tons of nitrogen. Nitrogen removal in wastewater varies depending on the type of waste, concentration, and type of system used to treat it. About 75-90% of nitrogen in household wastewater comes from toilet wastes and approximately 90% of that is from urine. Nitrogen concentrations generally range 50-60 mg/L in domestic wastewater. Some nitrogen entering the septic tank is removed when the scum and solids are pumped from the tank during routine maintenance. The concentration of total nitrogen in septic tank effluent is quite variable, ranging from 20-200 mg/L. Studies of groundwater below septic drainfields found 10-25 percent of nitrogen was removed from wastewater.

Processes for reducing nitrogen concentrations in discharges of treated sewage from large centralized wastewater treatment plants are well developed. The processes used at larger facilities are not practical for use in private onsite septic systems serving individual residences. Existing technologies for private onsite treatment to remove nitrate can be grouped into four main categories; (1) biological nitrification and denitrification, (2) source separation of urine, (3) physical/chemical removal, and (4) removal by natural systems such as constructed wetlands.

Currently, about half of the states regulate nitrogen from private onsite septic systems. In states that regulate nitrogen from single-family homes, regulations typically apply only to those located in certain regions with groundwater problems or those near nitrogen-sensitive bodies of water. For example, in Massachusetts the Department of Environmental Protection has designated “nitrogen-sensitive areas” in which new nitrogen discharges must be limited. Designation of these areas is based on ecological sensitivity and relative risk of threats to drinking water wells. Nitrogen treatment technology will add $10,000- 20,000 to the cost of a private septic system.

In Wisconsin, private systems are regulated through Chapter SPS 383 “Private Onsite Wastewater Treatment Systems.” The administrative rule exempts private septic systems from meeting groundwater standards for drinking water. However, SPS 383(5) does not limit municipalities from establishing nitrate standards in local zoning ordinances.

“SPS 383(4). GROUNDWATER STANDARDS. (a) Pursuant to s. 160.255, Stats., the design, installation, use or maintenance of a POWTS is not required to comply with the nitrate standard specified in ch. NR 140 Table 1, except as provided under sub. (5).

SPS 383(5). LOCAL ORDINANCES. (a) Pursuant to ss. 59.70 (5) (a), 145.02 (2) and 145.13, Stats., this chapter is uniform in application and a governmental unit may not enact an ordinance for the design, installation, inspection and management of a POWTS which is more or less stringent than this chapter, except as specifically permitted by rule. (b) Except as provided in s. SPS 383.25 (1) (b), a governmental unit shall submit to the department any proposed ordinance or proposed ordinance revision relating to

POWTS. The proposed ordinance or revision shall be submitted for review a minimum of 30 calendar days prior to the first scheduled public hearing date regarding the ordinance. Note: Pursuant to ss. 59.69, 60.62, 61.35 and 62.23, Stats., this chapter does not affect municipal authority for zoning, including establishing nitrate standards as part of a zoning ordinance to encourage the protection of groundwater resources."

The planning of rural subdivisions with large on-site systems or clusters of on-site systems should include an evaluation of drinking water wells to ensure they are protected from sources of contamination. If the evaluation finds a risk, alternatives such as protected water supplies (i.e. mandatory well location and depth), nitrogen-reducing private septic systems, or community water supply and wastewater treatment should be explored.

Public health and environmental risks from properly sited, designed, constructed, and operated septic tank systems appear to be low. However, soils with excessive permeability, low organic matter, low pH, and high moisture content can increase health and environmental risks under certain circumstances.

Policy Options

La Crosse County Health Department developed and organized a task force made up of township citizens and key County Departments from Public Health, Land Conservation, UW- Extension, and Planning to address the nitrate problem. The Nitrate Well Water Task Force (NWWTF) met monthly from December 2017 to June 2018 and was charged with developing public policy directed at reducing human exposure to nitrate in drinking water wells in the Towns of Holland and Onalaska. The NWWTF met with experts from agriculture, USGS, and municipal public works to study the issue and develop strategies. A comprehensive literature review was conducted to determine how others were handling nitrate problems across the country. A list of potential public policies was developed. Table 1.

Policy Recommendations

The Nitrate Well Water Task Force met on June 6, 2018 and reviewed the policies in Table 1. The NWWTF recommended the following public policies be implemented to reduce human exposure to nitrate in private well water;

1. Develop processes to inform current and potential residents of the nitrate contamination hazard through realtors, builders, county and municipal governments.
2. Extend municipal water systems from the Village of Holmen and City of Onalaska to existing residential developments where cost effective.
3. Allow new residential developments in the Towns of Holland and Onalaska in areas where homes can be connected to public water systems or protected community wells.
4. Rent or purchase lands currently used for row crops and replace with green spaces or land used for recreation.
5. Require green zones in all new subdivisions to protect wells. Green zones are areas with vegetation where no chemicals, manure or other substances are added to the landscape.

Summary

A significant number of La Crosse County residents are exposed daily to harmful contaminants in their drinking water. Nitrate is the most common contaminant and exists as an unfortunate legacy of past land use and weak attempts to protect groundwater. It will be many decades before groundwater nitrate decreases to safe levels even if all sources were brought under control today. The use of point-of-use treatment devices such as reverse osmosis filtration require constant vigilance and maintenance by the homeowner. New wells continue to be drilled into the same shallow contaminated aquifer exposing new unsuspecting residents to this hazard.

While these challenges seem daunting there are solutions. Reducing the number of people dependent on private wells through utilization of public water utilities, protected deep community wells and zoning regulation offers the opportunity to consume safe water. Local residents, developers, well drillers, farmers and their governments must work together to make it happen. Much more can be done to reduce sources of nitrate through better land use, improved agricultural practices, new septic system technologies, effective environmental regulations and educational strategies to keep the public informed.

Figure 1.

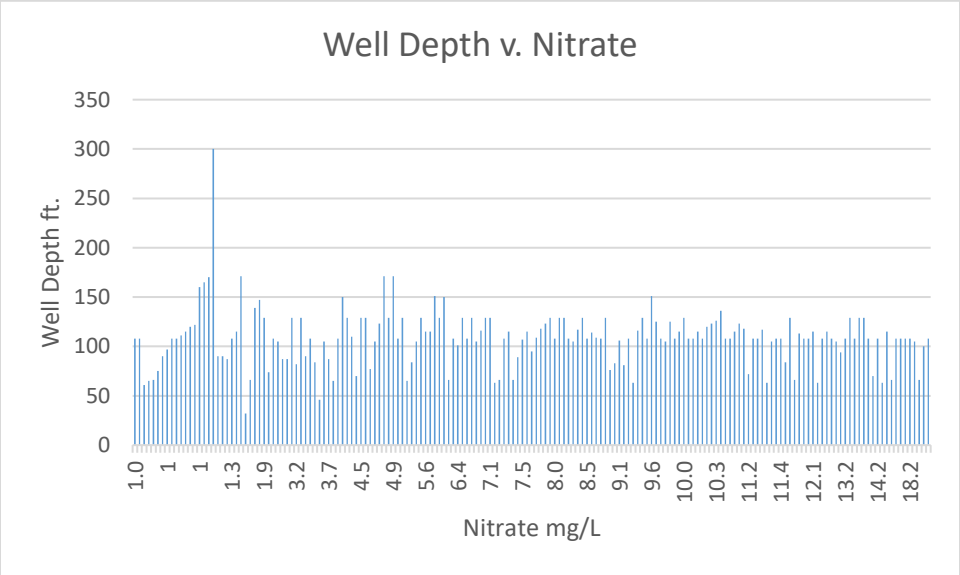

Table 1.

County Government

Use planning and zoning methods to limit residential growth in the Towns of Holland and Onalaska to areas where homes can be connected to public water supplies.

Implement a process to inform potential residents of the nitrate contamination hazard through realtors, builders, county and municipal governments.

Implement an ordinance requiring nitrate reduction treatment devices on all new septic systems installed in high nitrate areas.

Recommend implementation of a fertilizer excise fee to provide incentive to use less.

Designate areas and develop GIS mapping where groundwater resources are at high risk of contamination.

Develop and implement a process to share WPDES compliance information between the WDNR and La Crosse County Health Department.

Seek to revise Wis. Stat. 93.90 to allow local governments to impose more stringent conditions on livestock siting permits to protect groundwater.

Seek to revise WI Administrative Codes ATCP 51 Livestock Facility Siting, NR 243 Animal Feeding Operations and NR 151 Runoff Management to prevent land spreading manure in groundwater sensitive areas.

Seek to revise Administrative Code SPS 383 to allow state regulation of nitrate in private septic system effluent.

Conduct studies in residential areas to determine if nitrate is human or agricultural in origin by testing a series of private wells for artificial sweeteners and alachlor metabolites.

Require periodic nitrate testing of private wells.

Establish a drinking water well monitoring program using homeowner volunteers to determine if nitrate concentrations are increasing or decreasing.

Township and Municipal Governments

Extend water service from Holmen and Onalaska to existing residential developments when cost effective.

Limit residential growth in the Towns of Holland and Onalaska to areas where homes can be connected to public water systems.

Prohibit land spreading of human wastes in groundwater sensitive areas.

State Government

Require nitrate reduction treatment on all new septic systems installed groundwater sensitive areas.

Revise WI Stat. 93.90 to allow local governments to impose more stringent conditions on livestock siting permits to protect groundwater.

Revise WI Administrative Codes ATCP 51 Livestock Facility Siting, NR 243 Animal Feeding Operations and NR 151 Runoff Management to prevent land spreading manure in groundwater sensitive areas.

Revise WI Administrative Code ATCP Chapter 50 to update NRCS 590 standard so farmers may continue participation in the nutrient management program.

Revise Administrative Code SPS 383 to allow regulation of nitrate concentration from private septic system effluent.

Implement a fertilizer excise fee to provide incentive to use less.

Develop and implement a process to share WPDES compliance information between the DNR and La Crosse County Health Department.

Others

Rent or purchase lands currently used for row crops and replace with recreational uses.

Provide financial incentives to change from row crops to crops requiring less nitrogen fertilizers.

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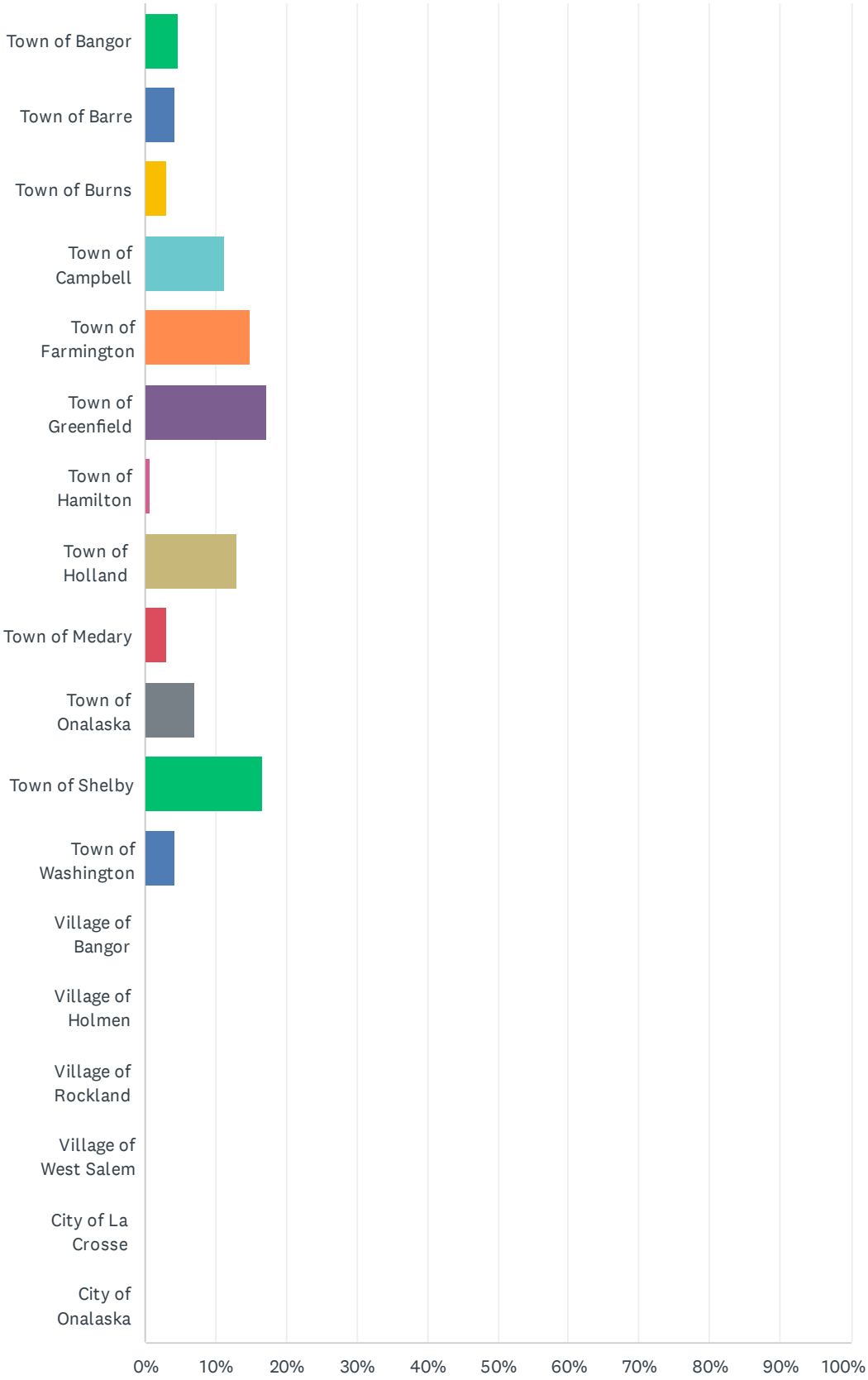
Appendix E:

Town Survey Responses

Q1 Where in La Crosse County do you reside?

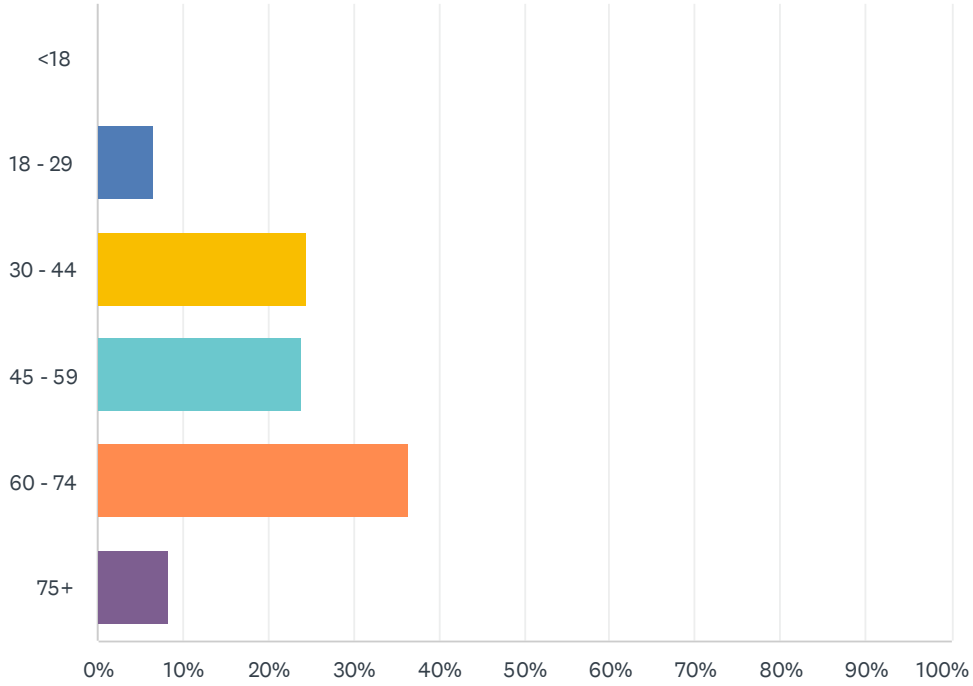
Answered: 168 Skipped: 0


Town of Bangor
Town of Barre
Town of Burns
Town of Campbell
Town of Farmington
Town of Greenfield
Town of Hamilton
Town of Holland
Town of Medary
Town of Onalaska
Town of Shelby
Town of Washington
Village of Bangor
Village of Holmen
Village of Rockland
Village of West Salem
City of La Crosse
City of Onalaska
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
Town of Bangor	4.76%	8
Town of Barre	4.17%	7
Town of Burns	2.98%	5
Town of Campbell	11.31%	19
Town of Farmington	14.88%	25
Town of Greenfield	17.26%	29
Town of Hamilton	0.60%	1
Town of Holland	13.10%	22
Town of Medary	2.98%	5
Town of Onalaska	7.14%	12
Town of Shelby	16.67%	28
Town of Washington	4.17%	7
Village of Bangor	0.00%	0
Village of Holmen	0.00%	0
Village of Rockland	0.00%	0
Village of West Salem	0.00%	0
City of La Crosse	0.00%	0
City of Onalaska	0.00%	0
TOTAL		168

Q2 What is your age?

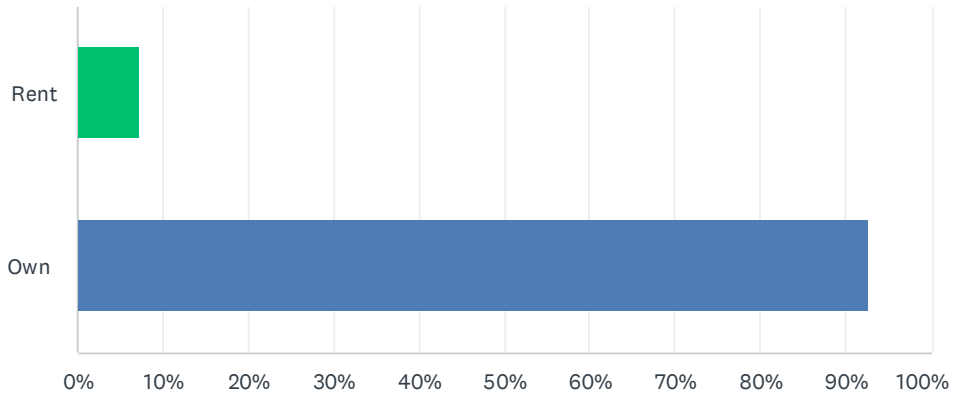
Answered: 167 Skipped: 1



ANSWER CHOICES	RESPONSES	
<18	0.00%	0
18 - 29	6.59%	11
30 - 44	24.55%	41
45 - 59	23.95%	40
60 - 74	36.53%	61
75+	8.38%	14
TOTAL		167

Q3 Do you rent or own your home?

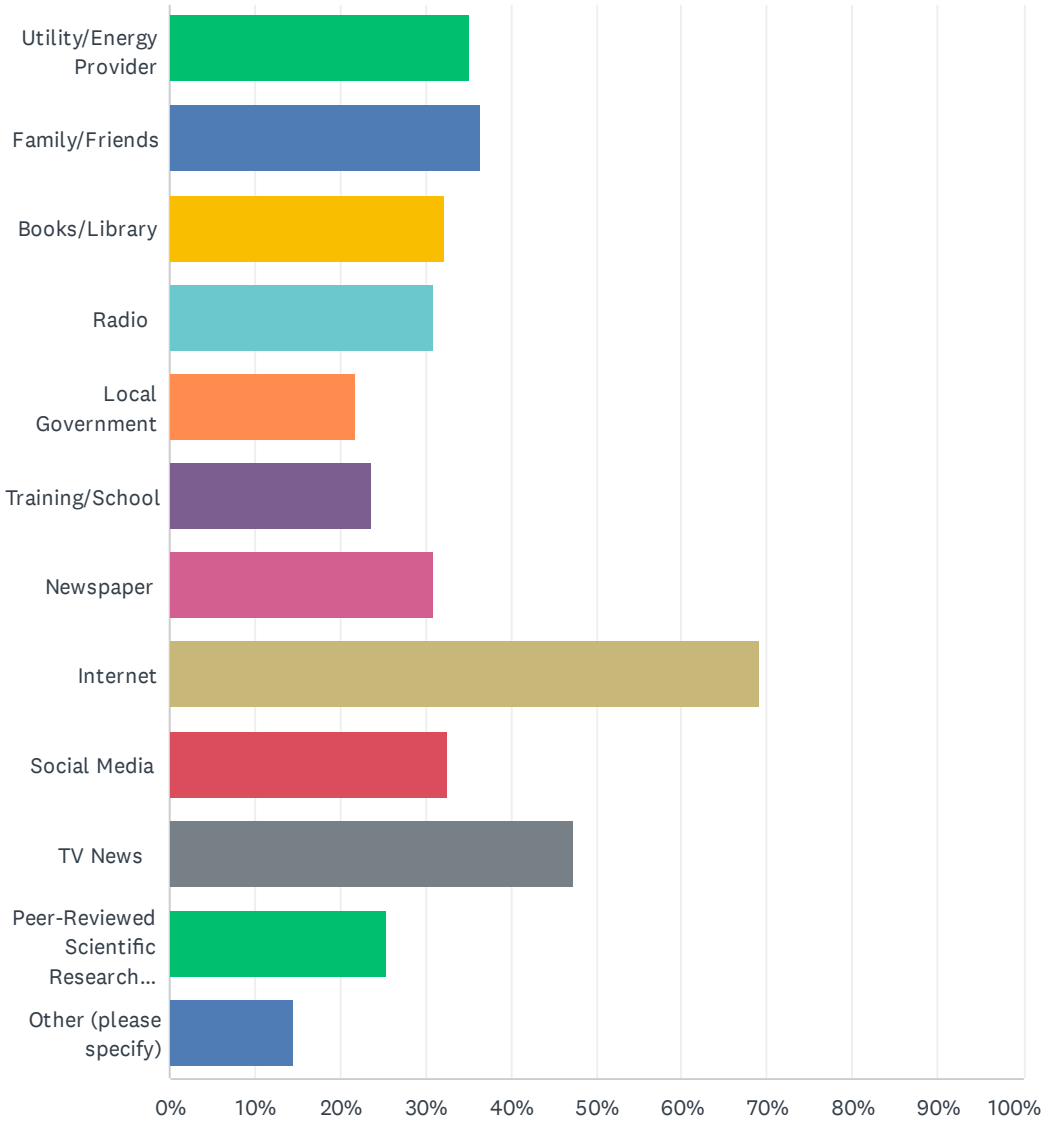
Answered: 167 Skipped: 1



ANSWER CHOICES	RESPONSES	
Rent	7.19%	12
Own	92.81%	155
TOTAL		167

Q4 What sources have helped you understand climate change? (Select all that apply)

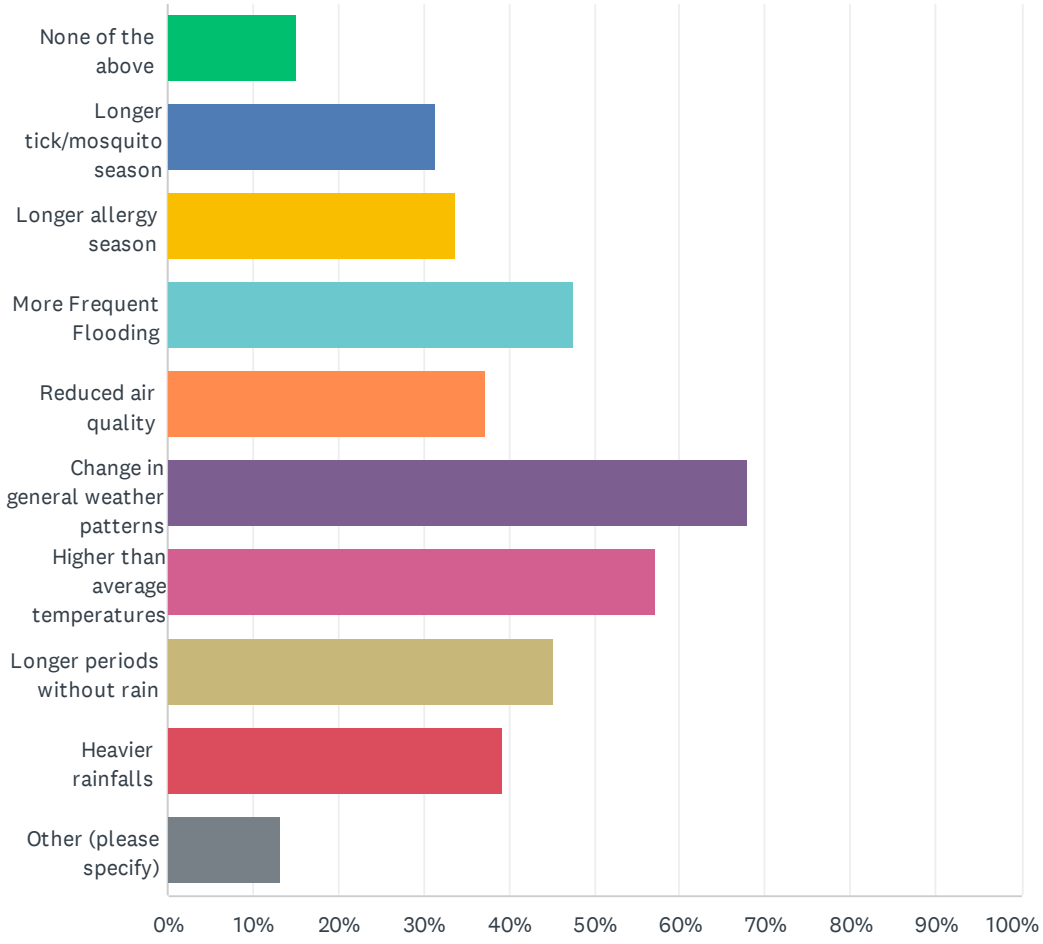
Answered: 165 Skipped: 3



ANSWER CHOICES	RESPONSES	
Utility/Energy Provider	35.15%	58
Family/Friends	36.36%	60
Books/Library	32.12%	53
Radio	30.91%	51
Local Government	21.82%	36
Training/School	23.64%	39
Newspaper	30.91%	51
Internet	69.09%	114
Social Media	32.73%	54
TV News	47.27%	78
Peer-Reviewed Scientific Research Journal Articles	25.45%	42
Other (please specify)	14.55%	24
Total Respondents: 165		

Q5 Have you noticed any of the following? (Select all that apply)

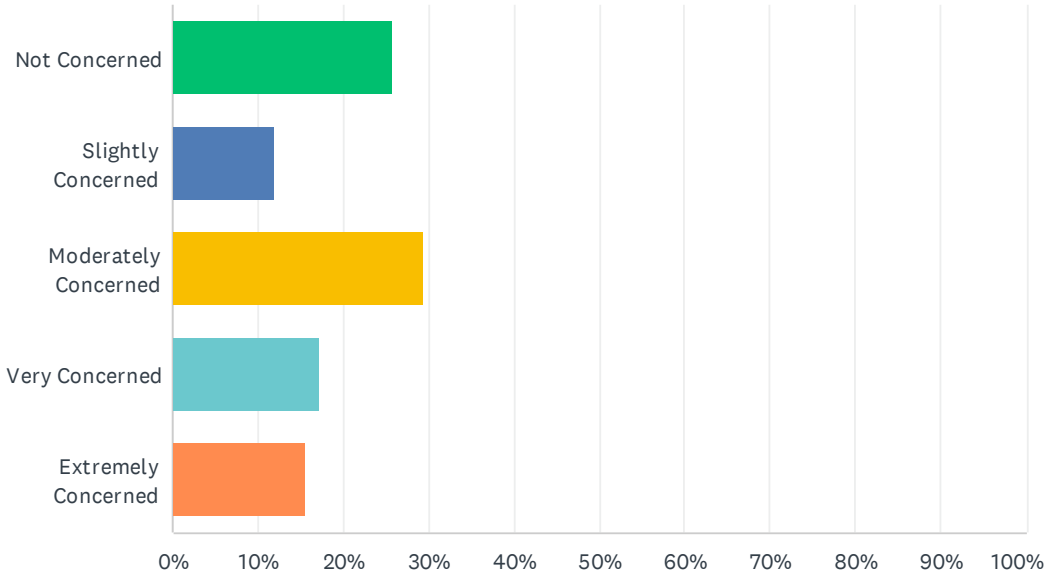
Answered: 166 Skipped: 2



ANSWER CHOICES	RESPONSES	
None of the above	15.06%	25
Longer tick/mosquito season	31.33%	52
Longer allergy season	33.73%	56
More Frequent Flooding	47.59%	79
Reduced air quality	37.35%	62
Change in general weather patterns	68.07%	113
Higher than average temperatures	57.23%	95
Longer periods without rain	45.18%	75
Heavier rainfalls	39.16%	65
Other (please specify)	13.25%	22
Total Respondents: 166		

Q6 How concerned are you about the impacts that climate change will have on the La Crosse County community?

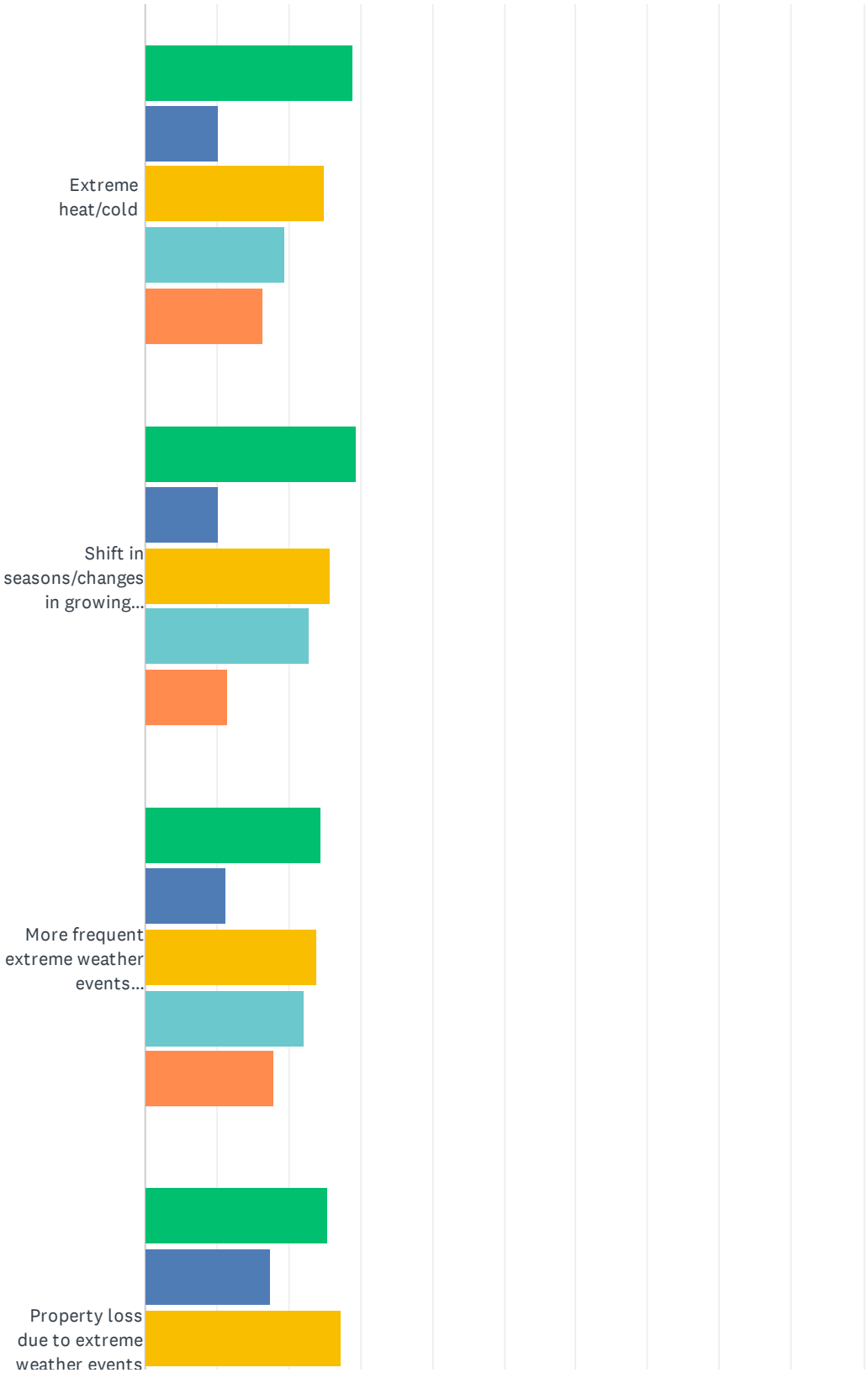
Answered: 167 Skipped: 1

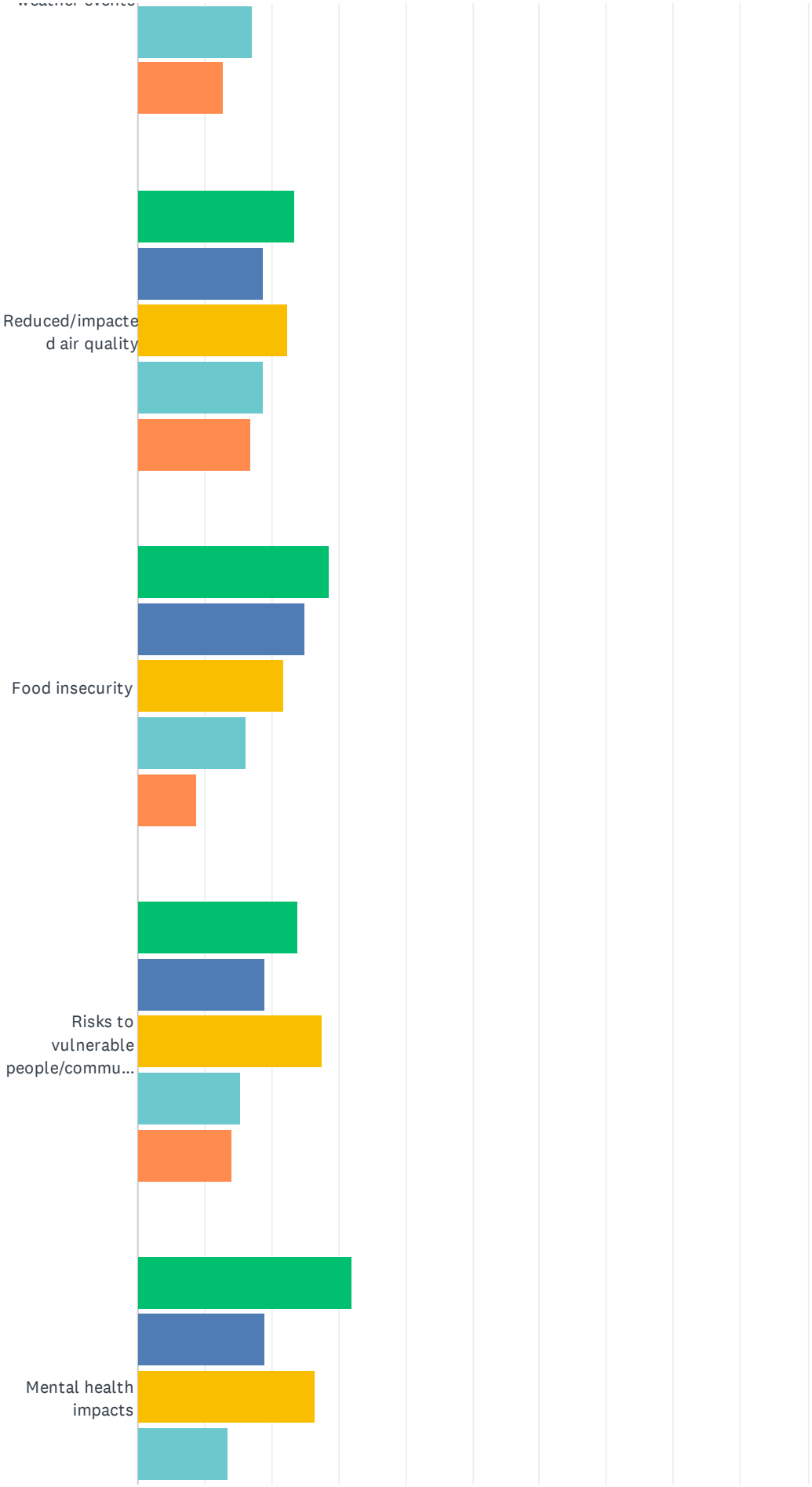


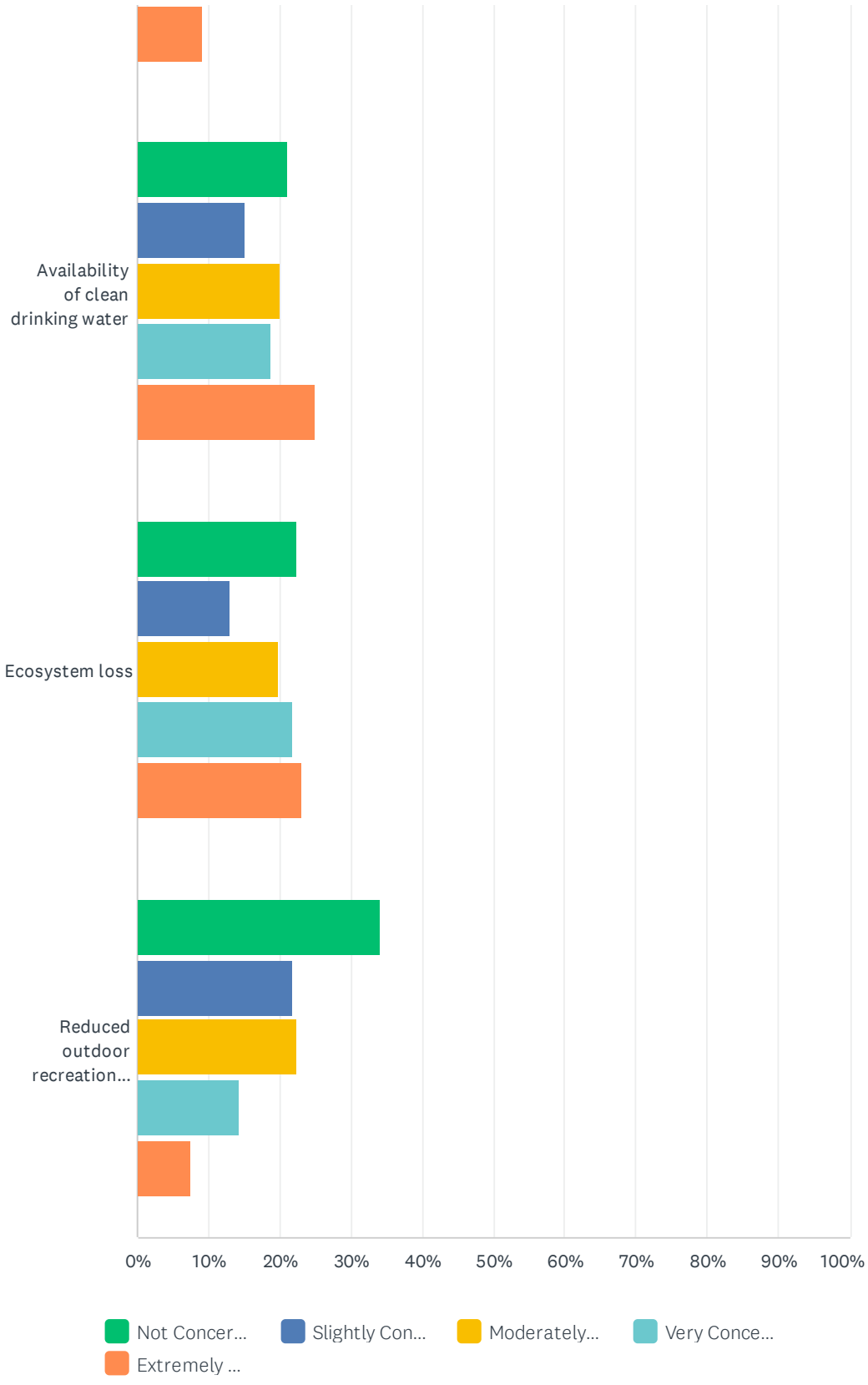
ANSWER CHOICES	RESPONSES	
Not Concerned	25.75%	43
Slightly Concerned	11.98%	20
Moderately Concerned	29.34%	49
Very Concerned	17.37%	29
Extremely Concerned	15.57%	26
TOTAL		167

Q7 How concerned are you about each of the following effects of climate change?

Answered: 167 Skipped: 1




Reduced/impacted air quality
Food insecurity
Risks to vulnerable people/commu...
Mental health impacts


Availability of clean drinking water
Ecosystem loss
Reduced outdoor recreation...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Not Concer...
Slightly Con...
Moderately...
Very Conce...
Extremely ...

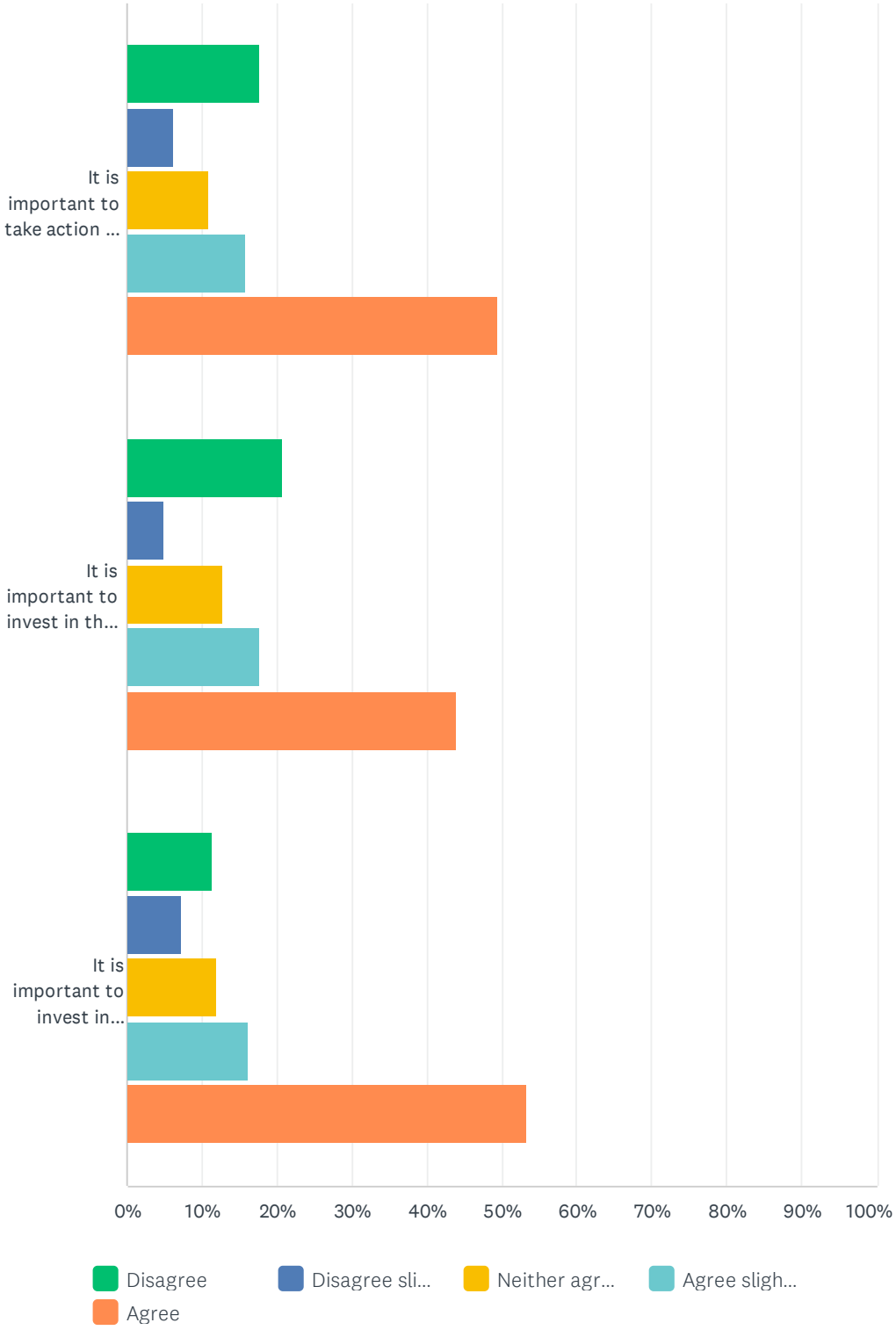
	NOT CONCERNED	SLIGHTLY CONCERNED	MODERATELY CONCERNED	VERY CONCERNED	EXTREMELY CONCERNED	TOTAL
Extreme heat/cold	29.09% 48	10.30% 17	24.85% 41	19.39% 32	16.36% 27	165
Shift in seasons/changes in growing season	29.52% 49	10.24% 17	25.90% 43	22.89% 38	11.45% 19	166
More frequent extreme weather events (blizzards, tornadoes, wildfires, flooding, etc.)	24.55% 41	11.38% 19	23.95% 40	22.16% 37	17.96% 30	167
Property loss due to extreme weather events	25.45% 42	17.58% 29	27.27% 45	16.97% 28	12.73% 21	165
Reduced/impacted air quality	23.49% 39	18.67% 31	22.29% 37	18.67% 31	16.87% 28	166
Food insecurity	28.57% 46	24.84% 40	21.74% 35	16.15% 26	8.70% 14	161
Risks to vulnerable people/communites	23.93% 39	19.02% 31	27.61% 45	15.34% 25	14.11% 23	163
Mental health impacts	31.90% 52	19.02% 31	26.38% 43	13.50% 22	9.20% 15	163
Availability of clean drinking water	21.21% 35	15.15% 25	20.00% 33	18.79% 31	24.85% 41	165
Ecosystem loss	22.36% 36	13.04% 21	19.88% 32	21.74% 35	22.98% 37	161
Reduced outdoor recreation seasons (ex. Winter sports, fishing, skiing, snowmobiling, etc.)	34.16% 55	21.74% 35	22.36% 36	14.29% 23	7.45% 12	161

Q8 What other concerns do you have about the possible impacts of climate change?

Answered: 62 Skipped: 106

Q9 Do you agree or disagree with the following statements?

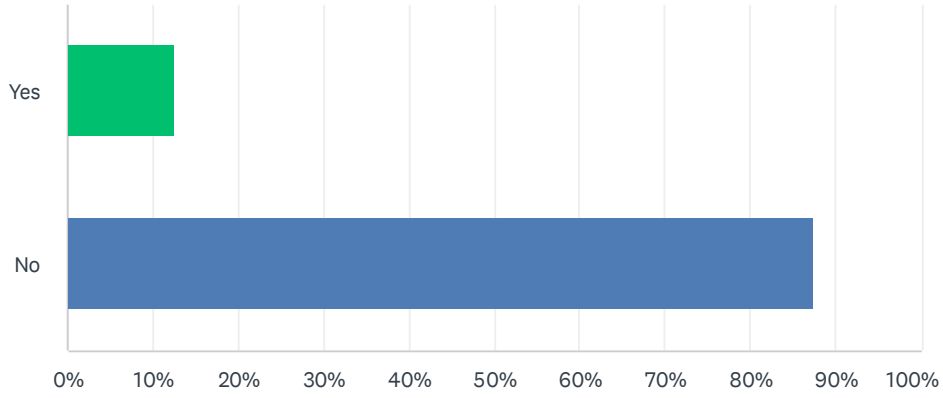
Answered: 167 Skipped: 1



	DISAGREE	DISAGREE SLIGHTLY	NEITHER AGREE NOR DISAGREE	AGREE SLIGHTLY	AGREE	TOTAL
It is important to take action to mitigate and prepare for the potential impacts of climate change.	17.68% 29	6.10% 10	10.98% 18	15.85% 26	49.39% 81	164
It is important to invest in the reduction of greenhouse gas emissions in the community.	20.73% 34	4.88% 8	12.80% 21	17.68% 29	43.90% 72	164
It is important to invest in infrastructure like renewable energy.	11.38% 19	7.19% 12	11.98% 20	16.17% 27	53.29% 89	167

Q10 Has the cost of utilities prevented you from adequately heating or cooling your home?

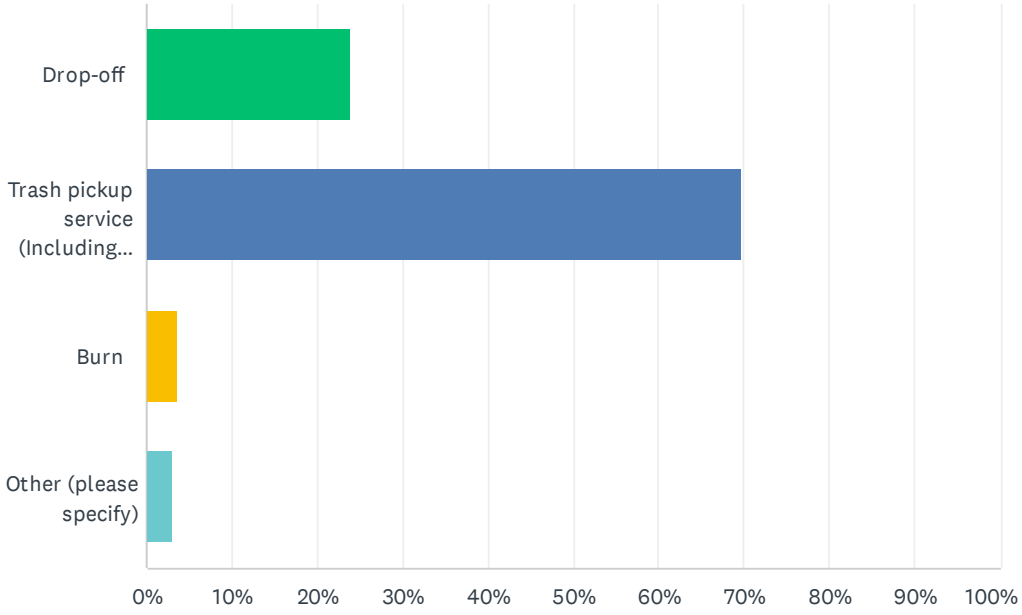
Answered: 168 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	12.50%	21
No	87.50%	147
TOTAL		168

Q11 How do you typically dispose of the majority of your trash?

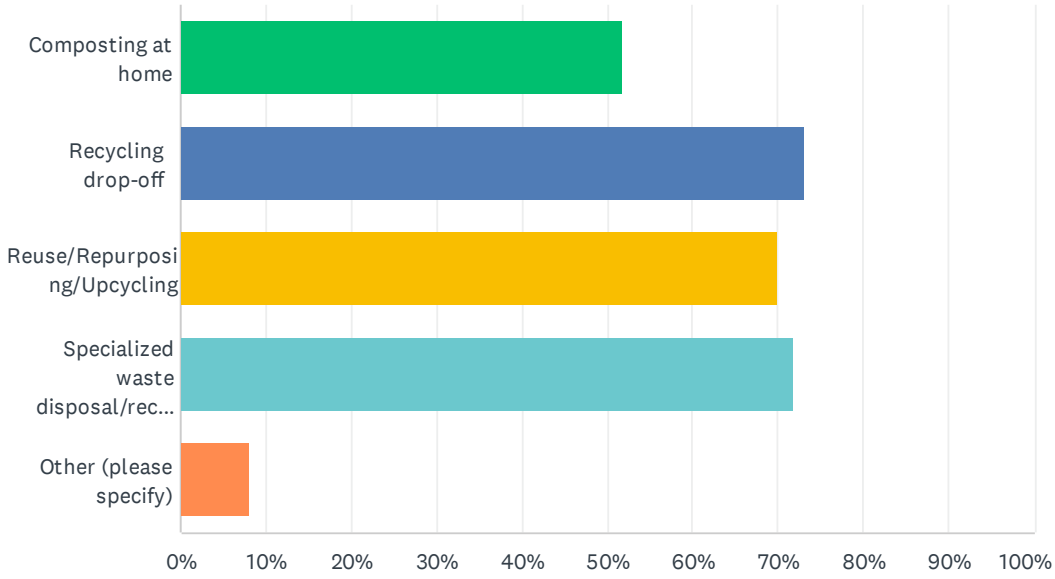
Answered: 168 Skipped: 0



ANSWER CHOICES	RESPONSES	
Drop-off	23.81%	40
Trash pickup service (Including shared dumpsters)	69.64%	117
Burn	3.57%	6
Other (please specify)	2.98%	5
TOTAL		168

Q12 Do you currently use any of the following waste reduction practices? (Select all that apply)

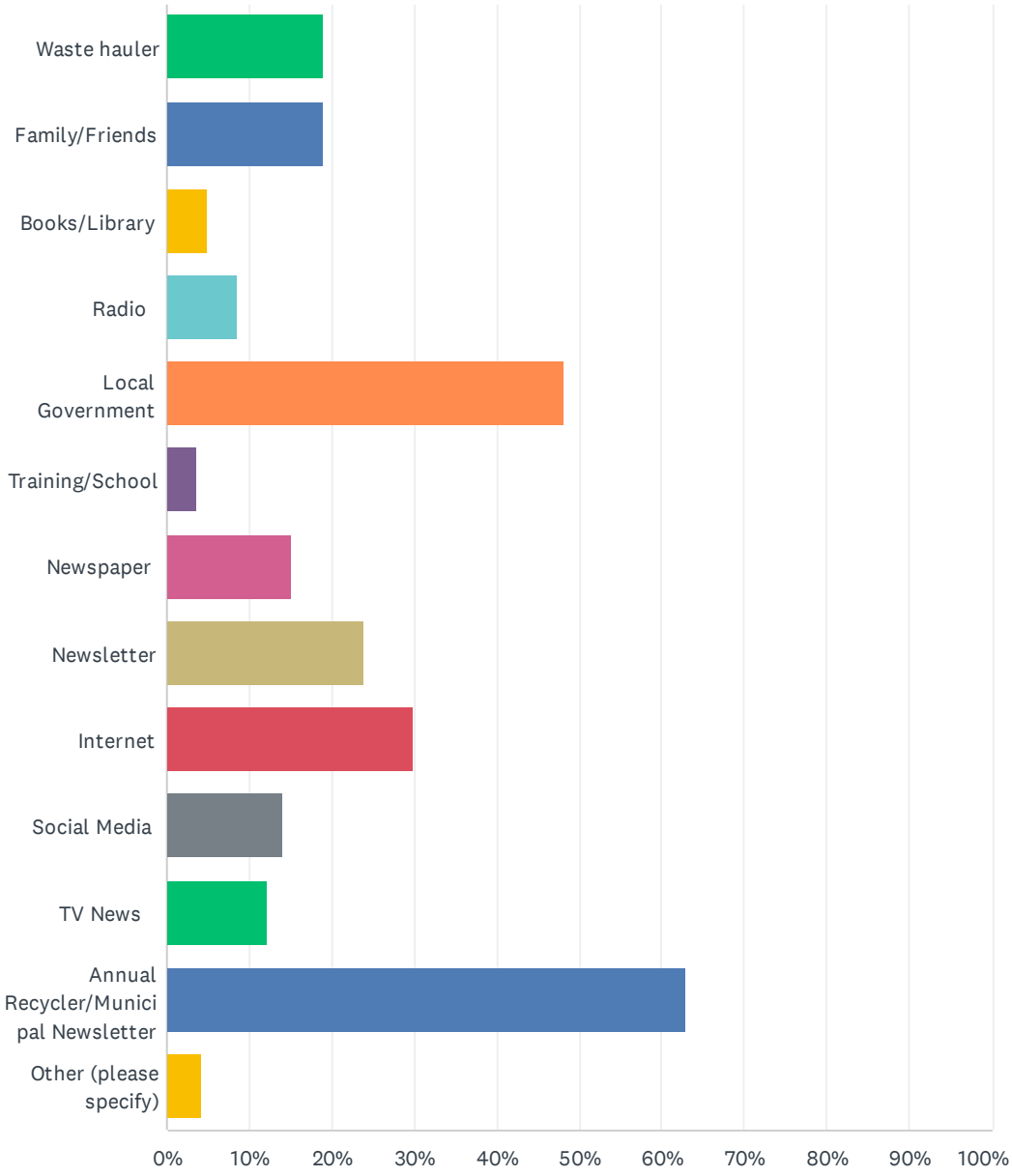
Answered: 160 Skipped: 8



ANSWER CHOICES	RESPONSES	
Composting at home	51.88%	83
Recycling drop-off	73.13%	117
Reuse/Repurposing/Upcycling	70.00%	112
Specialized waste disposal/recycling (Hazardous waste, electronic waste, agricultural waste, etc.)	71.88%	115
Other (please specify)	8.13%	13
Total Respondents: 160		

Q13 Where do you receive information about recycling and waste reduction options in La Crosse County? (Select all that apply)

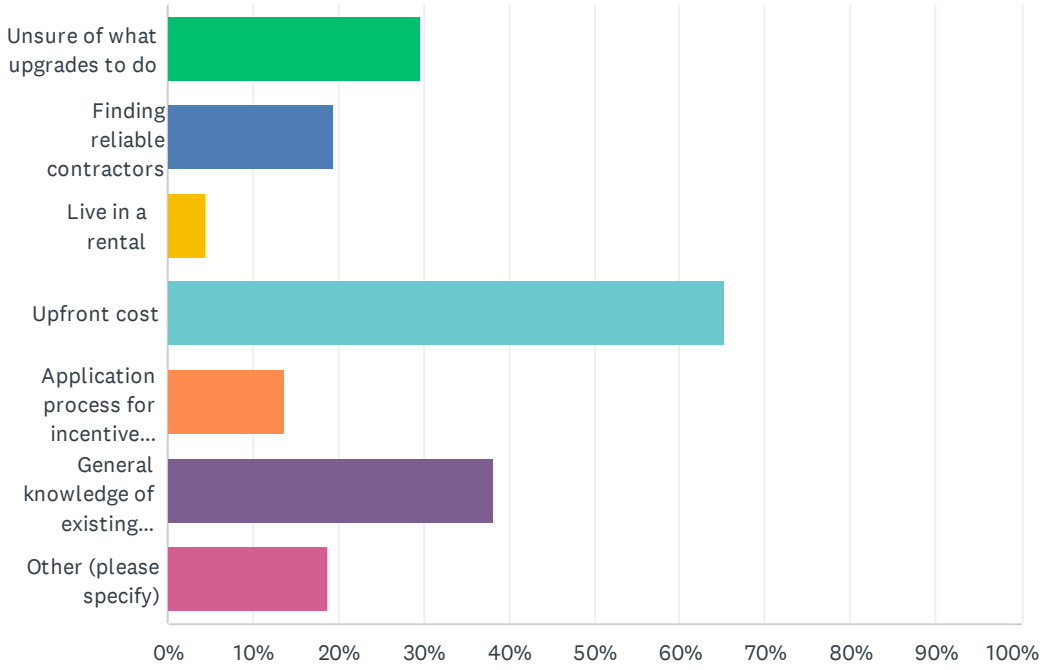
Answered: 164 Skipped: 4



ANSWER CHOICES	RESPONSES	
Waste hauler	18.90%	31
Family/Friends	18.90%	31
Books/Library	4.88%	8
Radio	8.54%	14
Local Government	48.17%	79
Training/School	3.66%	6
Newspaper	15.24%	25
Newsletter	23.78%	39
Internet	29.88%	49
Social Media	14.02%	23
TV News	12.20%	20
Annual Recycler/Municipal Newsletter	62.80%	103
Other (please specify)	4.27%	7
Total Respondents: 164		

Q14 What are barriers to making energy efficiency upgrades to your home or business? (Select all that apply)

Answered: 155 Skipped: 13



ANSWER CHOICES	RESPONSES	
Unsure of what upgrades to do	29.68%	46
Finding reliable contractors	19.35%	30
Live in a rental	4.52%	7
Upfront cost	65.16%	101
Application process for incentive programs	13.55%	21
General knowledge of existing programs and resources	38.06%	59
Other (please specify)	18.71%	29
Total Respondents: 155		

Q15 (Optional) What does a sustainable and resilient La Crosse County community look like, to you, in the year 2050?

Answered: 73 Skipped: 95

Q16 (Optional) What would you like to see done to help residents and businesses prepare for the impacts of climate change?

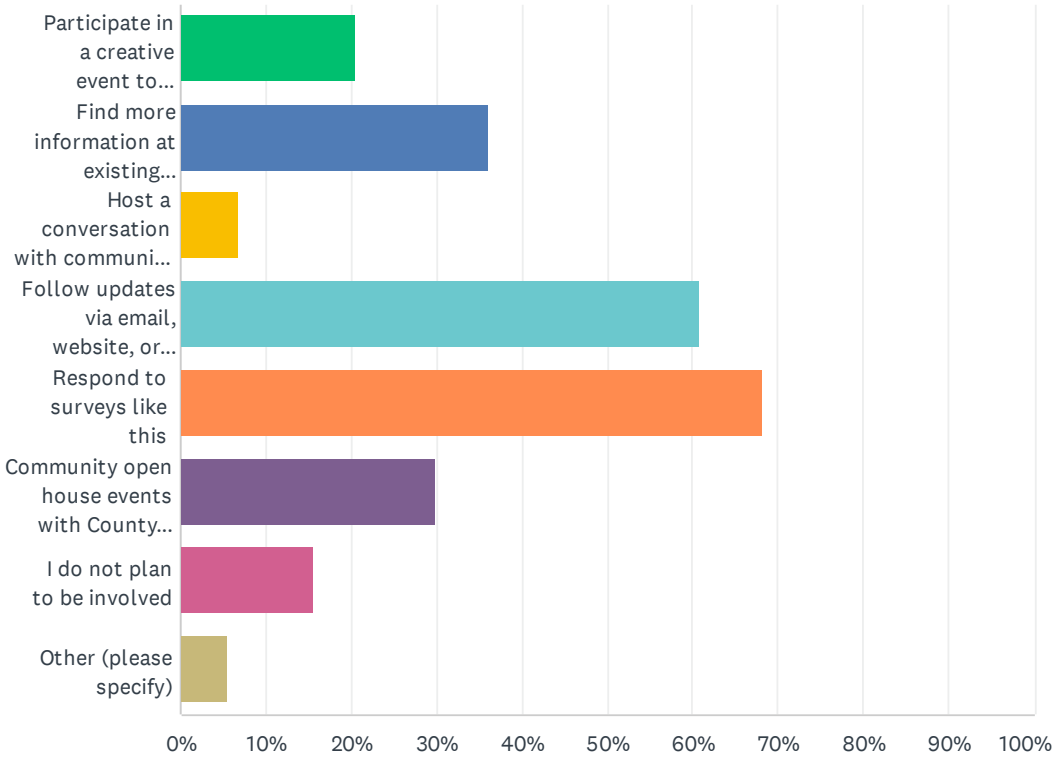
Answered: 68 Skipped: 100

Q17 (Optional) Additional comments that should be considered in the development of the Community Sustainability Plan.

Answered: 38 Skipped: 130

Q18 How do plan to be involved in creating the La Crosse Community Sustainability Plan going forward? (Select all that apply)

Answered: 161 Skipped: 7



ANSWER CHOICES	RESPONSES	
Participate in a creative event to identify solutions with community members	20.50%	33
Find more information at existing community events	36.02%	58
Host a conversation with community organizations I am connected to.	6.83%	11
Follow updates via email, website, or social media.	60.87%	98
Respond to surveys like this	68.32%	110
Community open house events with County staff and information at local libraries and town halls	29.81%	48
I do not plan to be involved	15.53%	25
Other (please specify)	5.59%	9
Total Respondents: 161		

Q19 (Optional) If you'd like to be contacted by La Crosse County about opportunities to be involved in the future, please provide an email address or phone number.

Answered: 25 Skipped: 143

(Optional) Q15. What does a sustainable and resilient La Crosse County community look like, to you, in the year 2050?	(Optional) Q16. What would you like to see done to help residents and businesses prepare for the impacts of climate change?	(Optional) Q17. Additional comments that should be considered in the development of the Community Sustainability Plan.
Open-Ended Response (73 Completed: 95 Skipped)	Open-Ended Response (68 Completed: 100 Skipped)	Open-Ended Response (38 Completed: 130 Skipped)
very weak county government and strong municipal government	foresight with infrastructure planning	communities lead their own plans and county should support them, not push them.
One with balance. We need all sources of power generation. Technology has improved efficiency of solar, wind, gas, hydro and coal. Society is put in pigeon hole of serious power shortages and outages if solar and wind are planned to be the major suppliers. Stop mandates for electric cars. They have their place and citizens should be able to make their own choice. More electric cars in La Crosse is a good goal, but let people choose.	Encourage home owners to continue to be energy smart. Allow energy companies to upgrade and add power generation options that will be reliable and offer as low and consistent rates as possible. Don't be apocalyptic. It's weather and there will always be challenges. Fear only creates additional problems.	
Much more mass transit and biking options, especially outside of the city of La Crosse. Much more education to the general public - everything from the latest of what can be put into the recylcing bins for pickup, along with educating about the importance of recycling appropriately, to small things anyone can do to not only help the environment but also how making changes will save them money. Let's face it, everything comes down to money so it is important to demonstrate that while implementing some things will cost money, people will save money in different ways. I also think it is important to stress how changes we make today will benefit our children tomorrow. I don't know of anyone who doesn't try to give their children the best and what could be better than to give them a healthier environment to live in?	Educate, educate, educate - from multiple angles showing the most direct as well as the indirect benefits that apply specifically to them.	We must get businesses involved in changes, not just individuals. I know they are "only" concerned about their bottom lines, but they can make many changes and then they need to market how they are concerned about/involved with benefitting the community which I believe will catch consumers' attention and possibly increase their business. Bold steps must be taken as quickly as possible. We can't just think about changes, we must start implementing now as well as plan for longer term solutions.
	We need more Recycling. I try to recycle but my garbage is full. We should have more recycable than anything else	
Small gains - Lots of spending	Nothing - not your job	
renewable portfolial for energy production. utilities support self generation	Tax incentives for investing on projects and programs for individuals	
Safe bike ways , not in the middle of the street, next to cars, safe parkways, lighted	Be prepared , work to help before a more expensive fix is needed.	Connect the the city as a whole!
	Print and digital resources available to the public through local government or like-minded retail/event spaces	I've seen other communities/organizations hold "fix-it" events where local community members volunteer their time to help repair household items to keep things out of the landfill. I would love to see something like this in La Crosse County.
Better government incentives for solar home powering. Lower costs for electric vehicles…	Reduced registration for electric vehicles… eliminating taxes on E bikes and registration of E vehicles…	

More recycling support. More renewable energy options and use by municipality.		
I won't be alive in 2050 so this doesn't apply to me.		
	Education in multiple methods	
Improved watershed.	Stop trying to scare people with “climate change”. Climates change all the time it’s not the end of the world	
people who are more self sufficient for their own needs (like having chickens, small gardens, etc)		please please consider those who live out of town. It's not feasible for me to drive to town every day, and we try to limit trips for gas savings, etc.
100% renewal energy. A robust public transit system that services rural as well as urban areas. Public infrastructure that deprioritizes cars and prioritizes public transit, bikes and pedestrians. County and municipal vehicles all ev. A rural community with lots of small, diversified, sustainable farms. A thriving local food system with popular, well funded farmers markets. Prioritizing local food in our schools, nursing homes, daycares, etc. A moratorium on CAFOs. Incentives for conservation and organic, sustainable agriculture. Safe drinking water. A county connected to the rest of the state and to other states via train and regionally transit.	Incentives for farmers to adopt conservation practices like agroforestry, cover crops, contour farming etc. Cost share for energy efficient upgrades and renewable energy. Develop a local food system that prioritizes small diversified farmers over large mono crop operations. This will help our community be more resilient to the increasing unpredictability of the global food supply chain, and keeps money flowing in our community.	There is a whole new generation of sustainability focused farmers who are looking to start their own enterprises, but are unable to because of a shortage of land. These young farmers aren’t looking for a 250 acre row crop farm, nor could they ever front the $2 million+ price tag on something like that. They are looking for 5, 10, maybe 20 acres with a house for a vegetable CSA farm, or a micro dairy, or a specialty sheep fiber farm, or a seed supply business, or an apple orchard or a cut flower farm. It feels like La Crosse County’s current plan doesn’t take these type of farmers into account. It feels like the county is prioritizing large scale corn farmers. But if we’re going to prioritize sustainability, we need to come to terms with the fact that 40% of the corn grown in the U.S. is used for ethanol, which is a carbon negative process that does more harm than good. To really be sustainable, the county needs to focus on incentivizing small, diversified farms, and providing support for beginning farmers looking to build a local food system. I raise these concerns because even though I’ve only been here for a short while, I’m already seeing the consolidation of farmland all around me. Fewer and fewer people are farming the same amount of land. The farms are getting bigger and bigger, and with that scale usually comes sacrifices to sustainability.
Farmers are not regulated into selling their property	Understand that the climate changes on its own and it isn’t completely caused by humans	
Lacrosse county would remain an agricultural county.	More options for farmers to choose from to increase their ability to practice good conservation.	Farmers need to be able to afford any ideas that the county officials decide that they need to invest in for the "greater good"
It is still here	More soil conservation efforts	Realize that world population has plateaued

More renewable energy used, more river clean up and conservation efforts, improved recycling programs	Tax breaks for climate friendly improvements, more charging stations	
More green space. Reduction of light pollution at night. Better recycling practices. Solar energy farms to power small neighborhoods or communities. Banning pesticides. Help with turning lawns into natural area, particularly around county and community buildings.		
		Continue operation of the French Island waste burning facility. We are converting wastes into energy that is beneficial and more importantly extending the life of current landfill and ultimately delaying the need for a new site
Clean air, water, food availability, resources available for all people	Incentivize positive behaviors for reducing climate change	Adjust alternative side parking etc. to align with current weather patterns
Readily available ev charging stations		
Redundant electrical grid. Maximal recycling.	Help townships with solar, water, and recycling in a systematic and uniform way.	
wind energy, more solar, maybe smaller "coops" of energy more charging stations.	more education is always good. the older people I talk to don't want to try anything new. Why am I first seeing this the night of the meeting.	let's have a composting area at the dumps. I use a gym in WS that does not recycle. What other businesses do not. What other How are the recycling programs at the county schools? Sparta schools has an excellent program. If the kids start at school it will become second nature and they can educate the parents.
Must do regenerative farming. It will save the planet and people.	See 15 comment	
Leave rural areas rural		Kickback for green energy users
	Live sensibly without government, especially political, forced influence.	
Reduced government control		
Less government. Less zoning laws. Lower taxes. Elimination of rentals.	I want to see these programs end. I would rather see a county Bible study.	Who elected you?
Hitlers Germany	Stay out of the residents business	
		You assume that we believe the climate change can be controlled by humans. News flash, God is in charge of climate change and there has been no really climate change any different then the last 100 years, compare temperatures from 50 years ago. Problem is everyone thinks they are god. Air quality from other things, that is something that can be discussed. Rural people do not contribute air quality as much as city dwellers.

Rural and urban cohesiveness, limit sprawl, encourage conservation practices	Work together	Should be a positive for all residents
	loans and grants	
Educate, educate, and educate and recognize the things people are doing right. THAT is how you get others to listen. Scaring small school children of Apocalyptic climate changes is inappropriate and abusive to those little imaginative minds. It is distasteful to most people. These things have turned off people and that is why many won't listen anymore, hyper political environment is what has happened, that "climate" needs to change first. Many are weary of the NGO's that push a radical agenda and they are suspicious of the NGO's and Political desired outcome. which sometimes is not financially or scientifically measured to the point where it gives people confidence. Only few people have the talent and educate to unite people, which is how things can really change for better. Everyone is tired of hearing the silly clashing symbols of voices that squash dissenters. The high majority of all people enjoy the beauty of our landscape and environment and want to preserve that. Start with uniting through that common reality and assumption most citizens want a healthy and clean environment. We also want an Environment one that respects Diversity of opinion, which La Crose county claims to respect (Diversity) Implementing the theory that the world is going to be destroyed and we will all die is juvenile and foolish. There is not Scientific data to back that of course, only unreliable outdated weather prediction modeling.	A questionnaire that does not assume the words Climate Change when a group is gathering information. Many have distaste for continuing changing assumptive terms such as Global Cooling, Global warming, Climate change, etc. Citizens have improved over decades in regard to being mindful of the environment. A couple generations back, people would actually do car oil changes and pour the old oil down the public sewer drain. Of course, that was wrong then, and it is now. Education and reasonable laws have improved things like that. Generation of humans cannot ultimately control a climate by the small things they do. The world climate is bigger than us. NASA cannot even explain what is behind the perfection of movement in our sensitive Solar systems, which encapsulate our Climate. We are not God but we are always learning. With reliable weather record keeping only going back a couple hundred years or so, we are still at the infant stages of fully understanding climate. Weather reporters still get the forecast wrong for the upcoming week. Predicting the climate out decades is of course not completely certain, history and the current Weather models used prove this.	
Utilities generate significant majority of power using renewable or low CO2 producing methods. Transportation shifted to less reliance on fossil fuel. Significant reduction in plastic waste.		
Far better recycling and garbage services, more renewable energy sources, reduced use of pesticides at homes and farms		
	Education	
Plans/mitigation for extreme weather..room for water where floods have already occurred..roadside drainage to keep roads intact. Shelter for low income to provide cool or warmth in extreme weather AND energy alternative support for all	Submit phase 1 and 2 plan for vote immediately..that doesn't take years of evaluation	Effects of weather change are inevitable and have to b planned for as much as how to reduce energy consumption..both have to b addressed assp
Doing projects that make environmental sense AND business sense at the same time. Not either at the expense of the other.	Nothing. Climate change has been happening for millions of years.	Again it is great to see focus in this area. Need to do it smartly for both the environment and for financial reasons.

More green space, clean water for fish'n, play, drinking, places to play outside	Recycle, discount upgrades, carbon credits	
clean energy	shared information that's easily accessible	How to find funding sources to keep costs down for residents and businesses
Lower cost of electricity. More concerned with the list of cancer causing, hormone disrupting chemicals used by farmers and land owners	Understand the climate has always been changing, open minds to the possibility the earth is going in a direction it wants to, we don't have adequate historical data about what climate was 1,000 yrs ago. Historical writings suggests many droughts, floods etc	
Not sure	Stop pushing the pseudo science that is the fallacy of man-made climate change	This survey is a prime example of a waste of government resources. How about investing money in county road repairs and maintenance instead?
	Rain gardens with parking lots	
Solar/wind farms. Funding made available to homeowners to offer alternate energy options. Education on the use of chemicals and pesticides on lawns. Laws to stop the use of garden/lawn chemicals and pesticides. Transparency in the recycling of plastics. Is this actually accomplished? More options to the use of plastics.		
Live and let live. Respect others.care for those in need. No drug problem cuz our judges enforce punishments as they should. Gangs are all in jail where they belong. Politicians have brains and don't lie. People have faith in a God who's got our world completely in his care.	Climate change is not gonna have any real impact on our community. Start worrying about important stuff, like how to handle our homeless issue efficiently, and how to get rampant inflation under control!	Give it up and focus on real issues!!
Less use of cars. More mass transit.	Explain 2030 and 2050 parameters for what will change by then if we don't do anything. And make suggestions for what we CAN do.	Keep up the good work!
More efficient HVAC systems for county building and facilities. Better insulated as well.	Insulation.	
A lot more solar collectors, EV fueling stations, wind mills on the bluffs, mandatory recycling and re-use programs.	It is in our, everyone's, interest to mitigate the causes and effects of climate change. When everyone is involved, the government must be involved, in a positive way.	
We need better roads. More people need an avenue for home ownership and land ownership.	Nothing needs to be done to prepare. Climate will always change and it is not killing us. This is just another corporate grab for power over the middle class. Fix our roads.	
Getting liberals out of power	Teach what old farmers know and they will do just fine	Stop pushing theories and taking away peoples freedoms
Affordable options for renewable energy, regardless of household income. More rebates, tax credits, etc.	Nothing. We need to take care of our earth by planting trees, recycling, etc., but ultimately the climate will change over time. Millions of years of history prove it. To think that we can control it is foolishness.	The worst thing we can do is make La Crosse County a bad place to conduct business. This needs to start with education at the residential level. I am shocked that people still toss litter out their car window and don't recycle their household items. When we raise responsible children who respect our environment, they will grow to be business leaders who do the same.

Carbon-free, infrastructure in place to withstand severe weather. Informed citizens doing their part to protect environment. Innovative technology/programs to reverse damage to environment.	Ongoing eduction. United efforts to halt environmental degradation. Incentives to do the right thing.	
La Crosse County businesses and local government make decisions based on what is best for the health of the environment, wildlife, and also humans.	More information shared with the community - via radio and other avenues. Programs that make it easy for residents and businesses to help make a difference. People want to help, but don't know how to.	
		Further comment regarding #10 - The increased cost in utilities to heat/cool my home has required shifting of funds in order to adequately meet that need. So it hasn't prevented me from heating/cooling my home for myself and my family, rather difficult decisions have to be made about other expenses so that my bill is paid monthly. Have the cost of utilities drastically increased, yes, along with many other necessities of life.
Become energy independent, let us access our abundant natural resources that God gave us. Oil and gas....no more stupid windmills and huge solar farms	Stay out of our private homes and businesses. Too much government interference. Ditch smart cities concept. Leave people alone.	Fix the damn roads. Big bike lanes are ridiculous and a waste of our tax dollars. 6 months out of the year people don't ride bikes.
More solar panels. Less use of plastic (stop giving it out in stores). Affordable ways to use stores like Larsons to refill products for the home.	Plant more trees.	
One where our current county leaders start, listening to constituents and stop spending money on pet programs.	I'd like to see county leaders stay in their lane and let citizens use their own resources to support climate initiatives.	Stop using county resources to create plans and aren't necessary.
Would like to see solar more affordable for low income households		
How about not wasting our tax payer money on unnecessary surveys and other unwanted programs	Just let us live. We are intelligent adults and can make choices that will benefit our community and the future lives of our children and grand children.	Stop wasteful spending.
Continue to support our rural communities, not just city living.	Quit over hyping climate change. Do we need to be cautious about it, yes. do we need to live in fear about it, NO.	
Zero carbon emissions	Technological developments to raise efficiency and reduce up front cost of green energy sources (recognizing this is a long tern fix).	
We are one of the highest in rent like to see lower so people can afford things	Cheap bills lower rent	
More trees, more gardens, more people using bicycles, more electric vehicles, more solar arrays, healthier food takeout options	Incentives to install solar and geo-thermal, encouragement to plant trees, incentives to reduce parking lots/asphalt	Healthy lifestyle encouragement: for walking and biking, for avoiding processed foods and soft drinks

HVAC needs met with electrical energy generated by wind, solar, hydro and other renewable sources. Cars and TRUCKS running on 90% or more renewable energy (elec, hydrogen, other). Diminished use of plastics and effective recycling of what remains. Minimal use of salt on roads. Plant more trees.		
Leading by example. Investments in government owned assets (buildings, equipment, vehicles)	Financial incentives for renewable practices (solar, wind, etc)	Proactive community education, we cannot rely on those in denial to participate voluntarily.
We are fine with our current approach	I consider this over blown the earth is in constant change, we can't get to zero....when China and other countries have no controls.....zero is impractical and unattainable	Use what is available but unrealistic numbers like zero should not be used.
Carbon neutral with decreased reliance on fossil fuels	Encourage electrification of homes, businesses, and transportation	
Expertise and factual info that is valued!!! Valuing and preserving natural resources; creative ideas for solving issues—people open to change; celebrating successes at reducing carbon footprint; educating teachers on ideas that translate to classrooms; valuing quality of life over quantity (money and consumption habits),	Be sure community decision makers are well informed and encouraged to keep educating the public. Opportunities to see/hear about actions available. Create ongoing awareness of problems and solutions in variety of ways.	
	Increased incentives for alternative tradition	
People, homes, cars are free of fossil fuels; greater use of public transit and renewables; less dependent on foreign oil	Additional stormwater infrastructure dollars; revolving solar loan program; subsidies/incentives for installing solar and wind; greater education about existing subsidies; streamlined application process for solar and wind permits;	
Don't really know. I don't plan on living that long.	Stabilize the economy and inflation.	Younger people will have to take a larger role. It is their future.
Safe water better come far before 2050. I can’t lug these 5 gallon jugs around much longer	Bring safe water to our community.	We need safe water brought to our community
Like today only less litter	Nothing	
More public transportation and walkability. More green spaces in the more "urban areas" even if very small. More charging stations and renewable energy.	Access to resources such as energy efficiency programs that can be found easily online. Composting bins that can be picked up with trash services. Additional trash services in the unincorporated areas.	
Protections and proactive action taken so others can enjoy a clean and productive environment.		
More solar	Education about grants and programs to help.	

	I'd like to see more education on what changes can be made at an individual level to help prepare. Including cost-effective opportunities. It's hard because change comes with a monetary cost that most (including myself) don't have the means to afford.	I think plans often look at the big picture (which is great), but I'd love to see smaller opportunities for change included- that are easily obtainable for all individuals.
	Education from a trustworthy and reliable source. So many don't believe the issue is fact.	
A sustainable, connected community with affordable housing, great public transit and safe biking routes, a thriving downtown, more trees and a focus on protecting our natural resources.	Increase investment in renewable energies and in weatherizing homes, steer development towards La Crosse and denser neighborhoods.	
		Affordability
	Nothing. Do not spend money on this. There are many more important issues to focus on.	Anything you do or spend money on will do almost nothing to affect climate change. Spend money wisely and not on this!
Lots of public transportation. Busses and trains that service the entire county. An energy portfolio made of solar, wind and hydro. Absolutely no nuclear power—which is way more expensive per watt, has a larger carbon footprint in the creation of nuclear facilities, and has far too many safety and environmental liabilities. 2050 La Crosse County has a vibrant local food economy that supports small family farms, but deprioritizes large industrial farms that only grow corn and soybeans. 2050 La Crosse County will prioritize higher density housing over inefficient suburban sprawl, thereby preserving natural resources and creating more walkable communities.	Subsidies for wind, solar and electrification.	Agriculture must be addressed as part of the climate action plan. La Crosse County needs to prioritize sustainable agriculture.
More electric vehicles powered by renewable energy sources. Multiple recycling opportunities. More energy efficient buildings.		Somehow we need to break into the miss information silos that so many adore.
Higher use of renewable energy. Better husbandry of our environment including planting trees and cover crops, clean water practices to keep pollutants out of waterways.		
Programs to encourage native plants and better water management (for flooding and smart use of rain water)	Community grants to help finance green energy initiatives	
Availability of solar energy for interested property owners. Availability of EV charging stations in public locations. Continued ability of remote working and schooling opportunities to reduce commutes. Accessible and affordable public transportation options includin incentives to promote use of public transportation.		Adequate housing for all no matter the social economic status. Housing availability is a huge issue in our County. Food access and insecurity also need to be addressed.

Appendix F:

Abbreviations & Glossary

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ABBREVIATIONS:

CAP: Climate Action Plan

CH4: Methane

CO2: Carbon Dioxide

CO2e: Carbon Dioxide Equivalent

DOE: U.S. Department of Energy

EPA: U.S. Environmental Protection Agency

EV: Electric Vehicle

GDP: Gross Domestic Product

GHG: Greenhouse Gas

GWP: Global Warming Potential

ICE: Internal Combustion Engine

kWh: Kilowatt Hour

MWH: Megawatt Hour

PHEV: Plug-in Hybrid Electric Vehicle

TOD: Transit-Oriented Development

VMT: Vehicle Miles Traveled

WDNR: Wisconsin Department of Natural Resources

WisDOT: Wisconsin Department of Transportation

The source for all selected Glossary terms listed below is the City of La Crosse Climate Action Plan. Source:

> Pale Blue Dot LLC. (2022, December). *City of La Crosse Climate Action Plan*. City of La Crosse Planning, Development, & Assessment Department. cityoflacrosse.org/home/showpublisheddocument/6927/638155133740270000

DEFINITIONS:

A

Action - Detailed items that should be completed to carry out the vision and strategies identified in the plan.

Adaptation - See "Climate Adaptation or Resilience".

Air Pollutant - Any man-made and/or natural substance occurring in the atmosphere that may result in adverse effects to humans, animals, vegetation, and/or materials. (CARB).

Atmosphere - The gaseous envelope surrounding the Earth. The dry atmosphere consists almost entirely of nitrogen (78.1% volume mixing ratio) and oxygen (20.9% volume mixing ratio), together with a number of trace gases, such as argon (0.93% volume mixing ratio), helium and radiatively active greenhouse gases such as carbon dioxide (0.035% volume mixing ratio) and ozone. In addition, the atmosphere contains the greenhouse gas water vapor, whose amounts are highly variable but typically around 1% volume mixing ratio. The atmosphere also contains clouds and aerosols.

C

Carbon Dioxide (CO2) - A naturally occurring gas, and also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1.

Carbon Dioxide Equivalent (CO2e) - A metric used to compare emissions of various greenhouse gases. It is the mass of carbon dioxide that would produce the same estimated radiative forcing as a given mass of another greenhouse gas. Carbon dioxide equivalents are computed by multiplying the mass of the gas emitted by its global warming potential.

Carbon Emissions - The release of carbon dioxide into the atmosphere. Primary human sources of the release of carbon dioxide occur from burning oil, coal, and gas for energy use.

Carbon Neutrality - This means annual zero net anthropogenic (human caused or influenced) CO2 emissions by a certain date. By definition, carbon neutrality means every ton of anthropogenic CO2 emitted is compensated with an equivalent amount of CO2 removed (e.g. via carbon sequestration).

Carbon Sink - A forest, ocean, or other natural environment viewed in terms of its ability to absorb carbon dioxide from the atmosphere

Carbon Sequestration - This refers to the capture of CO2 from the atmosphere and its long term storage in oceans (oceanic carbon sequestration), in biomass and soils (terrestrial carbon sequestration) or in underground reservoirs (geologic carbon sequestration).

Circular Economy - An alternative to a traditional linear economy (make, use, dispose) in which an economy is a regenerative system where resource input and waste are minimized. This is achieved through long-lasting product design, repair, reuse, remanufacturing, and recycling. Circular economy strategies are often cited as systems level approaches to reducing waste generation through product and system design.

Climate - Climate in a narrow sense is usually defined as the "average weather" or more rigorously as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period is 30 years, as defined by the World Meteorological Organization (WMO). These relevant quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

Climate Adaptation or Resilience - The capacity of a natural environment to prevent, withstand, respond to, and recover from a disruption. The process of adjusting to new climate conditions to reduce risks to valued assets. Adaptation is achieved through actions taken to increase resilience to climate change impacts by reducing vulnerability.

Climate Change – This refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

Climate Migration - Movement of people due to the impacts of climate change on their livelihoods or erosion of quality of life, such as shifts in water availability and crop productivity, or to factors such as sea level rise or storm surge.

D

Deforestation - Those practices or processes that result in the change of forested lands to non-forest uses. This is often cited as one of the major causes of theenhanced greenhouse effect for two reasons: 1) the burning or decomposition of the wood releases carbon dioxide; and 2) trees that once removed carbon dioxide from the atmosphere in the process of photosynthesis are no longer present and contributing to carbon storage.

E

Emissions - The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere.

Environmental Justice - The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Equity - The state or quality of being just and fair in the way people are treated. Equity recognizes that each person has different circumstances and allocates the exact resources and opportunities needed to reach an equal outcome. According to the World Health Organization, Equity is "the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically" while the US Center for Disease Control defines Equity as "when everyone has the opportunity to be as healthy as possible." Within the context of climate change, climate equity means both protection from climate change and environmental hazards as well as access to climate resilience and environmental benefits for all, regardless of income, race, and other characteristics.

Estimation - The assessment of the value of an unmeasurable quantity using available data and knowledge within stated computational formulas or mathematical models.

F

Fossil Fuel - Geologic deposits of hydrocarbons from ancient biological origin, such as coal, petroleum and natural gas.

Fuel Combustion - The intentional oxidation of materials within an apparatus that is designed to provide heat or mechanical work to a process, or for use away from the apparatus.

G

GHG - See "*Greenhouse Gas*"

Global Warming - An average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities. Also see "*Climate Change*".

Global Warming Potential (GWP) - An index, based upon radiative properties of wellmixed greenhouse gases, measuring the radiative forcing of a unit mass of a given well-mixed greenhouse gas in the present-day atmosphere integrated over a chosen time horizon, relative to that of carbon dioxide. The GWP represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in absorbing outgoing thermal infrared radiation. The Kyoto Protocol is based on GWPs from pulse emissions over a 100-year time frame.

Greenhouse Gas Effect - Trapping and build-up of heat in the atmosphere (troposphere) near the earth's surface. Some of the heat flowing back toward space from the earth's surface is absorbed by water vapor, carbon dioxide, ozone, and several other gases in the atmosphere and then reradiated back toward the earth's surface. If the atmospheric concentrations of these greenhouse gases rise, the average temperature of the lower atmosphere will gradually increase.

Greenhouse Gas (GHG) - Is any gas that absorbs infrared radiation in the atmosphere. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO2), methane (CH4), and nitrous oxide.

Greenhouse Gas Reduction - Actions taken to reduce the number and severity of potential future climate impacts compared to unchecked greenhouse gas emissions.

Green Infrastructure - An approach to managing precipitation by reducing and treating stormwater at its source while delivering environmental, social, and economic benefits. Stormwater runoff can carry trash, bacteria, and other pollutants and is a major cause of water pollution in urban areas.

Gross Domestic Product (GDP) - The sum of gross value added, at purchasers' prices, by all resident and non-resident producers in the economy, plus any taxes and minus any subsidies not included in the value of the products in a country or a geographic region for a given period, normally one year. It is calculated without deducting for depreciation of fabricated assets or depletion and degradation of natural resources.

Groundwater - Water that occurs beneath the water table in soils and geologic formations that are fully saturated.

H

Hazard - The potential occurrence of a natural or human induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, and environmental resources.

I

Impact - An effect of climate change on the structure or function of a system: for example, environmental consequences of climate change, such as extreme heat waves, rising sea levels, or changes in precipitation resulting in flooding and droughts.

K

Kilowatt Hour (kWh) - A measure of electrical energy equivalent to a power consumption of 1,000 watts for one hour.

L

Land Use and Land Use Change - Refers to the total of arrangements, activities, and inputs undertaken in a certain land cover type (a set of human actions). The term land use is also used in the sense of the social and economic purposes for which land is managed (e.g., grazing, timber extraction and conservation). Land use change refers to a change in the use or management of land by humans, which may lead to a change in land cover. Land cover and land use change may have an impact on the surface albedo, evapotranspiration, sources and sinks of greenhouse gases, or other properties of the climate system and may thus have a radiative forcing and/or other impacts on climate, locally or globally.

M

Megawatt Hour (MWH) - A measure of electrical energy equivalent to a power consumption of 1,000,000 watts for one hour.

Methane (CH4) - A hydrocarbon that is a greenhouse gas with a global warming potential most recently estimated at 25 times that of carbon dioxide (CO2). Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Metric Ton - The tonne (t) or metric ton (MT), sometimes referred to as a metric tonne, is an international unit of mass. A metric ton is equal to a Megagram (Mg), 1000 kilograms, 2204.6 pounds, or 1.1023 short tons.

Mitigation - Actions taken to limit the magnitude or rate of longterm global warming and its related effects. Climate change mitigation generally involves reductions in human emissions of greenhouse gases.

O

Ozone (O3) - Ozone, the triatomic form of oxygen (O3), is a gaseous atmospheric constituent. In the troposphere, it is created both naturally and by photochemical reactions involving gases resulting from human activities (smog). Tropospheric ozone acts as a greenhouse gas. In the stratosphere, it is created by the interaction between solar ultraviolet radiation and molecular oxygen (O2). Stratospheric ozone plays a dominant role in the stratospheric radiative balance. Its concentration is highest in the ozone layer.

R

Renewable Energy - Energy resources that are naturally replenishing such as solar, wind, hydro and geothermal energy.

Resilience - The ability to anticipate, prepare for, respond to, and recover quickly from climate change hazards with minimum damage to social well-being, the economy, and the environment.

S

Source - Any process, activity or mechanism that releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas or aerosol into the atmosphere.

Sink - Any process, activity or mechanism that absorbs a greenhouse gas, an aerosol, or a precursor of a greenhouse gas from the atmosphere or before it reaches the atmosphere.

V

Vehicle Miles Traveled (VMT) - A unit used to measure vehicle travel made by private vehicles, including passenger vehicles, truck, vans and motorcycles. Each mile traveled is counted as one vehicle mile regardless of the number of persons in the vehicle.

W

Weather - Atmospheric condition at any given time or place. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation. In most places, weather can change from hour-to-hour, day-to-day, and season-to-season. Climate in a narrow sense is usually defined as the "average weather", or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period is 30 years, as defined by the World Meteorological Organization (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system. A simple way of remembering the difference is that climate is what you expect (e.g. cold winters) and 'weather' is what you get (e.g. a blizzard).