Eau Claire

Renewable Energy Action Plan

TABLE OF CONTENTS

Adopted February 25, 2020

City of Eau Claire, Wisconsin

ACKNOWLEDGEMENTS

Land Recognition Statement

We acknowledge and honor that the land the city of Eau Claire occupies is the sacred and ancestral lands of the Ojibwe, Dakota, and other Indigenous Peoples.

Thank you to the following organizations and individuals for their contributions:

City Council

Terry Weld, President
Emily Anderson
Kate Beaton
Emily Berge
Jill Christopherson
Catherine Emmanuelle
Jeremy Gragert
David Klinkhammer
John Lor
Andrew Werthmann
At Large Member (vacant)

Plan Commission

Eric Larsen, Chair
Craig Brenholt
Jill Christopherson
Jeremy Gragert
Gregory Granlund
Zina Obaid
Terry Pederson
James Seymour
Susan Wolfgram

Sustainability Advisory Committee

Brian Graff
David Hon
Brian Larson
Crispin Pierce
Sarah Rykal
Jim Schumacher
Steve Terwilliger
Dody Wubker
Tyrel Zich

Renewable Energy Action Plan (REAP) Steering Committee

REAP Steering Committee Members

Rachel Bauer, Miron Construction
Kate Beaton, City Council Member
Lauren Becker, UWEC Student Office of Sustainability
Dave Bell, Next Step Energy
Lori Bica, Eau Claire Area School District
Lydia Boerboom, Eau Claire County Board
Jim Boulter, UWEC Department of Chemistry
Barry Bremness, Cascade Tissue
Aaron Brewster, Wisconsin Climate Table
Mike Buck, Holiday Mega Gas Stations
Anna Cardarella, Western Dairyland
Josh Clements, City of Altoona
Robert Dubiel, Mayo Clinic Health System
Jim Dunning, Eau Claire County Board
Cindy Estrada, Green Building Architecture
Heather Feigum, CESA 10 / Focus on Energy
Ann Francis, Bicycle & Pedestrian Advisory Committee
Brian Graff, Solar Forma*
Greg Granlund, Lien & Peterson Architects / Plan Commissioner
David Hon, Department of Natural Resources*
Julia Johnson, Pablo Properties
Sam Johnson, JAMF
Gina Keenan, Department of Natural Resources
Kerry Kincaid, Former City Council President

Brian Larson, Architecture*
Mark Lauer, IBEW Local Union 14
Karen Mumford, UWEC Watershed Institute
Zina Obaid, Realtor / Plan Commissioner
Zacharious Pappas, Earthbound Environmental Solutions, LLC
Crispin Pierce, UWEC Environmental Public Health*
Sarah Rykal, UW-Stout*
Jim Schumacher, Citizens Climate Lobby*
Mike Schummer, Bartingale Mechanical
Matt Steinbach, Eau Claire City-County Health Department
Lillian Strehlow, UWEC Student Office of Sustainability
Steve Terwilliger, Renewables & Transit*
Aaron Tessendorf, Kia Prestige
Jeff Urlab, MEP Associates
Jim Vaudreuil, Heubsch Laundry
Mark Vinall, Advanced Disposal
Nick Webber, IBEW Local Union 953
Adam Wehling, Chippewa Valley Technical College
Andrew Werthmann, City Council Member
Ellenor Wolf, Sierra Club
Dody Wubker, Eau Claire Energy Cooperative*
Tyrel Zich, Xcel Energy*

*Member of the City's Sustainability Advisory Committee

City of Eau Claire Staff Members

Scott Allen, Community Development Director
Ned Noel, Associate Planner (Project Lead)
Patrick Ritchie, Energy Intern

Xcel Energy Partners in Energy

Xcel Energy supported this process through their facilitated energy planning service, Partners in Energy. Special thanks to the following contributors:

Tami Gunderzik, Partners in Energy Program Manager
Oscar Brandser, Key Account Manager
Lori Drilling, Manager, DSM & Energy Efficiency Programs
Brian Elwood, General Manager, Customer and Community Service
Deb Erwin, Manager, Regulatory Policy
Julie Thoney, Community Service Manager
Jenny Edwards, Partners in Energy Community Facilitator
Jamie Johnson, Partners in Energy Community Facilitator

Plan Graphics and Cityscape Design

Cora Trout, Center for Energy and Environment

Chippewa Valley Technical College

Special thanks to Adam Wehling, Dean of Agriculture, Energy & Transportation and the Chippewa Valley Technical College for hosting the community workshops at the Energy Education Center. Their Leadership in Energy and Environmental Design (LEED) gold building epitomizes the goals of this plan.

Office of Energy Innovation

INTRODUCTION

The City of Eau Claire has committed to transition away from a fossil-fuel-based economy to mitigate and respond to the threat of climate change. Tackling global climate change at the local level is imperative to take responsibility and to address human and environmental risks. It also brings numerous co-benefits to the community including improved health, air and water quality, essential service resiliency, and economic development.

The purpose of this Renewable Energy Action Plan (REAP) is to lay out a pathway to meet the City's twin goals of carbon neutrality and 100% renewable energy by 2050. It charts out a holistic course across five major sectors: commercial buildings and industry, residential buildings, transportation, waste, and biodiversity. Strategies include direct action on programs, policies, and land use decisions; community-led campaigns to change individual behavior; and engagement with partners such as energy utilities to work across jurisdictions and solve shared challenges.

A REAP Steering Committee was created to help develop this plan. The group was compromised of 40 plus community stakeholders representing various points of view, but it will take everyone in the community to accomplish the goals.

This plan covers a 10-year timeframe to meet the City's 2030 interim goal of a 30% greenhouse gas reduction below 2015 levels. Longer-term, more transformational strategies will be needed beyond that time period and will be the focus of future planning work. The strategies outlined in this plan, combined with a decarbonizing electricity grid, set the City on course to meet its 2030 carbon reduction goal.

Figure 1. REAP Steering Committee's Word Cloud Responses to why this plan is important

COMMUNITY BACKGROUND

Eau Claire's Commitment to Carbon Neutrality

The consequences of land use change and burning significant levels of fossil fuels over the past 100 years have caused a serious quality-of-life threat. The warming planet is having profound effects on nature and society. The results are showing in ecosystem change and more extreme weather that affect human life, communities, property, infrastructure and the economy.[1] Risk management concerning climate change is a growing concern for federal and state agencies, local governments, power companies, the insurance and finance industries, socially responsible corporations, agribusiness, and more.

Eau Claire's annual average temperature has warmed from 43.8°F in 1960 to 46.6°F in 2010, a difference of 2.8 degrees. Climate modeling specific to Wisconsin predicts that by 2050 warming could here increase to 50.1°F for a total of 6.3°F over 90 years.[2] Results mean more extreme precipitation events and flooding, shorter winters, drought, and greater vector-borne diseases. These can then trigger negative cascade effects on the local community's social, ecological, and economic well-being.

In June 2017, the Eau Claire City Council directed the City's Sustainability Advisory Committee and staff to analyze what the community and municipal operations needed to do locally to support global and national policy on climate change. The *Towards a Renewable City Executive Summary Report*[3] recommended several goals consistent with The Paris Agreement.[4] The international treaty seeks to mitigate the impacts of climate change by holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. The City Council by resolution adopted the report's community and municipality recommendations on March 13, 2018.[5] They are as follows and form this plan's framework:

- Achieve carbon neutrality by 2050
- Use incremental carbon drawdown targets to reach neutrality
- Use a 2015 greenhouse gas inventory baseline
- Obtain 100% renewable energy by 2050

---

[1] Fourth National Climate Assessment, Volume II: Impacts, Risks, and Adaptation in the United States at https://nca2018.globalchange.gov/

[2] Wisconsin Educational Communications Board and University of Wisconsin-Madison at https://climatewisconsin.org/story/temperature-change

[3] City of Eau Claire Towards a Renewable City Executive Summary Report. Sustainability Advisory Committee, December 2017 at https://www.eauclairewi.gov/home/showdocument?id=23645

[4] The Paris Agreement at https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[5] Eau Claire City Council 2050 Goals Resolution at https://www.eauclairewi.gov/home/showdocument?id=23643

Assuming there is general 1% annual economic and population growth in the city that occurs in this period, the resulting metric ton reduction goals are shown below.
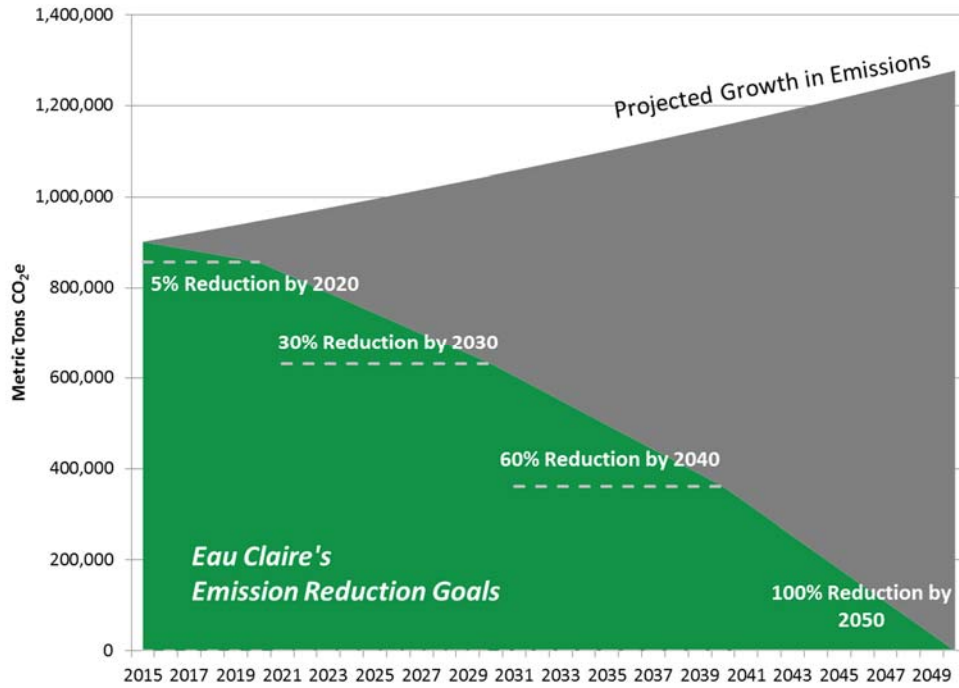
Figure 2: Eau Claire's Carbon Reduction Goals from a 2015 Baseline
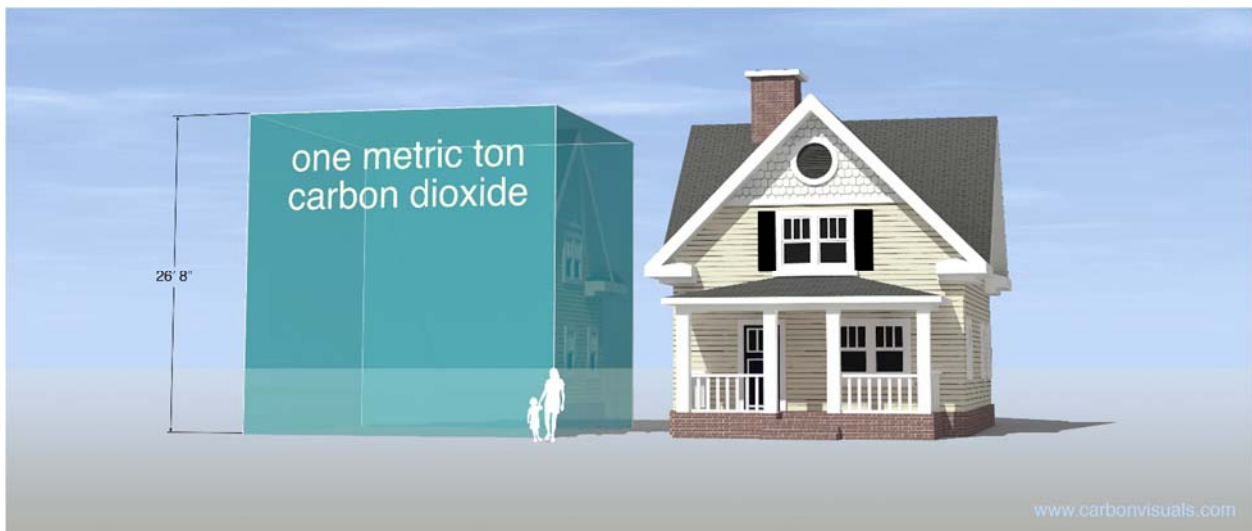
Figure 3: What does a Metric Ton of Carbon Dioxide look like?

Community Strengths and Partners

The Eau Claire community has numerous local assets that will be crucial for implementing the actions of this plan. The city's role as a regional hub brings innovation and cultural resources. Long-standing institutions and employers, combined with a strong local workforce, create local investment benefits. Continued leadership on environmental issues however, will be key to move this plan forward.

The REAP steering committee listed the community's assets and strengths as identified in the picture. It will be critical that the community leverages these for the strategies to be effective in meeting goals. Partnerships will be needed, and it will take the full community, including individual residents and businesses, all doing what they can.

Eau Claire is fortunate that other major community anchors have pledged to carbon and renewable energy goals and this will open the door for greater collaboration and collective action.

- The University Wisconsin–Eau Claire pledged in 2009 carbon neutrality by 2050.
- Xcel Energy, in December of 2018, passed the utility industry's first carbon-free electricity 2050 goal.
- Eau Claire County and Eau Claire Area School District passed resolutions in 2019 to be carbon neutral and 100% renewable energy by 2050.

In October 2019, the City and Xcel Energy further cemented their relationship by entering into an Energy Future Collaboration (EFC). The joint agreement provides a memorandum of understanding on shared values and principles to advance clean energy and economic development. The EFC will provide a work plan in concert with REAP's implementation work plan.
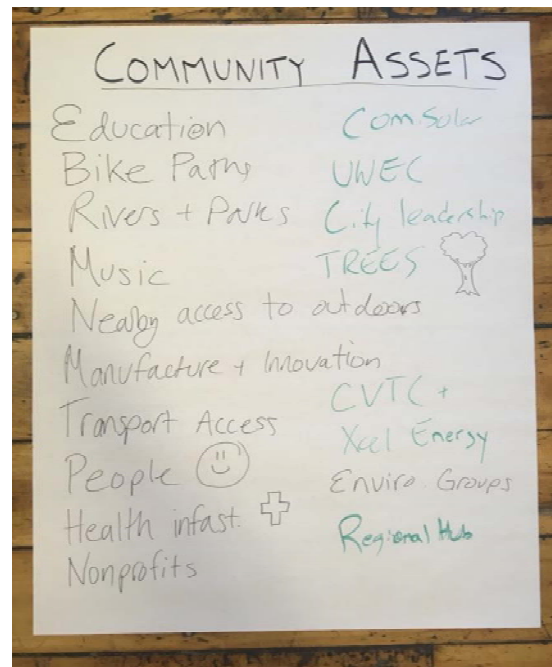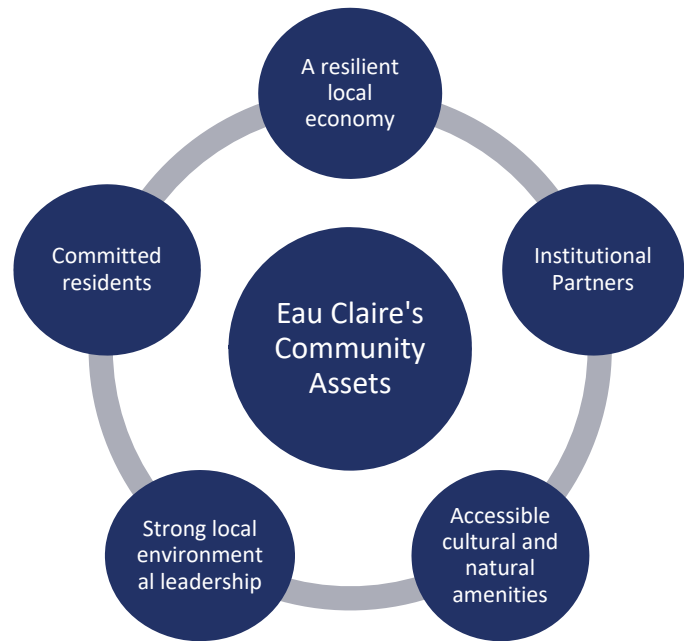
Figure 4. Community Assets identified by REAP Committee

Previous Work

The City of Eau Claire has been working on concerted sustainability efforts for well over a decade. The following is a non-exhaustive list of various activities the City has been undertaking.

- In 2008, the City adopted the State's voluntary 25% by 2025 renewable energy goal.
- An interdepartmental staff green team has been working on projects since 2008.
- The Hobbs Ice Arena remodeled project created in 2008 the City's first LEED-certifiable building.
- In 2009, the City adopted The Natural Step framework to achieve greater sustainability.
- A Sustainability Chapter in the Comprehensive Plan was added in 2009 and updated in 2015.
- The City helped form and served on the local Chamber of Commerce's Green Business Initiative.
- The first carbon footprint for municipal operations was completed for the year 2011.
- The City has been a member of the DNR's Green Tier Legacy Communities program since 2012 and currently serves on its Executive Committee.
- Have procured five diesel hybrid buses since 2013 (pictured below with eco-motif).
- Since being created in 2014, the City's Sustainability Advisory Committee has been implementing yearly plans and projects.
- In 2015 the Waste Water Treatment Plant was upgraded to capture 50% more biogas for combined power and heat operations. Affluent discharge into the Chippewa River was also reduced by 95%.
- Eau Claire County was the first county in the State to enable Property Assessed Clean Energy (PACE) program legislation.
- The first community-wide carbon footprint was developed using a 2015 baseline year.
- The City created an urban wood reuse program in 2017 for businesses to repurpose street trees.
- After Xcel Energy created the largest community solar program in the State, the first 1 megawatt array was energized in 2017 on a City-owned landfill.
- Two community solar group buys have been undertaken since 2017.
- The City earned a top 10 Solsmart Gold designation in 2017 under the U.S. Dept. of Energy.[6]
- In 2018, carbon neutrality and 100% renewable energy goals by 2050 were adopted by the City. A subsequent resolution supported federal legislators to pass a carbon fee and dividend system.
- The City joined the Global Covenant of Mayors for Climate and Energy in 2019 and submitted its first carbon disclosure report internationally.[7]

PLAN DEVELOPMENT

Process

To undertake this effort, the City applied for and received a planning grant from the State Office of Energy Innovation (OEI) at the Public Service Commission. Funding was provided to the OEI through the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) and covers the REAP plan and its sub-plan components. **A Net Zero Energy Building Guide, Solar-Ready Guide and Electric Vehicle Roadmap are the supplements to this plan.** A municipal facility condition assessment (FCA) covering energy audits and physical structure needs was also included in the grant funding. The FCA report will detail replacement costs and will align with the 2050 goals.

As part of this plan's development, the City chose to use Xcel Energy's Partners in Energy professional services. Partners in Energy staff help communities develop locally-tailored energy plans and then assist with implementation activities. Xcel Energy also provided matching dollars for an energy intern to help on the plan creation and model goals.

The plan was developed with more than 40 community stakeholders forming the REAP steering committee. The roster is noted on the Acknowledgments page. The committee provided input, ideas, and direction over the course of five workshops from May to November 2019. Their personal and professional expertise and connections in the community will be invaluable moving forward.

The plan was included in the City's Sustainability Advisory Committee (SAC) 2019 work plan, and thus all its members were on the steering committee. They provided additional direction during their regular meetings.

The City also sought community feedback through a temporary public art installation located at Haymarket Plaza. Ideas for action could be written on the mural using chalk paint pens.

After the workshops concluded, the plan was reviewed by SAC and the Plan Commission for further direction. After finalization, public hearings were held and both bodies approved the plan in mid-February 2020. The City Council then adopted the plan on February 25th. The plan is a part of the City's Comprehensive Plan and has the same authority in decision-making. Its strategies will be implemented in various work plans of the City which will articulate the role of policy-maker, staff, and the community.

Vision & Guiding Principles

The REAP Steering Committee, through survey responses and workshop feedback, developed the following vision and guiding principles to steer the focus of this planning effort. The vision provides a unifying umbrella for the planning process and its ongoing implementation.

Eau Claire's Renewable Energy Action Plan will be guided by an evidence-based, transparent, equitable, and inclusive process to meet the goals of 100% renewable energy and carbon neutrality by 2050.

These ongoing efforts will strengthen our leadership in sustainability and renewable energy development for generations to come.

In the process of developing the principles, the Steering Committee relied on The Natural Step four system conditions that the City adopted in 2009. These are to reduce dependency on fossil fuels, manufacture of toxic chemicals, and encroachment on nature, as well as to meet the justice, safety, health, and social needs of the community.[8] The guiding principles below help prioritize the plan strategies and emphasize other values and goals beyond carbon savings. Social equity and inclusiveness, in particular, must address present barriers and future generations. Those with less or no ability should not be sidelined or cast to circumstances that undermine their basic needs. However, a plan can only go so far — equity and the other principles should be intentionally designed into strategies during implementation.

Equity and Inclusiveness: *Our work will engage and support the entire community, increasing benefits for under-resourced populations.*

Economic Development: *We will develop and implement ideas that maximize community investment and local economic opportunity.*

Ecosystem Stewardship: *We will preserve, protect, and enhance the natural world around us, for our benefit and for generations to come.*

Ecosystem Stewardship

Equity & Inclusiveness
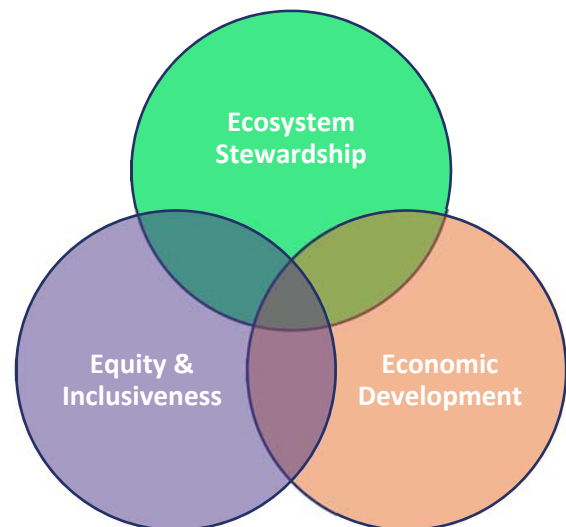
Economic Development

Integration with Other Community Plans

The Renewable Energy Action Plan (REAP) builds on previous energy, environmental, and resilience activity from other City and community-wide plans. As mentioned, the REAP carries the weight and authority as the Comprehensive Plan does for the City. It is a guiding document to meet the 2050 goals. Therefore, it must be integrated and consistent with the aims and plans inside the City's overall master plan. In particular, REAP is connected to, but not limited to the following plans.

- **City of Eau Claire Comprehensive Plan, 2015**[9]
  - Sustainability Chapter
  - Health Chapter
  - Land Use and Growth Management Chapter
  - Natural Resources Chapter
  - Parks, Greenways, and Trails System Chapter
  - Transportation System Chapter
- **The City and County Multi-Hazards Mitigation Plan**[10]
  - Context on climate change
  - Adaptation and mitigation recommendations
  - Emergency actions
  - Risk and vulnerabilities assessment
- **City of Eau Claire's 2019–2020 Strategic Plan**
  - Goals of City Council to meet 100% renewable energy and carbon neutrality by 2050
  - Provide environmentally sustainable infrastructure and services
- **City of Eau Claire (Chippewa Valley Partnership) Energy Independence Plan, 2010**[11]
  - Municipality's plan to meet the City's previous 25% renewable energy goal by 2025

---

[9] City of Eau Claire Comprehensive Plan at https://www.eauclairewi.gov/government/our-divisions/planning/comprehensive-plan
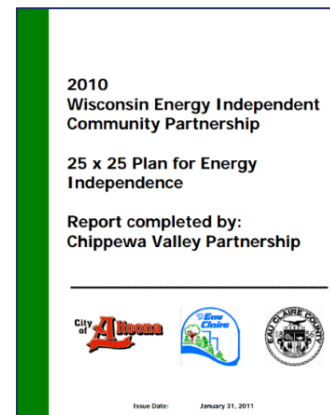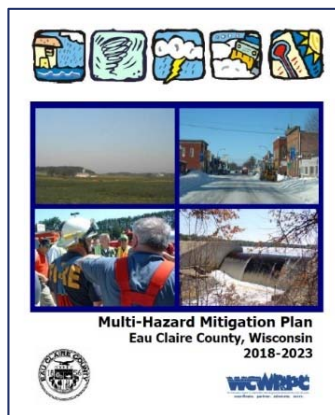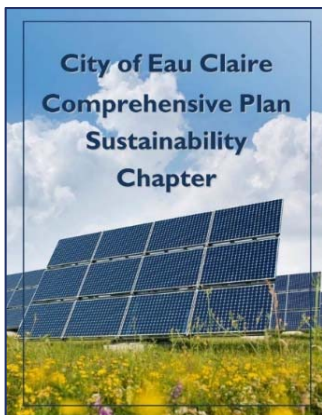
[10] Multi-Hazard Mitigation Plan at http://wcwrpc.org/Documents/ECCo%20Haz%20Mit%20DRAFT%20Full%20JAN%2025%202019.pdf

[11] Chippewa Valley Partnership 25x25 Plan for Energy Independence at https://www.eauclairewi.gov/home/showdocument?id=547

EAU CLAIRE'S GREENHOUSE GAS EMISSIONS TODAY

Eau Claire's greenhouse gas emissions come from three primary sources: electricity and natural gas use in buildings, fossil fuels burned for transportation, and global warming gases, primarily methane, generated through solid waste and wastewater processing[12]. See Appendix F for more detail.

Figure 5 below shows how these sources have changed over the last four years. The carbon inventories account for emissions associated with transportation and mobile sources, residential energy, commercial and industrial (C&I) energy and emissions associated with methane at the landfill.

Community Carbon Inventories (MT CO2e)

2015	2016	2017	2018
901,683 MT CO2e	**853,738 MT CO2e**	**872,695 MT CO2e**	**901,857 MT CO2e**

■ Transportation & Mobile Sources ■ Solid Waste ■ C&I Energy ■ Residential Energy
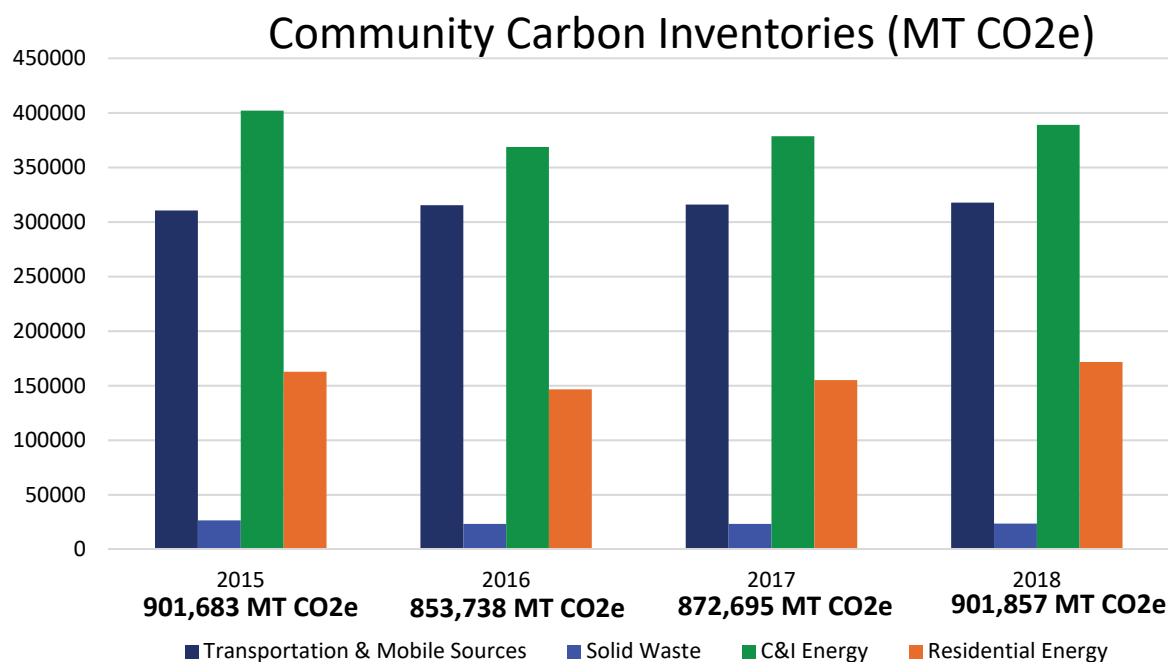
Figure 5. Eau Claire's Community-Wide Greenhouse Gas Emissions 2015–2018

Although there has been significant progress made in grid decarbonization over the four years accounted for in the carbon inventories, there were no reductions in emissions from the baseline year of 2015 compared to 2018. The reality is that annual energy use can fluctuate year-to-year with changes in weather which impacts energy demand for heating and cooling. Also, as the community grows more emissions could offset previous reductions. Thus, it will be important to continue to monitor emissions associated with energy use annually to track reductions through the strategies outlined in this plan.

As shown next, building energy use is the largest single contributor to the community's profile. According to historical data from Xcel Energy, natural gas is 60% of all building energy use, while site electricity accounts for 40%. The largest single source of demand is commercial and industrial natural gas, which is driven by Eau Claire's large industrial customers. Municipal energy use broken out is less

---

[12] Wastewater emissions were excluded because electricity and natural gas consumption at the wastewater treatment plan were included in the commercial energy sector. Emissions associated with combustion of biogas and effluent discharge were insignificant to display graphically.

than 2% of all community-wide energy consumption. More information on building use can be found in Appendix C.

The greenhouse gas emissions associated with electricity use are poised to decrease over the next 30 years, with Xcel Energy, Eau Claire's largest electricity supplier, announcing a company-wide commitment to carbon-free electricity by 2050.
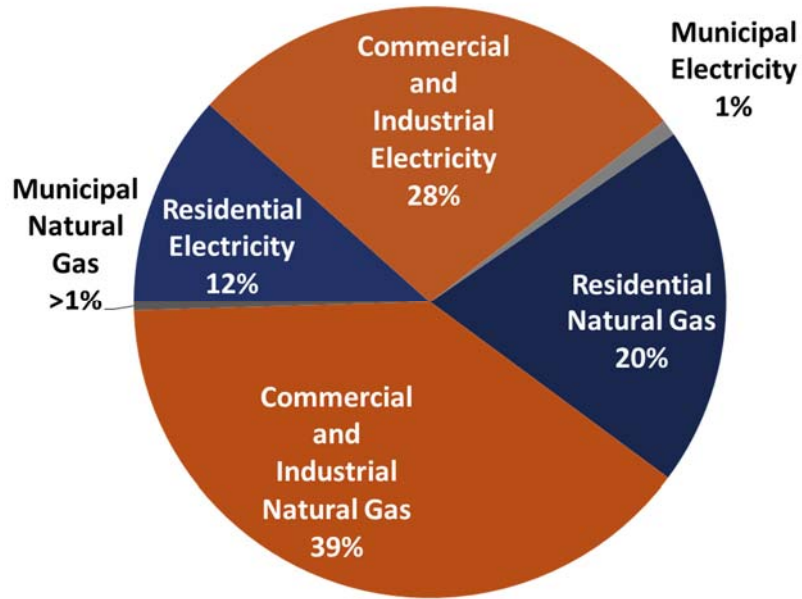
Figure 6. Eau Claire's Electricity & Natural Gas users, 2018

Sectors of Opportunity

The Strategies outlined in this plan are organized by sector, which align with the community-wide emissions inventory. They are:

Biodiversity: Strategies that increase the natural carbon sinks in Eau Claire by enhancing local vegetation and natural landscapes

Residential Building Energy Use: Strategies to reduce carbon from the electricity, natural gas, and delivered fuels (e.g., fuel oil) that are used to run residential buildings

Commercial, Industrial, and Institutional Energy Use: Strategies to reduce carbon from the electricity, natural gas, and delivered fuels that are used to run business and industry within the city

Transportation: Strategies that reduce the amount of vehicle travel or convert fossil fuel vehicles to lower-carbon options

Waste: Strategies that reduce the amount of waste generated and sent to landfills, a source of methane emissions

Cross-Cutting: Strategies that work across multiple sectors to cut emissions and increase renewables

NEAR-TERM STRATEGIES: 2020–2030

Near-term strategies are defined as strategies that are substantially achievable within a 10-year time horizon — the time scope of this plan. This section outlines the set of strategies identified as near-term priorities by the Steering Committee. Appendix A contains more detail on specific tactics. The following tables capture a few example strategies and how they work to advance the plan's identified principles.

Equity & Inclusiveness Principle	
Strategy Highlights	
B5. Retain, restore, and enhance natural spaces	Public parks or gardens rich in biodiversity bring people together and can be therapeutic.
R1. Energy efficient new affordable housing with renewable energy	Increase access to clean energy and lowers operational expense long term.
R6. Home energy score disclosure ordinance	Empowers renters to understand utility bill costs before signing a lease contract.
T9. Explore a zero-fare transit system	Incentivizes increased transit ridership and saves on household transportation costs.

Economic Development Principle	
Strategy Highlights	
R2/C1. Deploy Net Zero Energy Building Guide	Grows demand for skilled trades, clean energy jobs, and improves the value of the city's building stock.
C3. Offer and promote financial resources to reduce costs of clean energy projects	Lowers energy costs to manufacturers and business owners to improve their financial bottom line.
T2. Incentivize and require more compact and mixed-use development	Promotes sensible density, efficient use of land and services, and increases land value.
CC6. Local institutions train the next generation of the environmental workforce	Continue to grow programs to educate a skilled workforce in clean energy and sustainability jobs.

Ecosystem Stewardship Principle	
Strategy Highlights	
B2. Create a Biodiversity Index	The index will catalog and value ecosystem services to protect for growth, resiliency, and adaptation.
B12. Support local food, local producers, and urban farmers	Local food production increases appreciation for the earth and eating nutritious food.
W4. Transition haulers to capture more compostables	Diverting organics can reduce landfill expansion need and methane emissions.
CC2. Continue to support a social cost of carbon in climate and energy policy	A marketplace system would price the damage fossil fuels have on the environment and public health.

Biodiversity

Biodiversity represents all life and its interdependences. It provides a blueprint on how to operate sustainably. In the natural world, a waste output is a nutrient input. The sun's energy and carbon cycles are examples of interrelated systems that benefit life. Human-made systems, on the other hand, can disrupt natural ones. This is evident with the vast burning of carbon-based fossil fuels in our transportation and building sectors. As noted in the introduction, this imbalance of carbon dioxide is threating many aspects of life we have come to rely on. Due to these negative impacts, there is increasing recognition that inclusion of nature needs to be a prerequisite in decision-making. Thus, this section advances strategies to improve biodiversity outcomes by integrated climate planning.

Cities are places where biodiversity is often marginalized by development intensification, industrialization, pavement, and vegetation monocultures. Yet, respecting, conserving, supporting, and enhancing biodiversity brings life to all living organisms within the city and beyond. The city is a part of a larger environment which supplies critical ecosystem services.

These ecosystems services are broken down into four broad categories which include supporting services, provisioning services, regulating services, and cultural services. Examples of such ecosystem services are soil formation, energy from biomass or hydropower, carbon sequestration from the urban tree canopy, and the cultural benefit from living in the natural world.
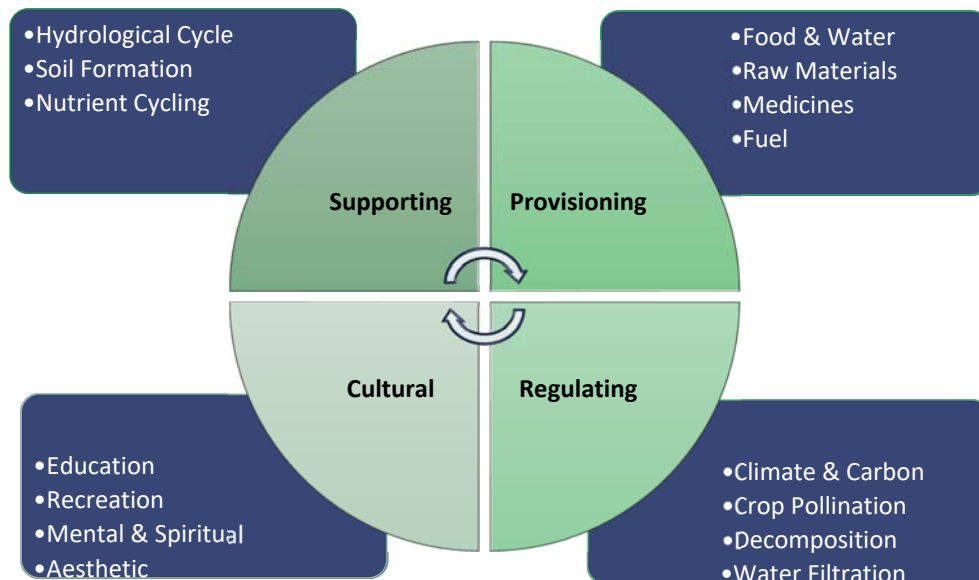
Figure 7. Valuable Services Provided by Nature

Overarching Strategies

B1. Continue to implement policies, programs, and projects as found in the City's official plans. The Sustainability and Natural Resources chapters in the Comprehensive Plan, Waterways Plan, Urban Forestry Management Plan, Integrated Pest Management Plan, and other plans should be followed to make improvements to the community's biodiversity.

> **Goal:** Implement the City's related biodiversity goals and policies as found in official plans
> **Metric:** Number of policies, programs, and projects implemented

B2. Create a Biodiversity Index.[13] Compiling the area's natural characteristics and ecosystem services ("blue and green infrastructure") will provide for a deeper respect and understanding of the value of conserving these resources. It will function as a tool to measure environmental performance, evaluate and design future developments, and consider resiliency and adaptation needs in a warming (changing) climate. Use community partners to assist in completing the baseline index and to track change.

> **Goal:** Assemble a baseline Biodiversity Index and map to use in decision-making and to track change
> **Metric:** Indicators such as blue/green acres or corridors, water and air quality levels, native versus invasive flora and fauna, endangered species, school curriculum in parks, support policies, ecological studies, etc.

B3. Reduce sprawl, loss of biomass carbon sinks (e.g., forests, wetlands, cropland, grassland). Continue to work with Eau Claire County and adjacent towns to protect prime agricultural lands, forests and environmentally sensitive features. Encourage denser infill and redevelopment within the city and compact mixed-use new development on edges.

> **Goal**: Reduce needless geographic expansion of metropolitan area by renewing intergovernmental boundary agreements
> **Metric:** Number of agreements, density lot standards, rate of expansion, number of rural conservation cluster subdivisions outside the Urban Sewer Service Area

Ecosystem Services

Critical Pathway
2030 Target: Protect and enhance the urban forest by increasing tree carbon sequestration by 10% or 1% per year (636 $MTCO_2e$) over the 2013 baseline.
Baseline Activity in 2018: The tree canopy within the city limits covers 24% of land (2013) and sequesters 12,725 $MTCO_2e$ or 1.4% of total emissions.[14]

---

[13] Convention on Biological Diversity at https://www.cbd.int/subnational/partners-and-initiatives/city-biodiversity-index
[14] DNR Community Tree Canopy at http://wi-dnr.maps.arcgis.com/apps/View/index.html?appid=c85ffcd7a1514c0780bd75159caf204b

B4. Maintain and Increase Urban Forestation. The co-benefits of trees are numerous.[15] Whether on public or private lands, maintaining and increasing the city's urban forest offers increased ability to sequester carbon dioxide and reduce energy use.

> **Goal:** Increase tree plantings 1% per year
> **Metric:** Number of trees planted and total tree cover (as measured by Google Earth, i-Tree, DNR), species ability to sequester carbon and energy use decreased

B5. Retain, restore, and enhance natural spaces. Existing natural spaces within urban environments offer increased levels of biodiversity and ecosystem services. A healthier urban ecosystem can be achieved by increasing native plantings in a variety of public and private spaces.

> **Goal:** Increase 5% more natural spaces
> **Metric:** Acres above current baseline of existing natural spaces

B6. Require more natural spaces for new development. To increase biodiversity in new urban development sites or subdivisions, strategies such as providing natural buffers, trees, rain gardens, alternative lawns, flower beds, gardens, and other native grasses and plantings work to store carbon on the land and provide biodiverse habitat.

> **Goal:** A minimum of 5% more naturalized spaces per lot for residential and 10% for non-residential
> **Metric:** Square footage

B7. Increase use of trails as biodiversity corridors. Existing and new trail corridors are excellent places to add no-to-low mow native plant mixes or fescues. Incorporation of taller shrubs and bushes should not compromise safety and regular maintenance.

> **Goal:** Incorporate native grasses and shrubs in 75% of feasible trails, minimum 5% per year
> **Metric:** Percentage land increase per year

B8. Ease barriers to increase alternative lawns. Alternative lawns and native lawns can increase biodiversity by storing carbon and enticing biodiversity such as pollinators, but local regulations or permitting can discourage the practice. Instead, provide education and technical support on best practices to overcome potential public nuisances.

> **Goal:** City Council to eliminate the application process for alternative lawns and update the Forestry Code; at least five new projects in the first year
> **Metric:** Number of projects per year

B9. Increase on-site infiltration and storm water capture. The City follows DNR standards for infiltration and capture of total suspended solids, however there are further opportunities to improve water quality, ground water recharge, and flood control.

> **Goal:** Enforce and enhance water quality regulation and practices in priority watersheds for new development and redevelopment sites
> **Metric:** Percentage change from current infiltration and total suspended solids levels

---

[15] Eau Claire Urban Forest Management Plan, 2010 at https://www.eauclairewi.gov/home/showdocument?id=1360

B10. Increase safe use of grey water. Grey water is gently used water from sinks, showers, or laundry. Common practices are for irrigating outside plants or inside greenhouses.

> **Goal:** Support changes to state plumbing codes to allow grey water reuse systems
> **Metric:** Number of homes and business which use grey water systems

B11. Reduce herbicides, pesticides, fertilizers. Reduce measured pollution levels in local rivers. Continue to make every effort to follow the City's Integrated Pest Management Plan.

> **Goal**: In three years, model nutrient and pollution runoff loading in the city to determine individual reduction level goals
> **Metric**: Loading model and TBD herbicide, pesticide, and fertilizer reduction levels

B12. Support local food, local producers, and urban farmers. Urban agriculture can range from a backyard operation to large-scale community gardens.

> **Goal**: Expand community gardens and on-site residential urban agriculture
> **Metric**: Number of new community gardens and number of applications for beekeeping, chicken coops, etc.

Success Story

Putnam Park offers invaluable biodiversity to the community. With varied topography, bedrock exposures, seepage springs, and a variety of soil types all in close proximity, the park possesses many plant and animal habitats. More than 400 plants, 100 birds in summer, and 23 mammal species have been recorded. Putnam Park is owned by the University of Wisconsin–Eau Claire and was designated a State Natural Area in 1976. (*Claytonia virginica* or Springbeauty is pictured)

© *Frederick Warren King*
May 2017

Residential

Residential homes account for 19% of community-wide greenhouse gas emissions, 29% of electricity consumed and 33% of natural gas used in Eau Claire's buildings. On average, residents paid $1,376 per year on utility energy costs in 2018.

Eau Claire has a mix of housing types. Single-family homes make up 62% of the total housing units, and the median year built is 1970. Rental units comprise 46% of all homes.

The strategies below focus on increasing energy efficiency and renewable energy purchases by local residents. Eau Claire has a strong baseline of energy efficiency and renewable energy activity, largely through participation in Focus on Energy programs that are available statewide.

Overarching Strategies

R1. Increase prevalence of energy-efficient, low-emissions affordable housing. Work with partners and developers to increase awareness of and access to resources for low-carbon-footprint development.

> **Goal:** By 2030, 100% of new affordable housing development in Eau Claire takes advantage of an energy efficiency or renewable energy program or project
> **Metric:** Number of developments participating in programs or projects

R2. Promote the use of the City's Net Zero Energy Building Guide. Deploy trainings and communications to increase awareness and implementation of net zero strategies as found in the guide.

> **Goal:** 30 residential projects have implemented net-zero strategies by 2030
> **Metric**: Number of projects

R3. Support a residential net-zero energy development. Work with stakeholders to develop a residential housing arrangement or subdivision that is energy self-sufficient, with design parameters such as energy efficiency, passive energy, local renewables, storage, and smart home technologies.

> **Goal:** At least one development project by 2030
> **Metric**: Number of projects

Energy Efficiency

Critical Pathway
2030 Targets: 2% electricity savings (4.55 million kWh/year) and 1.4% natural gas savings annually (176,000 therms/year).
Baseline Activity in 2018: 1.5% electricity savings and 0.9% natural gas savings annually.

R4. Increase awareness of energy efficiency among Eau Claire residents. Use communications channels and community ambassadors to promote energy savings to local residents.

>   **Goal:** Conduct two awareness campaigns per year
>   **Metric:** Number of promotions per year

R5. Promote energy audits, energy efficiency rebates, and financial incentives. Work with Focus on Energy, existing service providers, state, and additional utility programs to sign up residents for energy efficiency programs and services.

>   **Goal:** 2,000 participants per year, including 300 home audits
>   **Metric:** Participation in programs

R6. Pass a Home Energy Rating Ordinance. Work with local stakeholders to develop a City policy to provide energy performance transparency for residential homes. This would provide each home with a transparent, apples-to-apples metric for energy use, analogous to miles per gallon ratings for vehicles.

>   **Goal:** Pass a home energy rating ordinance within three years
>   **Metric:** Ordinance passed

Success Story

Western Dairyland offers Weatherization and Energy Assistance programs for income-qualified households. Services include installing insulation, replacing furnaces, repairing inefficient windows and doors, installing LED bulbs, and more. These measures save low-income families an average of $620 per year in heating, cooling, and electric costs. One local participant stated, "When you're hit with a large heating bill in the winter, you start looking at your budget to see what you can cut, and you're faced with some tough choices. I never thought I'd qualify for this program, and I'm so impressed!"

Renewable Energy

Critical Pathway

2030 Target: Convert 200 residential households per year to all renewable electricity (1.7 million kWh/year), and 20 households per year to renewable thermal, including geothermal HVAC and solar thermal (5,000 therms/year).

Baseline Activity in 2018: There were 1,301 total renewable subscribers in 2018 (from Windsource® and community solar gardens) and 12 new renewable sign-ups in 2018 through Focus on Energy.

R7: Increase number of residential subscribers to utility renewable subscription programs. Promote existing programs that allow residents to sign up for 100% renewable electricity through their utility (e.g., Renewable*Connect or Evergreen).

> **Goal:** 100 new subscribers per year (850,000 kWh per year)
> **Metric:** Number of subscribers

R8: Increase privately owned solar. Promote on-site rooftop or ground-mount solar within the city.

> **Goal:** 50 new systems per year (425,000 kWh per year)
>
> **Metric:** Number of systems permitted

R9. Develop new community-sited renewables within Eau Claire and offer subscriptions to residents. Build on success of existing community solar garden, with a focus on promoting subscriptions to local households.

> **Goal:** Install and subscribe 3.5 MW by 2030 (425,000 kWh per year)
> **Metric:** Number of MW subscribed

R10. Support a solar group-buy program in the Eau Claire area. Facilitate a group-buy program, using lessons from previous community experience. Group-buy programs coordinate education and installation schedule across a group of residents, generally for a discounted price on the technology.

> **Goal:** Launch solar group-buy program within three years
> **Metric:** Launch of program

R11. Increase the number of solar-ready buildings in residential new construction. Incentivize or require residential homes that are built to install rooftop solar to avoid future retrofit, through tactics such as the Solar-ready guide, checklists, offering incentives, and exploring state-level code changes.

> **Goal:** Develop incentive offering within four years and build 25 solar ready homes per year
> **Metric:** Number of solar ready homes built per year

R12. Increase adoption of renewable-powered heating, cooling, and hot water technologies. Remove market barriers using education, contractor trainings, and promotion of existing incentives. Technologies include geothermal energy, air source heat pumps, or other electricity technologies fueled by renewable energy.

> **Goal:** By 2030, convert 20 households per year to renewable thermal energy
> **Metric:** Number of homes
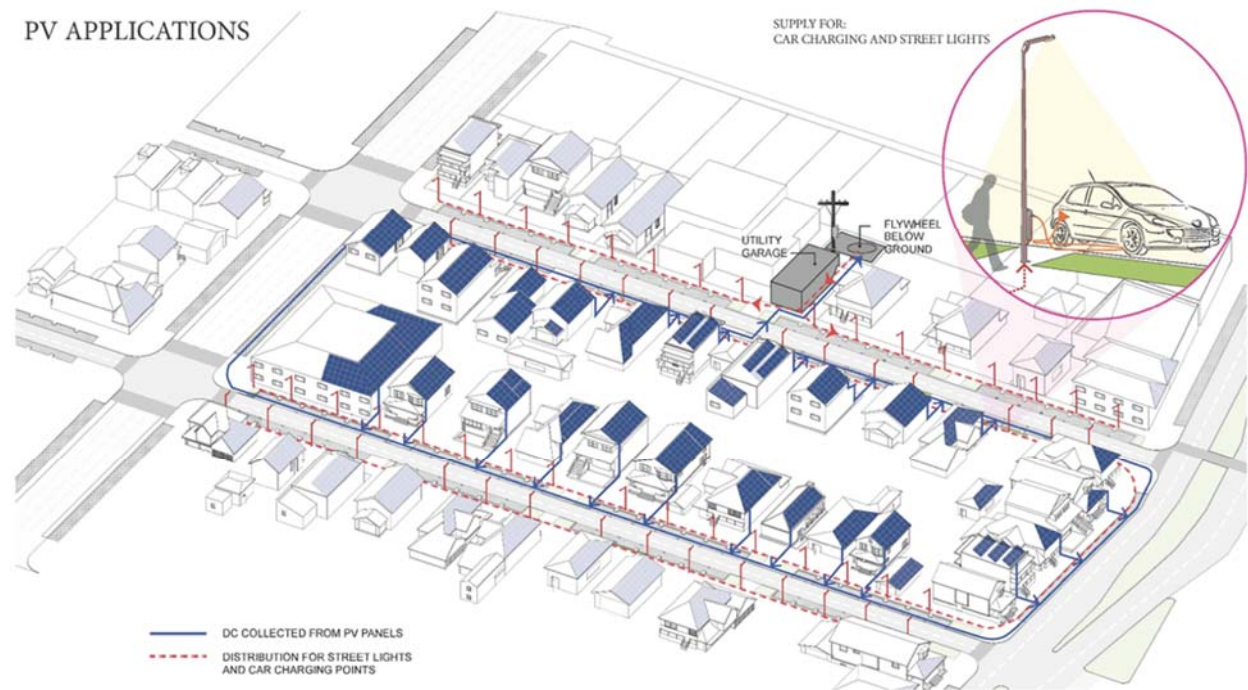
Figure 8. Low-emission, Smart grid, EcoBlock pilot in Oakland, CA at https://rael.berkeley.edu/project/the-eco-block-project/

Commercial, Industrial, and Institutional

This sector includes all non-residential buildings in Eau Claire, such as small and large businesses, institutional buildings such as colleges and schools, and the industrial sector. Overall these sectors accounted for 71% of consumed electricity, 67% of consumed natural gas and 43% of economy-wide carbon emissions for Eau Claire's building energy use in 2018.

Commercial buildings have a strong track record of saving energy. The baseline energy efficiency program activity has been 2.3% savings for electricity and 1% savings for natural gas per year.

Overarching Strategies

C1. Promote the use of the City's Net Zero Energy Building Guide. Deploy trainings and communications to increase awareness and implementation of net-zero strategies as found in the guide.

> **Goal:** 10 net-zero energy commercial projects by 2030
> **Metric:** Number of projects

C2. Support a business recognition program to promote businesses that have taken action in sustainability, especially relating to energy and carbon reductions. Use city and community communications platforms to support and recognize leaders.

> **Goal:** Increase participation in business recognition programs
> **Metric:** Number of city sustainability awards following the REAP framework

C3. Offer and promote resources to reduce the costs of energy efficiency and renewable energy projects, including financing. Promote existing financial resources such as from Focus on Energy, Xcel Energy, or Eau Claire Energy Cooperative, and explore options for the City to help support.

> **Goal:** 25 businesses receive low-cost financing through the City or other sources by 2025
> **Metric:** Number of loans provided

Energy Efficiency

Critical Pathway
2030 Target: Achieve 3% (17.1 million kWh/year) energy savings per year in electricity and 1.5% savings per year in natural gas (380,000 therms/year).
Baseline Activity in 2018: Annual savings of 2.3% for electricity, and 1% for natural gas.

C4. Improve energy efficiency in existing buildings and infrastructure. Coordinate among existing program, financial, and technical resources to increase uptake of energy efficiency.

> **Goal:** 150 utility energy efficiency projects completed annually in Year 1, and increasing to 300 projects annually by 2025
> **Metric:** Participation in energy efficiency programs and services

C5. Improve energy efficiency in new construction and major renovations. Use city communication channels and explore policy options to encourage energy efficiency in new construction and major renovations.

> **Goal:** Increase community awareness of green certification programs for new construction and renovations.
> **Stretch Goal:** All City new construction and renovation projects are built to a green building standard
> **Metric**: Number of projects or permit plans that demonstrate high energy efficiency standards

C6. Increase the number of businesses that track energy use through energy benchmarking. Promote tools to help businesses track energy use and explore policy options to incentivize energy benchmarking.

> **Goal:** All municipal buildings and 50 commercial buildings benchmark annual energy use, 25 commercial buildings publicly share results
> **Metric:** Number of buildings benchmarking and sharing results

<u>Success Story</u>
At their 1882 old paper plant, Cascades Tissue Group has been focused on meeting 2020 corporate goals of 9% energy reduction per metric ton of saleable product. Pictured is a recent paper mill dryer hood replacement that will save 17,421 GJ per year, which is about a 2% decrease in total energy usage plant-wide. The payback will take less than five years and saves around $132,350 annually. This project benefited from a hefty Focus on Energy incentive covering roughly 33% of the total cost. Cascades has a corporate Sustainable Development Plan and is committed to using renewable energy and decreasing carbon dioxide emissions.

Renewable Energy

Proposed 2030 Targets: 15 new renewable electric customers per year by 2030 (2.4 million kWh/year); 5 new renewable thermal customers per year (20,000 therms/year).

Baseline Activity in 2018: There were 14 total renewable subscribers in Eau Claire in 2018 (Windsource® + community solar gardens), and two new renewable sign-ups in 2018 through Focus on Energy.

C7. Increase the number of on-site customer-owned solar photovoltaic installations at existing buildings and sites. Educate and consider policies to encourage businesses to install rooftop, parking lot, or other on-site solar.

> **Goal:** Five new installations each year (802,500 kWh per year)
> **Metric:** Solar installations at commercial, industrial, or institutional sites

C8. Increase the number of solar-ready buildings in commercial, industrial, and institutional new construction. Use communication channels such as the solar-ready guide, checklists, and explore policy options to encourage solar-ready design in new construction and major renovations.

> **Goal:** 10% of new construction and major renovation projects are solar-ready by 2025
> **Metric:** Number of solar-ready projects

C9. Increase the number of commercial subscribers to utility renewable subscription programs (e.g., Renewable*Connect or Evergreen). Encourage commercial customers to sign up for renewable energy subscriptions by marketing the ease of sign-ups, and consider options to reduce the cost to consumers.

> **Goal:** 10 new customers per year (1,605,000 kWh per year)
> **Metric:** Number of new customers

C10. Increase adoption of renewable-powered heating, cooling, and hot water technologies, including geothermal projects. Consider incentives to reduce the costs of renewable-powered heating, and explore potential project sites in Eau Claire.

> **Goal:** Five new projects per year
> **Metric:** Number of projects

Transportation

In 2017, the EPA found that the transportation sector accounted for 29% of all greenhouse gas emissions nationally. In Eau Claire, that percentage in the 2015 baseline year was 34%. Switching to non-fossil fuels, specifically vehicles running on cleaner electricity, is one important pathway to reduce carbon dioxide (CO_2), particulate matter (PM_{10}) and smog (O_3). Co-benefits of these actions will improve air quality and health risks related to respiratory illnesses and premature deaths.

The REAP Steering Committee chose to focus on vehicle electrification strategies instead of plant-derived biofuels, mainly corn-based ethanol and bio-diesel. Although these fuels are classified as renewable energy, actual consumption is blended with gasoline or diesel making it difficult to account for carbon emissions at the local level. There are greater challenges as well with ethanol's higher energy input-to-energy output manufacturing process and that corn is an important global food supply. On the other hand, research into non-food based advanced cellulosic bio-fuels (e.g., grasses, wood, algae) may hold long-term promise if successfully commercialized.

A second key pathway to reducing transportation emissions is designing a city so that it is easier to walk, bike and take transit. Eau Claire's downtown is an example of where it might be feasible to live and work in close proximity. The City's 2015 Comprehensive Plan's Sustainable Growth policies advance the goal of intensifying the pattern of land use in areas of the city to increase the use of walking, bicycling, and transit.[16] Major "Activity Centers" like the mall area and the medical and educational campuses along West Clairemont Avenue are opportunities to create higher density development, particularly with employment, shopping, and multi-family housing served by transit, sidewalks, and bicycle routes.

This section starts with land use strategies because a city's transportation vehicle miles traveled (VMT) emissions are highly contingent on where housing, jobs, and services are located.

Critical Pathway
2030 Targets: Electric vehicles increase to 10% of VMT (8,000 EV's by 2030) and an increase in vehicle occupancy from the Midwest average of 1.63 persons per vehicle to 2 (14.3 million VMT/year) (39,213 VMT/day) (Reduce 3,900 trips a day).
Baseline Activity in 2018: Total community VMT totaled 728,824,567 with about 92% of those miles coming from gasoline-fueled vehicles.

Land Use

T1. Densify the city. A denser city is more energy efficient and allows for easier use of alternative modes of transportation like walking, biking, and transit. Some benefits include reduced VMT and air pollution. Determine average density baseline data in each census track of city to establish density goals, development opportunities, and policies to increase dwelling units and jobs.

---

[16] Eau Claire Comprehensive Plan 2015 Land Use & Growth Management Plan at https://www.eauclairewi.gov/home/showdocument?id=10517

Goal: Increase the average density of the city, especially in areas most suitable
Metric: Percentage change of population, dwelling units, households, VMT, jobs

T2. Incentivize and require more compact and mixed-use development. A city's built form plays a large role in determining travel outcomes. One that is more compact and that provides jobs and services close to housing will foster more transportation options. The City's Traditional Neighborhood Development (TND) is a template to use for this type of development and provides density and affordable housing bonus incentives.

Goal: At least five new developments achieving compact and mixed-use development using TND ordinance or the Mixed-Use Development Overlay District (MX)[17]
Metric: Number of households per acre and number of uses per development

T3. Reduce required parking. Consider allowing developers to reduce minimum required parking by providing justification analysis. Examples could range from affordable and special needs housing to property managers contracting with transit, ride-share, and delivery services. Transportation Demand Management strategies could be used as well.

Goal: Reduce number of parking spots and single-occupancy vehicles (SOV) required per the zoning code
Metric: Number of parking spots per development, SOV VMT reductions

Alternative Modes of Transportation

T4. Increase the City's bike- and pedestrian-friendly environments. The City's Bicycle and Pedestrian Plan advances many strategies and provides detailed map improvements to the City's infrastructure. One policy example is called Complete Streets, where consideration is given to designing roads with various mobility user groups.

Goal: Implement Complete Streets policy recommendation by 2020
Metric: Miles of bike and walking trails and number of citizens who bike and walk to work using census data; number of Complete Street miles.

Success Story
SHIFT Cyclery & Coffee Bar built their business on serving people who are passionate about coffee, community, and bicycling. SHIFT offers a full-service bicycle repair shop, craft coffee bar, and creative lounge in downtown. They host bike ride events that promote how to use the city's bike infrastructure and advocate for improvements on the City's Bicycle and Pedestrian Advisory Committee.

---

[17] City of Eau Claire's Traditional Neighborhood Development Chapter at https://www.eauclairewi.gov/home/showdocument?id=25275

T5. Increase neighborhood walkability. Walk Score® is a tool to analyze how walkable it is to services from housing.[18] With a 2019 score of 34, Eau Claire is considered a car-dependent city.

> **Goal:** Increase City's Walk Score by 10 points
> **Metric:** City Walk Score

T6. Launch bike- or scooter-share programs. Private companies may find opportunities and or partnerships in the city to make these programs more feasible.

> **Goal:** At least one scooter-share company or bike-share company operating by 2022
> **Metric:** Number of bikes and scooters deployed and yearly miles travel via these services

T7. Improve transit ridership and access. The City's 2020 Transit Development Plan (TDP) will examine system and service improvements to increase ridership and improve access for the public.

> **Goal:** Increase ridership by 10% by 2021 (approximately 100,000 rides)
> **Metric:** Ridership levels and VMT

T8. Explore on-demand micro-transit. Micro-transit is an on-demand public service that does not follow fixed-routes coverage, thus being more flexible in trip origins and destinations.[19] The City will study the concept in its TDP as a possible service improvement.

> **Goal:** Determine if public micro-transit is feasible by 2021
> **Metric:** Percentage of city residents supported by improved service coverage and frequency

T9. Explore a zero-fare transit system. Examine the viability of this option to increase ridership, especially along highest-frequency routes, connected activity centers such as the mall with downtown, or on routes with most vehicle congestion.

> **Goal:** Implement one zero-fare route
> **Metric:** Number of riders

Alternative Fuel Vehicles

T10. Implement the EV roadmap. This REAP sub plan will detail focus area and strategies that advance electrification of vehicles in the community and for the municipality.

> **Goal:** Reach the City's goal of 10% EVs by 2030; 15% for the municipality
> **Metric:** Displaced gasoline and diesel VMTs using DMV registrations of battery electrics (BEVs) and plug-in hybrid electrics (PHEVs)

T11. Conduct broad community outreach on electric and alternative fuel vehicles.

> **Goal:** Hold public events to increase education on EV for citizens and fleets
> **Metric:** Number of events per year

---

[18] Walkscore® at https://www.walkscore.com/WI/Eau_Claire
[19] America Public Transportation Association's definition of micro-transit at https://www.apta.com/research-technical-resources/mobility-innovation-hub/microtransit/

T12. Increase local purchases of electric vehicles. Dealers work to increase more EVs on lots and partner with local utility companies, higher educational institutions, units of local government, businesses, etc. to improve sales.

> **Goal:** EVs reach 10% of sales in city by 2030
> **Metric:** Number of BEVs and PHEVs purchased

T13. Foster EV car- or ride-sharing and taxi programs. Examples of this can vary. In Madison, a cab company is switching their fleet over to Teslas.[20] In the Twin Cities, a nonprofit car-sharing service called HourCar® is transitioning their fleet to EVs by 2020 in partnership with Xcel Energy.[21]

> **Goal**: Establish a car-sharing program by 2025
> **Metric**: Participation in the program

T14. Expand electric light-duty vehicle charging infrastructure. Having ample public and private charging locations is critical for marketplace confidence.

> **Goal:** Install at least three DC fast chargers, 500 residential Level 2s, and 25 chargers for light-duty fleets
> **Metric:** Number of and types of chargers installed

T15. Work with utility providers to promote charging infrastructure and competitive rates. Rates that incentivize fuel switching can make EVs more economical.

> **Goal:** Support utilities through marketing, education, and incentivizing the marketplace
> **Metric:** Number of programs

T16. Require and prioritize parking for electric vehicles. Such regulation can increase public awareness of EVs and save electrical line extension costs.

> **Goal:** Pass an ordinance requiring EV chargers depending on land use, number of stalls required, and locational preference
> **Metric:** Number of EV stalls and type of chargers installed

T17. Promote investing in carbon offsets for aviation. Airplane emissions are a major source of carbon.

> **Goal:** Promote awareness of programs that offset carbon from air travel[22]
> **Metric:** Number of offsets at Chippewa Valley Regional Airport

---

[20] Green Cab Madison at https://greencabmadison.com/drive/

[21] Energy News Network at https://energynews.us/2019/04/22/midwest/xcel-program-will-work-to-electrify-car-sharing-and-government-fleets/

[22] United Eco-Skies® Carbon Choice program at https://www.united.com/ual/en/us/fly/company/global-citizenship/environment/carbon-offset-program.html

Waste

Although waste is a relatively small portion of the community's emissions, there is potential to reduce methane by avoiding the landfilling of organics and other waste. The 2015 baseline greenhouse gas inventory shows CO_2e emissions from solid waste make up about 3% of the total for the community or roughly 26,471 MT CO_2e. It should be noted that the waste category for the community greenhouse gas (GHG) inventory only considered in-boundary emissions from Seven Mile Creek Landfill. The municipal GHG inventory in Appendix D measured the emissions from the wastewater treatment plant, which has made significant reductions in GHGs by capturing methane to assist in powering the operations.

Critical Pathway
Proposed 2030 Targets: Divert 50% organic and 50% of construction and demolition waste streams.
Baseline Activity in 2018: Baseline from 2009 DNR state waste characterization study: Organics (23%) and Construction & Demolition (21%).

W1. Use 100% of wastewater treatment plant biogas. The City's wastewater treatment plant can use 20% more of the methane currently generated from its anaerobic digestion process.

> **Goal:** Install or update required equipment to capture and generate heat and power from 100% of biogas
> **Metric:** Gas captured for heat (therms) and electricity (kWh)

W2. Continue land application of bio-solids. This product from the City's wastewater treatment plant is a natural fertilizer and saves on landfill costs. During the last five years, over 37 million gallons of bio-solids have been land-applied on farm fields.

> **Goal:** Continue to seek ways to increase the amount of bio-solids land-applied
> **Metric:** Millions of gallons

W3. Establish a zero-refrigeration leak goal. Refrigerants such as hydrofluorocarbons have very high global warming potential, sometimes thousands of times higher compared to CO_2. Partnerships through existing programs such as EPA's GreenChill certification enables industry, retailers, and others to reduce or eliminate leaks.[23]

> **Goal:** Establish goal within three years and increase participants in programs like GreenChill
> **Metric**: Reports that identify the volume of leaks and number of GreenChill companies

W4. Transition haulers to capture compostables. Work with stakeholders to explore mechanisms to capture organic compostables at higher rates. Options could include greater curbside pickups or community composting transfer sites.

---

[23] EPA GreenChill Partnership at https://www.epa.gov/greenchill

Goal: 50% of organics diverted
Metric: Weight of the compost

W5. Increase recycling of construction and demolition (C&D) materials. Diverting C&D materials from landfills is an important part of sustainable waste management. Supporting innovation and partnerships to increase C&D material recycling may offer new markets and local circular economic development.

Goal: Increase non-residential C&D recycling to 75% per job site by 2030
Metric: Reported volumes of recycled materials to the County

W6. Explore organized municipal waste collection. Collection zones can increase recycling rates, keep costs down for residents, reduce fuel usage and pollution, and reduce wear and tear on roadways.[24]

Goal: Examine if an organized municipal waste collection program is feasible
Metric: Cost-benefits to public and increased diversion of compostable and recycled materials

W7. Explore building a Materials Recovery Facility (MRF). Exploring current and developing new remanufacturing markets to support a regional MRF will be important to make the process economical. Partnerships with existing local businesses to use recycled material may aid in the development of a more sustainable and circular business model while reducing landfilled materials and greenhouse gases.

Goal: Create a business plan to assess feasibility and secure end markets for recycled materials
Metric: Number of business partnerships and end markets created

Success Story

Earthbound Environmental Solutions unlocked marketplace barriers to divert local residential and commercial organics via a curbside pickup service. A million pounds of organics have been landfill-diverted since 2015. The family-owned business has successfully grown from its beginnings at the Chippewa Valley Business Innovation Center to expanding into adjacent cities and managing a fully licensed 52-acre compost facility. Earthbound also provides waste audits, waste diversion marketing support, and zero-waste event coordination.

---

[24] Benefits of Organized Collection at https://www.pca.state.mn.us/sites/default/files/leg-12sy1-06.pdf

Cross-Cutting Strategies

In addition to the strategies already mentioned, the following actions have implications across all sectors. When achieved, these will support all or most areas of this plan.

CC1. Continue to support utilities' carbon-free and renewable energy goals. Xcel Energy and Dairyland Power (Eau Claire Energy Cooperative) have plans to use more renewables and reduce carbon emissions. The decarbonization of the electric grid is a primary pathway to meeting the City's goals.

CC2. Continue to support a social cost of carbon in climate and energy policy. The City Council passed a resolution in favor of a carbon fee and dividend marketplace system proposed under the bipartisan Energy Innovation and Carbon Dividend Act.[25]

CC3. Create a public outreach campaign. For the community to act, more knowledge and consideration is needed about the problem, its effects, and actions the community can take.

CC4. Provide implementation budget support. Funding is critical to help implement outreach and action programs.

CC5. Form a local partnership collaborative. The area has multiple partners that share similar carbon reduction goals. Working together on climate change through sharing knowledge, leveraging abilities, and determining possible joint projects will be important to accelerate change and innovation.

CC6. Work with local institutions to train the next generation of the environmental workforce. Partner with local institutions to offer and support curriculum dedicated to training the next generation of environmental workers.

CC7. Continue to use partnerships and tools to track required data. Quality and timely data is critical to understand progress and to evaluate the effectiveness of the strategies and impact on goals.

CC8. Transition to real-time or time-of-use energy billing for all customers. Smart meters will enable customers to have greater control of their energy use and related expenditures.

CC9. Hire additional City staff to work on achieving the goals and targets of this Renewable Energy Action Plan. Dedicate full-time City staff to support the strategies and goals of this plan.

CC10. Improve development review staff reports to include evaluation of appropriate plan strategies. Options could include a scoresheet or calculator to assist applicants and decision-makers.

---

[25] Energy Innovation and Carbon Dividend Act at https://energyinnovationact.org/how-it-works/

PROJECTED IMPACT AND TIMELINE

Modeled Critical Pathways

Critical pathways were modeled to develop a preferred scenario to reach the 30% by 2030 reduction target. Along with the pathways, forecasted carbon intensity[26] provided by Xcel Energy was used to determine future carbon emissions associated with grid electricity.

Below is the table of the critical pathways which were modeled for this plan. If the Eau Claire community is to achieve the emission reduction targets there will have to be a total reduction of consumed electricity of 231.3 million kWh and 5.92 million therms for the residential and commercial and industrial sectors by 2030. An additional 41 million kWh of renewable electricity and 250,000 therms will need to be replaced with renewable energy. The transportation modeling shows a need to reduce total vehicle miles traveled (VMT) by 143 million, and increase electric vehicles to 10% of VMT by 2030 (see EV Roadmap for more).

Year	Carbon Intensity (Lbs. CO_2/MWH)
2015	895
2019	910
2023	758
2025	522
2027	408
2030	220

Table 1. Xcel Energy's Carbon-free Forecast

Sector	Modeled Critical Pathways to 2030	Total Unit Reduction
Residential Energy Efficiency	**Electricity**: 2% goal per year **Natural gas**: 1.4% goal per year	45,518,516 kWh 1,760,023 Therms
Residential Renewable Energy	**Electricity**: 200 residential households to 100% renewable electricity per year **Thermal:** 20 new renewable thermal systems per year	17,000,000 kWh 50,000 Therms
Commercial Energy Efficiency	**Electricity**: 3% goal per year **Natural Gas:** 1.5% goal year	170,907,752 kWh 3,795,828 Therms
Commercial Renewable Energy	**Electricity:** 15 new commercial and industrial renewable electric customers per year **Thermal:** 5 new renewable heating systems per year	24,000,000 kWh 200,000 Therms
Transportation Vehicle Occupancy	**Vehicle Occupancy:** Increase vehicle occupancy from the Midwest average of 1.63 people per vehicle to 2 [27]	143,130,000 VMT
Transportation Electric Vehicle	**10% EV VMTs:** 8,000 Electric Vehicles by 2030	30,000 MT CO_2
Grid Decarbonization	**Electricity:** From 2019 to 2030 projected to be 75% carbon-free (value for residential and commercial)	220,000 MT CO_2

Table 2. Modeled Critical Pathways – Total Reductions in 2030

---

[26] Carbon intensity is the measure of pounds of CO_2 per megawatt hour. See Appendix C for how forecasted carbon intensity factors were used in modeling.

[27] Federal Highway Administration's National Household Travel Survey, 2017 at https://nhts.ornl.gov/tables09/ae/work/Job90828.html

Figure 9 represents historic emissions from 2015-2018 and a modeled forecast from 2019 through 2030. The year 2019 energy and emission data were determined through averages of the historic years and will be updated annually as new community energy reports are available for tracking and monitoring.[28] The forecast represents all of the pathways in Table 2 in terms of reductions.[29] At 36% reduction, from the baseline, the goal can be met.
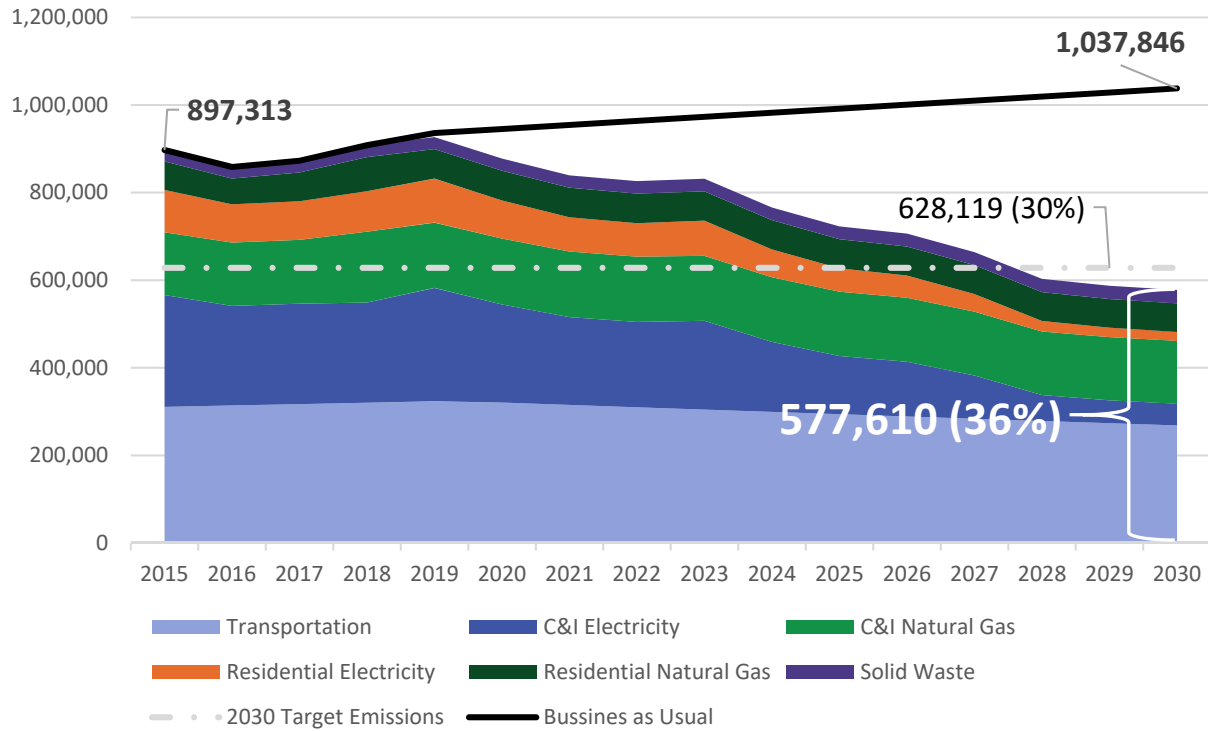
Figure 9. Emission Modeling Forecast in 2030 (Metric Tons of CO_2e)

Sectors (Metric Tons CO2e)	2019	2022	2024	2026	2028	2030
Transportation	323,126	309,606	298,951	288,497	278,239	268,173
C&I Electricity	259,129	194,856	159,764	125,025	59,377	49,508
C&I Natural Gas	149,078	149,001	147,632	146,265	144,919	143,583
Residential Electricity	100,459	76,607	63,689	50,532	24,329	20,562
Residential Natural Gas	67,310	67,388	66,797	66,210	65,629	65,052
Solid Waste	27,546	28,381	28,951	29,533	30,127	30,732
Total	926,648	825,839	765,784	706,062	602,620	577,610

Table 3. Emission Forecast with 75% Grid Decarbonization in 2030

---

[28] Transportation emissions were determined using ICLEI ClearPath software. See Appendix F for detail.
[29] Grid electricity modeling only represents CO_2 while the rest of the sectors represent CO_2e

Figure 10 represents the reduction percentages in each of the sectors against total emission reductions. Reductions in electricity emissions are largely due to the decarbonization assumptions which were used to align with Xcel Energy's carbon reduction goals by 2030. Grid decarbonization is forecasted to be reduced by roughly 75% between 2015-2030.[30] Of the total emission reductions from 2019-2030, the electricity sector represents roughly 83% of the total emission reductions for the community. This reduction assumes the modeled critical pathways for energy efficiency, renewable energy adoption, transportation and the 75% reduction in grid decarbonization.
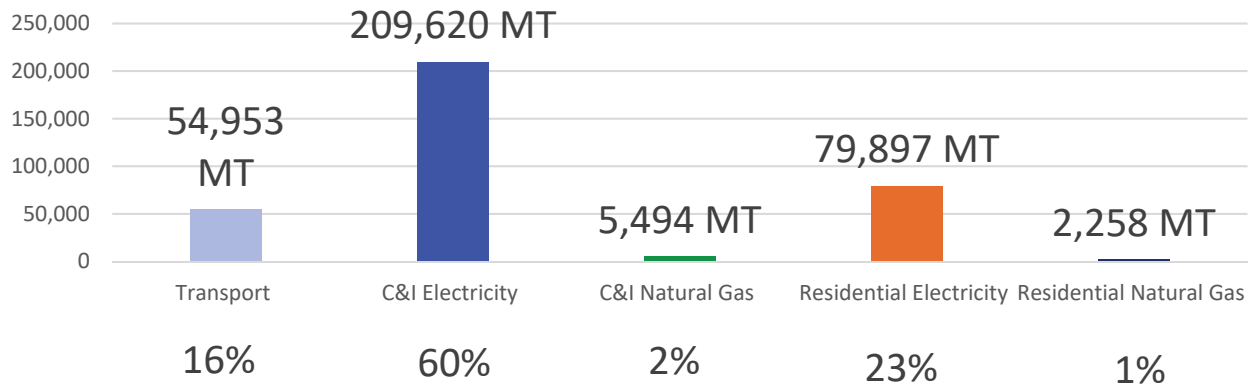
Figure 10. Metric Tons (MT) of CO2e Reduction Total & Percent Breakdown by Sector from 2019-2030

Success Story

Xcel Energy's industry-leading carbon reduction goals play a key role in Eau Claire's ability to significantly reduce emissions by 2030. This is due in part to their nation-leading wind portfolio, which includes 2,357 megawatts of wind in the Upper Midwest. Their Grand Meadow wind farm, completed in 2008 near Dexter, MN, is 100 MW – enough to power 52,000 homes, and they continue to add low-cost clean wind energy to the system.

[30] See Table 1.

Emissions Outlook 2030

If the strategies in the plan are all accomplished, there would be a significant change to the profile of the carbon inventories by 2030 and beyond. Grid decarbonatization would significantly reduce the percentage of total emissions making the commercial sector a much smaller part of the whole. This would reduce the total share of emissions from 44% down to 34% for the commercial (includes industrial) sector. The transportation sector will become the largest contributor to the total share of carbon emissions and is projected to increase by roughly 11%. It should be noted that emissions associated with waste will increase in the share of total emissions simply because it followed a 1% growth assumption throughout the forecast and no modeled pathway strategies were used.

Figure 11. Emission Forecast by Sector Metric Tons CO2
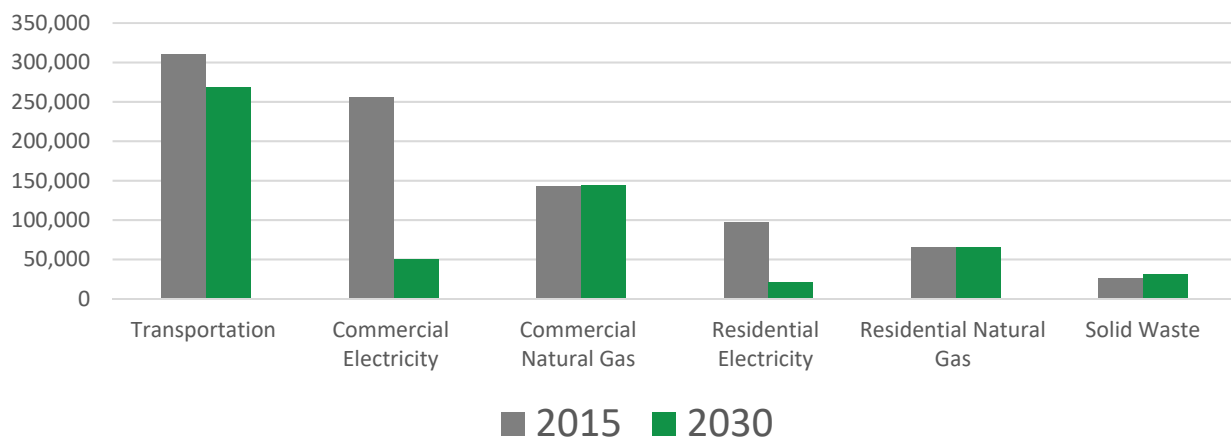
Figure 12. Baseline & Forecasted Carbon Metric Tons CO2 Comparison by Sector and Energy 2015 & 2030

Renewable Energy

Unlike the carbon drawdown targets, there are no interim renewable energy goals to obtain 100% by 2050. In 2015, the city had an energy use baseline of about 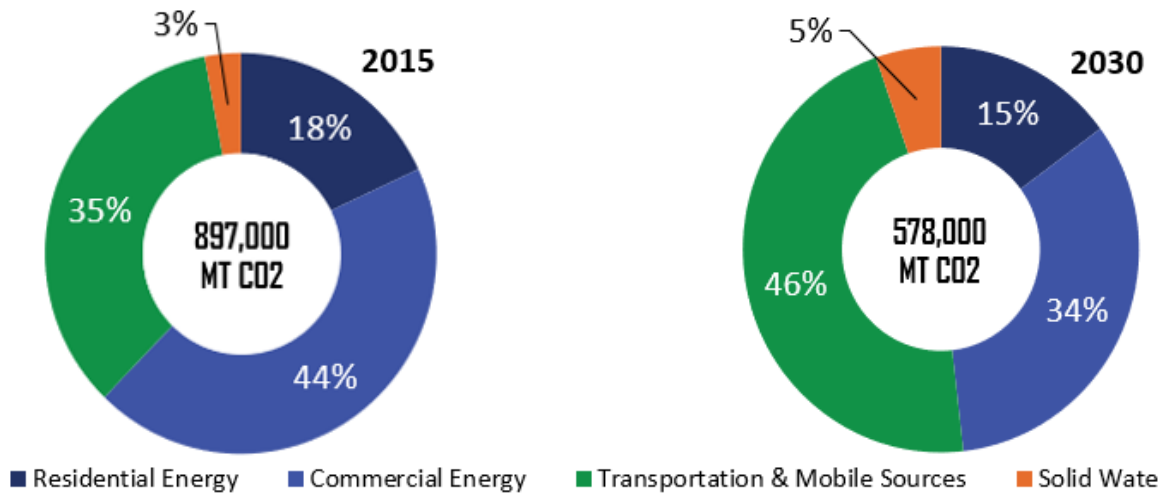6% MMBTU (Million British Thermal Units) counted for as renewable energy. This includes all energy measured in the carbon inventory. The majority share was the 21% of grid electricity supplied by Xcel Energy. Their current Certified Renewable Percentage (CRP) Eau Claire can take credit for now is 23%. Xcel retires Renewable Energy Certificates (RECs) on behalf of their customers to compile the CRP.[31] Locally installed on-site distributed generation systems and renewable subscription programs were insignificant contributions in 2015.

The following charts illustrate the critical pathways comprising renewables (listed on page 36) modeled against the baseline. Under their July 2019 Integrated Resource Plan (IRP) filing at the Minnesota Public Utilities Commission (PUC), Xcel Energy projects supplying a CRP electricity value of 60% by 2030. How this impacts the community's renewable energy goal is important. It would more than double the city's 2015 renewables, and makes the biggest difference in building consumption with 25% renewables.

Renewable Energy Forecast 2015 to 2030

■ Fossil MMBTU   ■ Renewable MMBTU
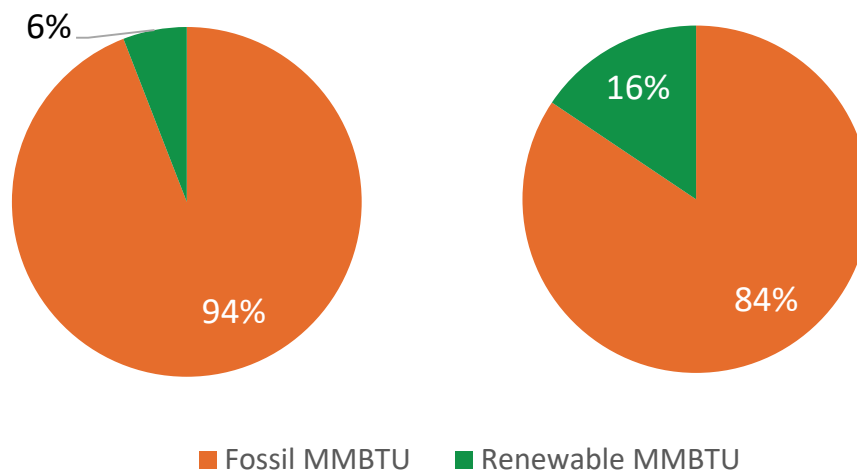
Sector	2015 Renewable	2030 Renewable
Residential	175,000 MMBTU	485,000 MMBTU
Commercial	459,000 MMBTU	1,097,000 MMBTU
Transportation	0 MMBTU	48,000 MMBTU

Figure 13. Renewable Energy MMBTU Forecast 2015-2030

---

[31] https://www.xcelenergy.com/staticfiles/xe-responsive/Energy%20Portfolio/Renewable%20Energy/19-03-108%20WI%20RenewableCredit-IS-p8.pdf

Buildings Renewable Energy 2015 to 2030
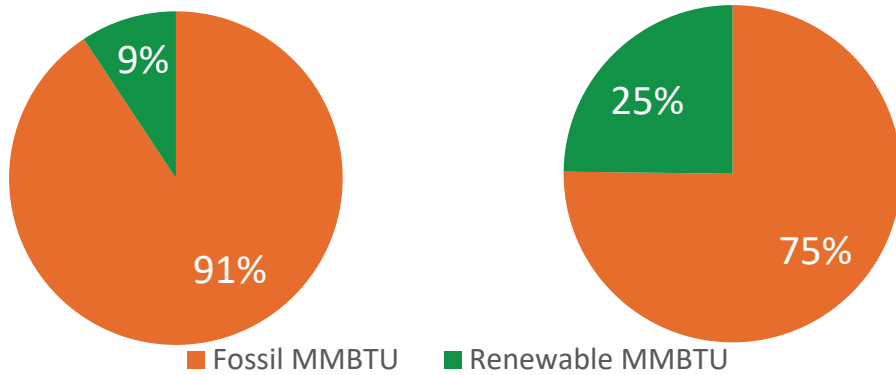
Figure 14. Renewable Energy MMBTU Building Forecast 2015-2030

Fuel switching to electricity in the transportation sector will have little effect however, even with 10% of all vehicle miles travelled (VMT) running on the CRP. This area along with heating and industrial processes, which largely rely on oil and natural gas, present the most difficult challenges in meeting the REAP goals. How this will be accomplished remains to be fully understood but more utility and distributed generation is needed, along with federal and state policy change, greater conservation, technological innovation, electrification, and energy storage. These all will become essential critical pathways for the two decades beyond 2030. See Long Term Strategies Appendix B for more discussion.

Transportation Renewable Energy 2030
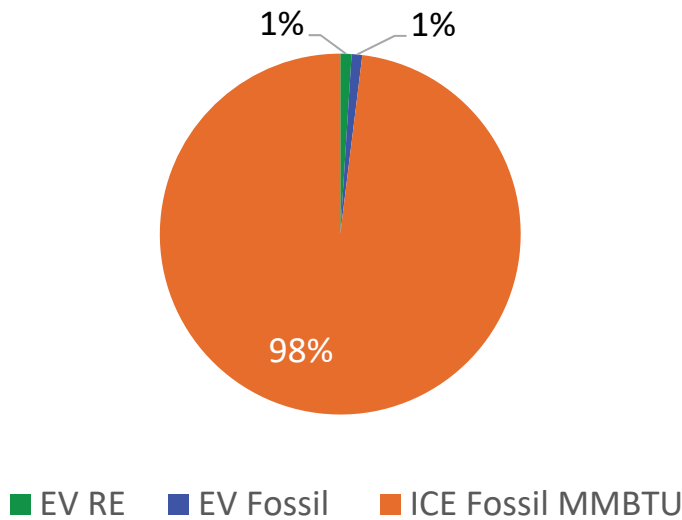
Figure 15. Renewable Energy MMBTU Transportation Forecast 2030

PLAN IMPLEMENTATION

Major Milestones in Years 1–10

The REAP Steering Committee, Sustainability Advisory Committee, project planning team, and City staff identified the following major milestones to track plan progress during implementation. General feasibility as well as human and fiscal resource capacity were also considered. The action strategies have been prioritized according to their anticipated implementation time horizon. This arrangement provides structure, expectations, and flexibility when developing individual work plans or projects for the City. Annual work plans that relate to this plan include those of the Sustainability Advisory Committee, City Council, Plan Commission, and likely others. City staff assist these bodies to incorporate various REAP tasks into work plans and identify those responsible for carrying them out.

It is important to note that it is everyone's job to fight climate change. The City cannot do it alone. Residents and businesses can use this plan to provide direction in their own commitments and actions. Many of these strategies will require working closely together and with community partners. As mentioned, Eau Claire County, Eau Claire Area School District, University of Wisconsin–Eau Claire, and Xcel Energy all have major carbon-neutral goals. It will be vital to work with the Eau Claire Energy Cooperative, Focus on Energy, Western Dairyland, Chippewa Valley Technical College, Eau Claire Area Chamber of Commerce, hospitals, developers, and more depending on the given task.

Biodiversity

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
B1. Continue to implement policies, programs, and projects as found in the City's official plans	● Follow existing City plans ● Implement policies, projects, and programs ● Update plans when needed ● Make sure all three guiding principles are followed	1–2 Years
B2. Create a Biodiversity Index	● Form partnerships ● Determine index parameters ● Create and approve index ● Use index to inform plans and projects	5 Years
B3. Reduce sprawl, loss of biomass carbon sinks	● Work with towns and county ● Renew intergovernmental boundary agreements ● Compact development increases in city	1–2 Years
B4. Maintain and increase urban forestation	● Restrict major loss of tree canopy ● Track environmental and socioeconomic changes to resource ● Plant trees greater than net annual total	1–2 Years
B5. Retain, restore, and enhance natural spaces	● Educate community on best practices and benefits of natural spaces ● Inventory existing spaces devoid of biodiversity ● Plant native plantings in public locations	5 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
B6. Require more natural spaces for new development	• Require in new planned developments • Amend related zoning ordinances • Make observable changes to urban landscape	5 Years
B7. Increase use of trails as biodiversity corridors	• Analyze trails for improvements • Determine funding and operational needs • Increase plantings per recommendations	5 Years
B8. Ease barriers to increase alternative lawns	• Amend the ordinance to element the required permit • Provide education and best practice tips	1–2 Years
B9. Increase on-site infiltration and storm water capture	• Enforce current water quality DNR standards • Study measures above basic code • Analyze improvements to priority watersheds • Enact recommendations	5 Years
B10. Increase safe utilization of grey water	• Support State policy change	10 Years
B11. Reduce herbicides, pesticides, fertilizers	• Continue to enforce existing State and City policies and plans • Model storm water runoff in the community • Determine pollutants and percentage reductions	5 Years
B12. Support local food, local producers, and urban farmers	• Work with user groups to increase community gardens • Approve operating agreements, if in public spaces • Keep urban agriculture permits low or cost-neutral	5 Years

Residential Sector

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
R1. Increase prevalence of energy-efficient, low-emissions affordable housing	• Meet with affordable households and housing developers to share resources and understand barriers to energy efficiency or renewable energy • Promote energy efficiency and renewables via programs geared toward income-qualified housing	2 Years
R2. Promote the use of the City's Net Zero Energy Building Guide	• Provide training to area builders with local builders association • Develop incentives or RFP contest • Work with CVTC's residential construction program to design a prototype house • Complete 30 net zero energy projects by 2030	2 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
R3. Support a residential net-zero energy development	● Meet with interested parties to assess feasibility ● Identify feasible sites, such as Gateway Business Park excess land, and determine final location ● Issue developer RFP ● Initiate site development by 2030	4 Years
R4. Increase awareness of energy efficiency among Eau Claire residents	● Send city communications with energy savings tips ● Host at least one resident workshop ● Identify funding options for net-zero demonstration home ● Launch eco-teams program	1 Year
R5. Promote energy audits, energy efficiency rebates, and financial incentives	● Launch informational website for energy efficiency resources ● Establish fund to buy down the cost of home energy efficiency measures	1 Year
R6. Pass a home energy rating ordinance	● Host listening sessions with stakeholders ● Provide draft recommendations on ordinance ● Pass ordinance in Year 3	3 Years
R7. Increase number of residential subscribers to renewable subscription programs	● Identify and engage key local partners for promotional campaign ● Develop informational materials ● Launch city-wide challenge	2 Years
R8. Increase privately owned solar	● Educate about solar using the City's Solsmart website resources ● Promote solar using the City's Solar guide and PV calculators	1 Year
R9. Develop new community-sited solar within Eau Claire and offer subscriptions to residents	● Identify possible site locations within the City ● Facilitate a group of potential partners ● Groundbreaking on solar garden ● Complete subscriptions of 3.5 MW by 2030	3–5 years
R10. Support a solar group-buy program in the Eau Claire area	● Write a summary of lessons learned and any proposed changes from current program, including feedback from local solar installers ● Launch third solar group buy program that incorporates lessons from first two ● Develop promotional material	1–3 Years
R11. Increase solar-ready buildings in new residential construction	● Conduct listening sessions with the home builders association and architects, among others ● Distribute the Solar-ready guide/checklist through city channels ● Evaluate code and financing policy options at the local and state levels ● Develop a possible incentive on building permits	4 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
R12. Increase adoption of renewable-powered heating, cooling, and hot water technologies	● Publish technical information guide ● Identify potential funding for renewable heat feasibility study ● Develop new homeowner packet ● Utilities provide incentives	6 Years

Commercial, Industrial, & Institutional Sector

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
C1. Promote the use of the City's Net Zero Energy Building Guide	● Deploy trainings and communications ● Develop incentives or RFP contest ● Complete one net-zero project by 2022	2 Years
C2. Support a business recognition program to promote businesses that have taken action in sustainability, especially relating to energy	● Solicit input from businesses to determine structure and value of a recognition program ● Establish guidelines for a recognition program ● Identify key partners to promote program ● Recruit businesses to participate	3 Years
C3. Offer and promote resources to reduce the costs of energy efficiency and renewable energy projects, including financing	● Establish a city financing mechanism for business energy efficiency and renewable energy projects ● Explore models to use city funding to buy down interest rates on energy efficiency and renewable energy projects	4 Years
C4. Improve energy efficiency in existing buildings and infrastructure	● Design and launch a targeted campaign to encourage business to save energy ● Develop and promote targeted information for hospitality, health care, and education sectors on ENERGY STAR® equipment return on investment, incentives, and financing options ● Partner with Chippewa Valley Technical College, Xcel Energy, Focus on Energy, and others to reduce the cost of service through rebates and technical assistance	1 Year
C5. Improve energy efficiency in new construction and major renovations	● Promote the City's Net Zero Energy Building Guide ● At least one new construction project is built to net-zero standards ● Explore policy options to integrate energy efficiency into project approval process for new construction and major renovation, especially in cases where the developer requests a change in zoning or is receiving public funding	5 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
C6. Increase the number of businesses that track energy use through energy benchmarking	● Explore city benchmarking policy options ● Benchmark and share municipal building energy use to lead by example ● Launch technical assistance services for energy benchmarking, including technical support for data tools and platform for sharing results	5 Years
C7. Increase the number of on-site customer-owned solar photovoltaic installations at existing sites	● Establish and promote a renewable energy resource center with connections and information for local businesses ● Evaluate financial benefits such as tax incentives or cost reductions in the permitting process for businesses that install on-site renewable energy ● Identify and study potential project location sites (i.e., businesses with large parking lots or rooftop space) and conduct target outreach to those businesses	5 Years
C8. Increase the number of solar-ready buildings in commercial, industrial, and institutional new construction	● Launch a platform to share best practices, as well as promote the City's Net Zero Energy Building Guide and Solar-Ready Guide ● Explore policy options to increase solar-ready design in Eau Claire projects ● Conduct pilot to prioritize permitting process for solar ready buildings	5 Years
C9. Increase number of commercial subscribers to utility renewable subscription programs	● Conduct outreach and promote sign-ups via the City of Eau Claire and utilities. ● Include renewable subscriptions in annual recognition awards by City	3 Years
C10. Increase adoption of renewable-powered heating, cooling, and hot water technologies, including geothermal projects	● Explore city policies for renewable thermal financial incentives ● Conduct feasibility study to identify leading sectors and opportunities for waste heat use within Eau Claire ● Include information on geothermal projects for new construction projects	8 Years

Transportation Sector

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
T1. Densify the city	● Calculate density baselines city-wide, in census tracks, and in opportunity areas ● Determine impacts and density goals ● Adjust Comprehensive Plan map and policies	1–2 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
	● Adjust zoning, development review, and transportation demand-centered management and reduction measures	
T2. Incentivize and require more compact and mixed-use development	● Use Traditional Neighborhood Development ordinance ● Require compact and mixed-used development when using TIF funds ● Research other zoning innovations such as form-based codes ● Amend the City's zoning ordinance to adopt form-based codes or hybrid version ● Explore the "EcoBlock" concept for local replication opportunities	5 Years
T3. Reduce required parking	● Study parking reduction strategies ● Recommended changes ● Pass ordinance changes	5 Years
T4. Increase the City's bike and pedestrian friendly environments	● Implement and fund capital projects in the City Bicycle and Pedestrian Plan ● Pass a Complete Streets policy	1–2 Years
T5. Increase neighborhood walkability	● Collaborate with experts on designing walkable cities ● Implement and fund capital projects in the City Bicycle and Pedestrian Plan ● Use WalkScore.com to measure, monitor, and improve neighborhood and city walkability	5 Years
T6. Launch bike- and scooter-share programs	● Community partnerships formed to promote programs ● Pass a scooter-share enabling ordinance ● At least one bike- or scooter-share company enters the market	1–2 Years
T7. Improve transit ridership and access	● Explore strategies to attract greater ridership ● Investigate service improvements in the Transit Development Plan (TDP) ● Implement TDP recommendations ● Research and apply for available grants ● Support Regional Transit Authorities (RTAs)	1–2 Years
T8. Explore on-demand micro-transit	● Follow micro-transit recommendations in the TDP ● Perform cost–benefit analysis on concept (include EVs) ● Explore any public or private partnerships ● Pilot coverage area	5 Years
T9. Explore a zero-fare transit system	● Study impact on budget and ridership ● Explore options for revenue sources ● Implement system changes	10 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
	● Measure VMT reductions	
T10. Implement electric vehicle roadmap	● Implement recommendations of plan ● Support policies and efforts for marketplace transformation	1–2 Years
T11. Conduct broad community outreach on electric and alternative fuel vehicles	● Work with utilities and partners to hold education and marketing events (ride & drives) ● Develop a website page for EV information	1–2 Years
T12. Increase local purchases of electric vehicles	● Provide dealerships with relevant EV customer information ● Encourage partnership between utilities and car dealerships	1–2 Years
T13. Foster EV car- or ride-sharing and taxi programs	● Research model practices (e.g., HourCar mobility-hubs in the Twin Cities) ● Explore or form public and private partnerships ● Explore incentives for fuel-switching with companies serving the community	5 Years
T14. Expand electric light duty vehicle charging infrastructure	● Follow strategies in the EV Roadmap ● Continue to work with utilities providers ● Apply for EV charging infrastructure grants ● Install public and private chargers	1–2 Years
T15. Work with utility providers to promote charging infrastructure and competitive rates	● Support and promote utility charging rates ● Work with utilities to provide information to residents and businesses on charging options	1–2 Years
T16. Require and prioritize parking for electric vehicles	● Research EV siting and zoning best practices ● Pass priority EV parking, enforcement and EV-ready requirements	5 Years
T17. Promote aviation carbon offset investing	● Promote awareness of programs ● Track offsets at Chippewa Valley Regional Airport	1-2 Years

Waste Sector

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
W1. Use 100% of wastewater treatment plant biogas	● Asses the project economics ● Investigate options for EV charging ● Secure capital funding	5 Years
W2. Continue land application of bio-solids	● Secure additional fields ● Investigate vehicle spreader options to increase capacity	5 Years
W3. Establish a zero refrigeration leak goal	● Pass a zero refrigerant leak resolution ● Create a network and list of companies	10 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
	● Publicly recognize companies	
W4. Transition haulers to capture compostables	● Educate public ● Partner with local haulers and business ● Study impacts and options for curbside and community compost sites ● Launch a program	1–2 Years
W5. Increase recycling of construction and demolition (C&D) materials	● Publicize where recycled C&D materials go ● Partner with haulers and construction firms ● Launch an effective recovery program	10 Years
W6. Explore organized municipal waste collection	● Study the costs and benefits of transitioning to an organized system ● Engage haulers on recommendations ● Survey public and hold community meetings ● Potentially pilot recommendations ● If successful, enact organized waste ordinance	10 Years
W7. Explore building a Materials Recovery Facility	● Develop a stakeholder feasibility working group ● Study the costs and benefits ● Develop business plan ● Secure local and other end-markets ● Secure facility funding	5 Years

Cross Cutting Strategies

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
CC1. Continue to support utilities' carbon-free and renewable energy goals	● Support utilities' integrated resource plans that demonstrate climate change commitments ● Advocate legislatively on areas of mutual interest ● Monitor yearly carbon grid intensity factor reductions for utility and city progress	1–2 Years
CC2. Continue to support a social cost of carbon in climate and energy policy	● Advocate for representatives of Congress to pass a marketplace solution to address the external costs of carbon pollution ● Investigate a social cost of carbon and internal cost shadow in making purchases	1–2 Years
CC3. Create a public outreach campaign	● Create a communications and marketing plan ● Determine implementation priorities and projects ● Work with partners and media outlets ● Leverage annual City sustainability awards	1–2 Years

STRATEGY	MAJOR MILESTONES	UNDERWAY WITHIN
CC4. Provide implementation budget support	- Allocate funds to use for program marketing, outreach activities, projects, and programs - Identify specific funding requests during development of annual work plans - Work with partners to seek grants, matching dollars, or sponsorships	1–2 Years
CC5. Form a local partnership collaborative	- Invite stakeholders to a listening roundtable - Identify areas of mutual concern or shared projects - Develop a formal partnership collaborative - Allocate human and fiscal resources	5 Years
CC6. Work with local institutions to train the next generation of the environmental workforce	- Support and partner with CVTC, which has a solar corps training program - Inventory local green job employers - Conduct interviews with local employers to understand current and future workforce gaps - Work with partners organizations to host a green jobs networking event	1–2 Years
CC7. Continue to use partnerships and tools to track required data	- Maintain City internship for data analysis - Use ClearPath Software for carbon inventories and goal tracking - Utilities provide energy reports, including net-metered renewable generation and other data improvements	1–2 Years
CC8. Transition to real-time or time-of-use energy billing for all customers	- Support utility deployment of smart meters - Seeks ways to integrate local programs into apps that work with smart meters - Seek ways to develop smart city networks with fiber capabilities	5 years
CC9. Hire additional City staff to work on achieving the plans, strategies and goals	- Define the need - Receive budget approval for staff	1–2 Years
CC10. Improve development review staff reports	- Determine important review criteria - Develop scoresheet or calculators - Share resources publicly - Implement during development plan review	1-2 Years

APPENDIX A: DETAILED NEAR-TERM STRATEGIES AND TACTICS

This appendix contains additional detail on the strategies included in this plan, including tactics identified by the Steering Committee.

Biodiversity

Baseline Activity in 2018: The city limits tree canopy covers 24% of land (2013) and sequesters 12,725 $MTCO_2e$ or 1.4% of total emissions.

Proposed 2030 Targets: Protect and enhance the urban forest by increasing tree carbon sequestration by 5% per year (636 $MTCO_2e$) for 20 years over the 2013 baseline.

B1. Continue to implement policies, programs and projects as found in the City's official plans

Target Audiences: City

Policy & Planning

- Continue to implement in City's work plan the policies, programs, and projects found in the Comprehensive Plan, Multi-Hazards Mitigation Plan, etc.
- Support and collaborate with Eau Claire County land conservation and stewardship plans
- Revise plans when needed and maintain consistency with the REAP plan
- Continue in programs such as Tree City USA®, Bird City Wisconsin, etc.

B2. Create a Biodiversity Index

Target Audiences: City and county governments and partners

Support & Partnerships

- Work with area partners like DNR, County, Beaver Creek Nature Reserve, Gaylord Nelson Audubon Society, Northwestern Wisconsin Chapter, UWEC, CVTC, school district, ICLEI Cities Biodiversity Center, etc., to assess and profile the biodiversity resources, ecological needs, and values of the community[32]
- Seeking funding sources via partnerships or grants
- Hold public promotional event(s) to raise awareness and find additional partners
- Consider creating a local biodiversity network or council, or partner with existing committees

Education & Engagement

- Use art to engage and collaborative meetings to identify field resources

---

[32] Biodiversity Index at https://www.kingcounty.gov/services/environment/animals-and-plants/biodiversity/king-county-biodiversity-report.aspx

- Create a walking guide, mobile app or school research curriculum that features the index's flora and fauna and provides the ability to record or upload field observations

Policy & Planning

- Create the index and map resources for climate integration, planning, goals, monitoring, habitat adaptation and resiliency
- Consider creating biodiversity guidelines or local biodiversity strategy action plan for planning and policy work
- Improve carbon offsetting measurement of trees and other biodiversity resources
- Consider zoning or ordinance changes to implement the index and or plan

B3. Reduce sprawl, loss of biomass carbon sinks

Target Audiences: City and county governments and partners

Support & Partnerships

- Support recommendations in the Land Stewardship 2150: Eau Claire County plan[33]
- Build a movement and organize core city property owners by showcasing the positive impacts of density and the negative impacts of sprawl
- Include supporting data on how sprawl pushes development to surrounding towns, loss of tax base, and increases costs of building and maintaining infrastructure (roads, sewers, etc.)

Policy & Planning

- Explore incentivizing public transit and disincentivize development sprawl
- Modify zoning code to encourage density
- City acquire land to safeguard resources
- Create natural greenway buffers, belts and corridors using public and private lands
- Promote mixed use in developed and developing neighborhoods

B4. Maintain and increase urban forestation

Target Audience: City Forestry Department, developers

Policy & Planning

- Expand and preserve a diverse urban tree canopy
- Use marginal lands such as in City parks or private parking lots for reducing urban heat island effect and to maximize carbon sequestration
- Identify areas to plant fast-growing and resilient trees
- Continue to implement the City's street tree requirements
- Consider enhanced tree planting requirements for any new eco-development business park
- Recognition businesses that plant extra trees

---

[33] https://www.co.eau-claire.wi.us/departments/departments-l-z/planning-development/land-conservation-division/land-stewardship

- Coordinate tree and or native grass pollinator plantings with solar PV siting

Activity & Projects

- Mass planting on Arbor Day

B5. Retain, restore, and enhance natural spaces

Target Audience: City, developers, private property owners

Policy & Planning

- Promote an ecosystem design approach and other holistic landscape management approaches
- Revegetate places of opportunity such as rip-rap river banks, transitional areas and open spaces
- Use conservancy or public zoning when necessary to protect critical biodiversity
- Consider a tree preservation ordinance and incentive for saving trees
- Continue to enforce steep slope (20%) provisions through the DNR and MPO

Education & Engagement

- Education campaign to replace invasive species, with a particular focus on the jumping worm
- Evaluate certification as a Bee City USA
- Work with County and DNR to more broadly publicize annual native tree and plant sale
- Research and promote ways for invasive controls without herbicides and pesticides

Activity & Projects

- Annual invasive species cleanup to preserve the tree canopy
- Develop a biodiversity therapeutic or sensory landscape garden for all people

B6. Require more natural space for new development

Target Audience: Real estate developers

Activity & Projects

- Create a calculator tool that demonstrates pre-development carbon values vs. proposed post-development values to determine what mitigation strategies must be taken to align with 2050 goals; incorporate this tool into the City's development review process

Policy & Planning

- Establish carbon sink preservation requirements for new development
- Use the City's Planned Development Ordinance to cluster development so that natural features are preserved and accommodate for loss of natural carbon sequestration sinks by enhancing the built environment such as with lawn landscaping amenities or additional tree plantings
- Center new developments on walkable greenspaces or trail corridors rather than auto-centric street fronts[34]

---

[34] University of California Davis West Village at https://www.ucdavis.edu/news/zero-net-energy

- For site and building design, use net-zero guide and consider biophilic strategies that work with the site and micro-climate[35]

Education & Engagement

- Promote education opportunities to enrich the carbon level in soil

B7. Increase use of trails as biodiversity corridors

Target Audiences: City and county governments

Policy & Planning

- Leverage waterways, trail corridors, marginal right-of-way lands, etc. for preservation and carbon sequestration opportunities
- Analyze trails for improvements
- Determine funding and operational needs

Activity & Projects

- Increase plantings per recommendations
- Include trees in new riverwalk trails and all new park trails

B8. Ease barriers to increase alternative lawns

Target Audience: City, general public

Support & Partnerships

- Partner with UW–Extension Agriculture, Master Gardeners, and Youth groups to promote sustainable landscaping and urban agriculture in the city
- Encourage neighborhood association and businesses to support alternative lawns

Education & Engagement

- Campaign to change the cultural preferences by showing what a yard that isn't all green grass can look like (promotes also carbon capture and soil enrichment)
- Demonstrate alternative landscaping through pilot sites (e.g., parking lot islands)
- Promote education about lawnmowers as a source of pollution and promote alternatives to gas-powered lawnmowers including alternative lawns, as well as electric and push mowers

Policy & Planning

- Amend the ordinance to eliminate the required permit

B9. Increase on-site filtration and storm water capture

Target Audience: City, general public, builders

---

[35] Bosco Verticale apartments, Milan, Italy at https://en.wikipedia.org/wiki/Bosco_Verticale

Policy & Planning

- Continue to implement the City's storm water policy and meet DNR suspended total solids requirements and consider enhancements
- Consider a green infrastructure ordinance
- Collect data on runoff using real-time monitoring of storm water runoff in priority areas
- Continue erosion control policies, permitting and best practices
- Protect wetlands for water purification and biodiversity habitat

B10. Increase safe use of grey water

Target Audience: State

Policy & Planning

- Support modification to state code to allow for grey water use

B11. Reduce herbicides, pesticides, and fertilizers

Target Audiences: City and general public

Policy & Planning

- Model runoff from priority watersheds to determine inputs
- Implement stronger regulations and fines, if allowed by State
- Allow community composting (with restrictions) in community gardens

Education & Engagement

- Reuse composting for soil amendments at home
- Measure and publicize pesticide and fertilizer residues entering the Chippewa River at different neighborhood sites

B12. Support local food and local producers & farmers

Target Audience: General public

Support & Partnerships

- Continue to provide public and private venues to sell local food
  - o Continue to financially support the FoodShare Market Match program at Downtown Farmers Market
- Support urban agriculture policies and practices to reduce strain on large agriculture that create major emissions
- Partner with farms to support no-till and cover cropping techniques
- Attract urban agriculture businesses to Eau Claire and pair with year-round Farmers Market in an indoor space
- Recruit restaurants or growers that have hydroponic food production year-round

- Develop community gardens and youth education programs
- Promote available resources like the Farm Fresh Atlas[36]
- Promote the local food benefit of economic development

Residential Sector

Overarching Strategies

R1. Increase prevalence of energy-efficient, low-emissions affordable housing

- Partner with the City's Housing Opportunities Commission and the Regional Housing Task Force
- Partner with affordable housing developers such as Habitat for Humanity, etc.
- Partner with and leverage Western Dairyland and Focus on Energy resources
- Provide information on the cost-saving benefits from energy efficiency and solar

R2. Promote the use of the City's Net Zero Energy Building Guide.

- Deploy trainings and communications to increase awareness and implementation of net-zero energy strategies as found in the guide
- Provide guide to local home shows or remodeler showcase events
- Coordinate with education opportunities such as a demonstration home with Chippewa Valley Technical College

R3. Support a residential net-zero energy development

- Partner with stakeholders to research the concept for buy-in
- Develop the vision and steps needed for approval
- If necessary, acquire land or use existing excess land owned with Xcel Energy such as in Gateway Business Park
- Seek via RFI or RFPs interested developers and builders who fit the vision
- Develop a residential housing arrangement or subdivision that is energy self-sufficient (i.e., designed using energy efficiency; passive energy; solar and storage; smart appliances, meter, and grid technologies; etc.)

Energy Efficiency

Baseline Activity in 2018: 1.5% electricity savings and 0.9% natural gas savings annually.

Proposed 2030 Targets: 2% electricity savings and 1.4% natural gas savings annually.

---

[36] Farm Fresh Atlas at https://farmfreshatlas.org/

R4. Increase awareness of energy efficiency among Eau Claire residents

Target Audiences: All households with a focus on older homes; contractors

Education & Engagement

- Launch a campaign to celebrate low-carbon and -energy lifestyle leaders in the community; consider highlighting leaders in the "Parade of Homes" event
- Include easy energy savings tips in City communications (e.g., turn off lights and unplug inactive electric devices)
- Work with Focus on Energy to distribute information on home energy loss, including the financial benefits of insulation, programmable thermostats, and efficient lighting; target homes in Eau Claire's older neighborhoods
- Explore and promote additional resources including the Green Building Advisor
- Partner with community organizations to host workshops for residents and contractors on relevant and popular topics, including "Ice Dams and Icicles" explaining energy efficiency solutions to common household issues
- Work with utilities to sign up Eau Claire residents for Xcel Energy's My Energy and Eau Claire Electric Cooperative's Smart Hub programs to track energy use

Activities & Projects

- Work with construction classes at Chippewa Valley Technical College to build a demonstration net-zero residential home open to the public

Support & Partnerships

- Work with local neighborhoods, businesses, and institutions to launch a new eco-teams/low carbon diet program, including contests for energy or carbon savings

R5. Promote Energy Audits, Energy Efficiency Rebates, and Financial Incentives

Target Audiences: Homeowners, landlords, renters, students

Education & Engagement

- Host information on the City website about home energy improvement options, including available energy efficiency programs and where to purchase ENERGY STAR appliances
- Educational campaign to encourage residents to sign up for demand-response programs from their utility
- Assemble a group of volunteers to promote energy efficiency options at local events through tabling; collaborate with Focus on Energy and Xcel Energy to support tabling efforts and provide materials
  - o Explore event opportunities such as Farmers Market and events like the Solar Power Hours hosted by MREA
- Continue to promote Property Assessed Clean Energy for qualifying multi-family residential

- Promote the use of the Net Zero Energy Building Guide, HERS rated energy efficient homes, LEED for Homes, and Focus on Energy's New Home Certification programs

Policy & Planning

- Establish a City fund to buy down the cost of home energy efficiency measures for residents, especially for low-income residents.
- Provide additional financial support from the City to accelerate use of these existing programs for older homes (similar to La Crosse's Mayor's Home Energy Challenge)
- Explore and promote City financial incentives for residents participating in energy programs, including reduced property taxes
- Consider working with the state to establish residential PACE in Wisconsin and Eau Claire

Activities & Projects

- Host clinics to help residents complete rebate paperwork or purchase discounted efficiency products online
- Partner with UWEC Student and Community Outreach on Residential Efficiency (SCORE) to provide energy-efficient, cost-saving bulbs and appliances for qualified student renters

Support & Partnerships

- Facilitate coordination between agencies and organizations that offer programs locally, such as Focus on Energy and Western Dairyland
- Partner with local community organizations serving under-resourced households to promote and support energy audits for low-income residents

R6. Pass a Home Energy Rating Ordinance

Target Audiences: Developers, builders, realtors, homeowners, landlords

Policy & Planning

- Explore feasibility for a local energy rating disclosure policy for Eau Claire homes
- Explore policy examples from other cities, including Minneapolis and Portland
- Promote housing affordability and renewable energy as part of the disclosure
- Consider using existing rating programs such as the Home Energy Rating System (HERS)
- Highlight landlords or management companies with energy-efficient rentals

Renewables

Baseline Activity in 2018: There were 1,310 total renewable subscribers in 2018 (Windsource + solar gardens); 12 new renewable sign-ups in 2018 through Focus on Energy.

Proposed 2030 Target: Convert 200 residential households per year to all renewable electricity, and 20 households per year to renewable thermal (including geothermal HVAC and solar thermal).

R7. Increase number of residential subscribers to utility renewable subscription programs (e.g., Renewable*Connect or Evergreen)

Target Audience: All households in Eau Claire

Education & Engagement

- Produce outreach materials co-branded between the City and utilities
- Promote sign-ups from community leaders and local celebrities
- Generate coverage of program options in local media

Activities & Projects

- Design city-wide challenge for residents to subscribe 100% to renewable energy

Support & Partnerships

- Work with local nonprofits, churches, and advocacy groups to conduct outreach, including door-to-door outreach.

R8. Increase privately owned solar

Target Audience: General public

Activities & Projects

- Educate public about solar and leverage the City's Solsmart Gold designation and website resources
- Promote solar using the City's Solar-ready guide and PV calculators
- Keep permit fees low and zoning favorable
- Offer a local solar tour of homes and or businesses
- Permit 50 new systems per year

R9. Develop new community-sited solar within Eau Claire and offer subscriptions to residents

Target Audience: General public

Activities & Projects

- Identify possible municipal site locations within the City of Eau Claire
- Work with Xcel Energy and Eau Claire Energy Cooperative (ECEC) and developers to develop sites
- Reserve a percentage of subscriptions for income-qualified residents for a set amount of time or until filled

Support & Partnerships

- Facilitate a working group of potential project partners such as Eau Claire County, Xcel Energy, ECEC, and the University of Wisconsin Eau Claire to increase feasibility and coordination opportunities

R10. Support a solar group-buy program in the Eau Claire area

Target Audience: All households in Eau Claire

Education & Engagement

- Evaluate lessons learned from previous two group buys (e.g., Solarize Eau Claire[37]) to apply to future projects
- Lead campaign to educate residents about solar group buys

Support & Partnerships

- Partner with local solar installers to provide program input
- Engage local advocacy groups to set standards for solar group buy

R11. Increase the number of solar-ready buildings in residential new construction

Target Audiences: Builders and construction companies

Education & Engagement

- Compile list of resources available to help homeowners install renewable energy and energy storage in their homes, including financing, grants, and local funding to mitigate costs
- Promote the City's Net Zero Energy Guide, Solar-Ready guide, and PV calculator tools
- Highlight rental properties that are using solar energy

Support & Partnerships

- Identify home builders with leading performance in the solar ready market
- Engage construction companies in the process of drafting solar-ready requirements

Policy & Planning

- Explore including sustainable building requirements when projects receive City financing (e.g., Tax Increment Financing)
- Work at the state level to advocate for changes to local building codes to increase solar-ready buildings
- If allowed by state law, pass a building code requiring solar ready buildings by 2022

---

[37] Local 2019 solar group-buy program, ran by the Midwest Renewable Energy Association

R12. Increase adoption of renewable-powered heating, cooling, and hot water technologies, including geothermal and air source heat pump projects

Target Audiences: Residential new construction and retrofit projects

Education & Engagement

- Develop technical materials about the benefits of geothermal and other renewable-powered heating, cooling, and hot water options
- Include relevant information as part of new homeowner's packet
- Promote Focus on Energy heat pump rebates for electric heat customers, coupled with renewable subscription options
- Promote Property Assessed Clean Energy (PACE) financing for multifamily residential
- Use the Net Zero Energy Building Guide and information from the Geothermal Association to share best practices for new construction on urban lots

Support & Partnerships

- Engage with local contractors on technologies and options for renewable heat, including how to overcome potential barriers

Activities & Projects

- Conduct a feasibility study to evaluate the potential for renewable-powered heating, cooling, and hot water in Eau Claire, potentially in partnership with the University
- Identify the feasibility and potential public–private partnership opportunities for a geothermal district heating system demonstration project
- Utilities to provide incentives for systems such as Eau Claire Energy Cooperative's geothermal rebate

Commercial, Industrial, and Institutional Buildings

Overarching Strategies

C1. Promote the use of the City's Net Zero Energy Building Guide

- Deploy trainings and communications to increase awareness and implementation of net-zero strategies as found in the guide
- Develop scoresheet or use existing resources to help calculate achieving net-zero energy

C2. Support a business recognition program to recognize and promote businesses that have taken action in sustainability, especially relating to energy

Education & Engagement

- Publish and celebrate a "Best Practice Renewable Businesses" list annually of local business that achieve certain eco-friendly milestones; explore working with the Chamber of Commerce's Green Business Program
- Create a series of monthly business-specific outreach meetings (breakfasts or lunches) to inform businesses about and promote various initiatives, including utility renewable energy programs
- Through this program, promote holistic models of eco-development in new construction and major renovations

Support & Partnerships

- Determine structure of the recognition program and how it relates to existing programs such as LEED, ENERGY STAR, and others
- Determine criteria for program based on the goals of this plan and create information for businesses hoping to be recognized
- Work with local partners, including the Eau Claire Area Chamber of Commerce, to support a sustainable business recognition program

C3. Offer and promote resources to reduce the costs of energy efficiency and renewable energy projects, including financing

Education & Engagement

- Promote the financing resources that exist for Eau Claire businesses, including commercial and industrial Property Assessed Clean Energy (PACE)
- Promote existing financial support and resources that exist for energy efficiency and renewable energy projects, including rebates from Focus on Energy and tax incentives

Policy & Planning

- Explore options of the City offering low-cost loans for energy efficiency and renewable energy projects for local businesses and institutions
- Explore feasibility of City property tax reduction benefits for energy efficiency
- Explore models to use City funding to buy down interest rates on energy efficiency and renewable energy projects
- Explore the feasibility of launching a revolving fund for energy efficiency projects

Energy Efficiency

Baseline Activity in 2018: Annual savings of 2.3% for electricity, and 1% for natural gas.

Proposed 2030 Targets: Achieve 3% energy savings per year in electricity and 1.5% savings per year in natural gas.

C4. Improve energy efficiency in existing buildings and infrastructure

Target Audiences: Existing businesses and institutions

Education & Engagement

- Show community success stories of energy efficiency with credible testimonials or case studies, published through City and local business channels and showcased at breakfast or lunch series for businesses; explore partnering with the local Chamber of Commerce to promote success stories and case studies
- Track progress toward community wide energy savings goal in a publicly visible way
- Conduct targeted outreach to largest consumers
- Launch an awareness campaign targeted at building managers outlining how to do building recommissioning to establish awareness of HVAC commissioning as low-cost energy efficiency action;[38] target campaigns during the beginning of heating and cooling seasons
- Promote existing Focus on Energy and Xcel Energy programs, with a focus on audit programs that support project implementation
- Promote Xcel Energy's and Focus on Energy's Mid-Market Programs
- Develop and promote targeted information for hospitality, health care, and education sectors on ENERGY STAR equipment return on investment, incentives, and financing options
- Recommend best products for Eau Claire's climate (e.g., air source heat pumps for furnaces and hybrid water heaters that are either split fuel or fully electric)
- Promote trade partners that sell or install ENERGY STAR-rated products

Support & Partnerships

- Partner with Chippewa Valley Technical College, Xcel Energy, Focus on Energy, and others to reduce the cost of service through rebates and technical assistance

Activities & Projects

- Create or promote existing simple cost-savings calculator to show company return on investment from energy efficiency
- Require ENERGY STAR purchases by the City as an example and explore ways to share experience with others
- Convert City streetlights to LEDs

C5. Improve energy efficiency in new construction and major renovations

Target Audiences: Developers, large businesses, institutions

Education & Engagement

- Distribute information promoting LEED, WELL™, or other certification programs for building renovations through the City's permitting process
    - Develop informational materials on LEED and net zero energy

---

[38] A recommissioning study seeks to improve the efficiency of existing building operations by identifying and tuning up less-than-optimal equipment within a facility. Source xcelenergy.com

- o Consult with LEED and net zero energy professionals on best practices of building design and retrofitting and share those with local developers
- o Work with businesses or local colleges to establish educational and research teams or businesses to analyze and present proposals for current best practices in goods processing and manufacturing
- Promote the City's Net Zero Energy Building Guide

Policy & Planning

- Designate "green zones" of residential and commercial development where, for example, buildings are held to certain building efficiency standards as allowed by state law
- Explore policy options to integrate energy efficiency into project approval process for new construction and major renovation, especially in cases where the developer requests a change in zoning or receives public funding
- Explore options to reduce permitting fees for projects that qualify for recognition in green certification programs

C6. Increase the number of businesses that track energy use through energy benchmarking

Target Audiences: Businesses over 10,000 square feet

Education & Engagement

- Promote Xcel Energy's benchmarking data transfer tool for automated energy use updates in ENERGY STAR Portfolio Manager
- Benchmark and share municipal building energy use to lead by example
- Encourage buildings to share results publicly as part of leader recognition and case studies

Policy & Planning

- Explore city energy and water benchmarking policy options

Renewables

Baseline Activity in 2018: There were 14 renewable subscribers in 2018 (Windsource® + solar gardens) in Eau Claire; two new renewable sign-ups in 2018 through Focus on Energy.

Proposed 2030 Targets: 15 new renewable electric customers per year to reach a total of 5 MW by 2030; five new renewable thermal customers per year.

C7. Increase the number of on-site customer-owned solar photovoltaic installations at existing buildings and sites

Target Audiences: Businesses and institutions, especially those with large parking lots or large flat roofs

Education & Engagement

- Provide a renewable energy resource center with connections and information for local businesses, including:
    - Connecting solar installation contractors with local businesses
    - Promoting existing tools that assess solar rooftop potential[39]
- Create a targeted campaign to encourage companies with large rooftop spaces or parking lots to install solar

Policy & Planning

- Evaluate financial benefits such as tax incentives or cost reductions in the permitting process for businesses that install on-site renewable energy

Activity & Projects

- Identify and study potential project location sites (i.e., businesses with large parking lots or rooftop space) and conduct target outreach to those businesses, providing resources
- Promote a solar group buy for small commercial businesses
- Work with Xcel Energy to investigate a community solar farm for large users to help meet their shared sustainability goals
- Work with businesses and developers to encourage the installation of solar arrays for clusters of businesses (e.g., downtown block, shopping mall)
- Work with artist communities to create beautiful and creative solar panel design for public spaces
- Use City and other local communication channels to publicize existing solar installations, including city-owned solar installations once completed

C8. Increase the number of solar-ready buildings in commercial, industrial, and institutional new construction

Target Audiences: Businesses, institutions, and real estate developers

Education & Engagement

- Introduce a platform for sharing best practices on solar readiness targeted towards Eau Claire developers
- Promote City's Net Zero Energy Building Guide and Solar-Ready Guide to plan for installations

---

[39] NREL's PV Watts, Google Project Sunroof, or Rocky Mountain Institute's solar calculator

Policy & Planning

- Explore policy options to increase solar-ready design in Eau Claire projects, including the following:
  - Working at the state level to advocate for changes to local building codes to incentivize solar ready buildings
  - If allowed by state law, establishing citywide ordinances or permitting incentives
  - Explore including sustainable building requirements including solar-ready infrastructure when projects receive city financing (e.g., TIF)
  - Prioritize permitting processes to fast track or give preference to solar-ready projects

C9. Increase number of commercial subscribers to utility renewable subscription programs (e.g., Renewable*Connect or Evergreen)

Target Audience: All commercial customers

Education & Engagement

- Conduct outreach and promote sign-ups via the City of Eau Claire and utilities
  - Design messaging to include emphasis on subscriptions as a no-hassle way to go 100% renewable, with no requirements and no renovations
- Identify and offer resources to help businesses navigate costs, benefits, and regulations

Policy & Planning

- Explore incentives provided by utilities or government to buy down higher subscription costs
- Include renewable subscriptions in annual recognition awards by City

C10. Increase adoption of renewable-powered heating, cooling, and hot water technologies, including geothermal projects

Target Audience: Commercial, industrial, and institutional buildings

Policy & Planning

- Explore city policies for renewable thermal financial incentives
- Explore providing an incremental startup or other incentive reduce impact of high installation costs

Activities & Projects

- Explore feasibility and leading opportunities for waste heat use for thermal loads within Eau Claire
- Work with organizations such as the Chamber of Commerce and Focus on Energy to identify target users where this technology is the most effective
- Include information on geothermal projects for new construction projects

Transportation

Baseline Activity in 2018: Total community vehicle miles travel (VMT) totaled 728,824,567 with about 92% of those miles coming from gasoline-fueled vehicles.

Proposed 2030 Targets: Electric vehicles increase to 10% of VMT and an increase in vehicle occupancy from the Midwest average of 1.63 persons per vehicle to 2.

Land Use

T1. Densify the city

Target Audiences: Developers

Policy & Planning

- Calculate density baselines city-wide, in census tracks/block groups, and in opportunity areas
- Abate unintended consequences such as biodiversity loss and urban heat island effect
- Determine impacts and density goals
- Adjust Comprehensive Plan map and policies
- Adjust zoning, development review, and transportation demand-centered management and reduction measures

T2. Incentivize more compact and mixed-use development

Target Audiences: Developers

Policy & Planning

- Promote the use of the City's Traditional Neighborhood District ordinance
- Require compact and mixed-used development when using TIF funds
- Research other zoning innovations such as form-based codes
- Amend the City's zoning ordinance to adopt form-based codes or hybrid version
- Continue to enforce the City's extraterritorial review area to limit sprawl
- Consider establishing "infrastructure fees" for development outside of existing roads and utilities
- Promote density bonuses for developers

Support & Partnerships

- Work with adjacent towns on cooperative boundary planning
- Explore partnerships to create a renewable smart-home development
- Grid integration opportunities such as the Oakland, CA, "EcoBlock" pilot concept

T3. Reduce required parking

Target Audiences: Developers

Policy & Planning

- Coordinate approach with bike- and scooter-share strategy
- City passes reduction in number of parking spot requirements and creation of electric vehicle-ready requirements, works with developers, city council, and city staff
- Implement recommended changes of the City's parking study
- Study and promote transportation demand management strategies in key build-up areas (e.g., employment and housing concentrations) to encourage induced demand for alternative modes of transportation

Alternative modes of transportation

T4. Increase the City's bike- and pedestrian-friendly environments

Target Audience: City

Policy & Planning

- Continue to implement the recommendations of the City's Bike and Pedestrian Plan
- Pass a "Complete Streets" resolution with green infrastructure accommodations
- By 2030 achieve gold designation under the League of American Bicyclists Bicycle Friendly Community Program

T5. Increase neighborhood walkability

Target Audiences: General public

Policy & Planning

- Consider collaborating with Walkable city planning expert
- Implement and fund capital projects in the City's Bike and Pedestrian plan, Safe Routes to School Plan, Safe Routes to Parks, Regional Bike Plan, and Comprehensive Plan with its trail network build-out
- Integrate in new neighborhoods
- Continue to implement sidewalk gap closures within the neighborhoods identified in the Bike and Pedestrian Plan

Education & Engagement

- Promote the "walk score" website

Activity & Projects

- Pilot "Open Street" days in downtown Eau Claire to create pedestrian-only temporary zones
- Use signage to highlight walkable neighborhoods and business districts
- Commission local artists to highlight walkable neighborhoods and business districts using sidewalk or other forms of art

T6. Launch bike- and scooter-share programs

Target Audiences: General public

Policy & Planning

- Explore revisions to the City bicycle sharing ordinance to include scooters
- Leverage the health care providers in Eau Claire to sponsor program

Support & Partnerships

- Partner with UWEC, health care, business, and others to help implement the program

T7. Improve transit services and access

Target Audiences: General public

Policy & Planning

- Investigate service improvements in the Transit Development Plan (TDP), including daily service (i.e., Sundays), adjusting start and end times, greater frequency on certain fixed routes, on-demand EV mobility ("micro-transit"), and reducing last-mile barriers
- Explore partnering with ride-share companies active in Eau Claire to offer free or discounted rides to income-qualified residents
- Advocate for Regional Transit Authorities (RTAs) to support improved service

Activity & Projects

- Design new transit center to incorporate flexible transit options (i.e., EV buses and on-demand mobility) along with installing on-site renewables
- Continue to research and apply for available grants for innovative transit projects which align with the 2050 goals

Support & Partnerships

- Explore partnerships with ride-share entities that offer EVs

T8. Explore on-demand micro-transit

Target Audience: City

Policy & Planning

- Follow micro-transit recommendations in the TDP
- Perform cost–benefit analysis on concept (include EVs)

Activity & Projects

- Pilot coverage area

Support & Partnerships

- Explore any public and private partnerships

T9. Explore a zero-fare transit system

Target Audience: City

Policy & Planning

- Study impact on budget
- Explore options for revenue sources
- Implement system changes
- Measure VMT reductions

Alternative Fuel Vehicles

T10. Implement electric vehicle roadmap

Target Audiences: Community, municipality, utilities, and car dealers

Policy & Planning

- Implement recommendations of plan
- Support policies and efforts for marketplace transformation

T11. Conduct broad community outreach on electric and alternative fuel vehicles

Target Audiences: Community and car dealers

Education & Engagement

- Add charging station presence signs for off ramps and at local businesses
- Educate community on environmental and cost saving benefits of EVs
- Educate community on EV-ready housing, garages — separate educational initiatives for residents and businesses
- Educate on how to power EVs with more renewable energy or with renewable hydrogen
- Develop a website page for EV information
- Add a link to or embedded map highlighting public electric vehicle charging stations in Eau Claire to the City website

Support & Partnerships

- Work with utilities and partners to hold education and marketing events (ride & drives)
- Collaborate with Xcel, Eau Claire Energy Cooperative, CVTC, and UWEC
- Consider working with Visit Eau Claire to publicize charging stations

T12. Increase local purchases of electric vehicles

Target Audiences: Drivers and car dealers

Activity & Projects

- Encourage partnership between utilities and car dealerships

- Provide dealerships with relevant EV customer information
- Rebate incentives for electric vehicles sponsored by the local electric utilities

T13. Foster EV car- and ride-sharing and taxi programs

Target Audiences: Taxis, private sector and non-profits

Policy & Planning

- Follow models of best practices like Xcel Energy in Minneapolis (e.g., Hourcar®)
- Explore policies that support car-sharing
- Prioritize electric vehicles for pilot program
- Explore integrating car-sharing with a microgrid transit system and alternative modes of transportation including bicycles and scooters

Activity & Projects

- Pilot a car-sharing program in Eau Claire
- Private sector provides EV taxis

T14. Expand electric light duty vehicle charging infrastructure

Target Audiences: City, energy providers, business owners

Education & Engagement

- Provide information to homeowners about Level 2 charging options for homes, including promoting utility programs to reduce costs

Policy & Planning

- Develop EV roadmap with Xcel Energy's Partners in Energy and implement recommendations

Activity & Projects

- Apply for EV charging grants
- City invests Capital Improvement Plan funding to install public charging stations in public parking
- Work with partners in developing Level 2 and fast-charging opportunities in the city
- Consider purchasing electric or hybrid shuttle vans for Eau Claire Transit micro-transit

T15. Work with utility providers to promote charging infrastructure and competitive rates

Target Audiences: Xcel Energy and Eau Claire Energy Cooperative

Policy & Planning

- Support and promote utility charging rates
- Work with utilities to provide information to residents and businesses on charging options

T16. Require and prioritize parking for electric vehicles

Policy & Planning

- Research EV siting and zoning best practices
- Pass priority EV parking, enforcement, and EV-ready requirements

T17. Promote investing in carbon offsets for aviation

Education & Engagement

- Provide information to air travelers on how to offset their carbon emissions
- Partner with Chippewa Valley Regional Airport to promote programs and track number of offsets each year

Waste

Baseline Activity in 2018: Baseline from 2009 DNR state waste characterization study: Organics (23%) and Construction & Demolition (21%).

Proposed 2030 Targets: Divert 50% of organic waste and 50% of construction & demolition streams.

W1. Use 100% of wastewater treatment plant biogas

Target Audiences: City

Activity & Projects

- Assess the project economics
- Investigate options for EV charging
- Continue to capture methane and seek to capture excess
- City to invest in a biodigester

W2. Continue land application of bio-solids (natural fertilizers)

Target Audiences: City

Activity & Projects

- City invest in a holding tank and vehicle spreader options to increase capacity
- Increase customers for spreading sludge

Support & Partnerships

- Work with private farmers

W3. Establish a zero refrigeration leak goal

Target Audiences: Commercial and institutional enterprises

Policy & Planning

- Pass a zero refrigerant leak resolution
- Create a network and list of companies
- Publicly recognize companies
- Explore requiring chlorofluorocarbon refrigerant audits

W4. Transition haulers to capture compostables

Target Audiences: Waste haulers

Support & Partnerships

- Work with County and local waste businesses to develop mechanisms and programs to increase diversion rates

Policy & Planning

- Determine uses for the compost end product such as carbon and soil amendments
- Study impacts and options for curbside and community compost sites
- Explore creating an incentive for residents to compost
- Establish a solid waste diversion goal
- Launch a program

Education & Engagement

- Educate public about proper composting

W5. Increase recycling of construction and demolition materials

Target Audiences: Construction companies and waste haulers

Education & Engagement

- Educate and encourage private sector to recover at least 75% of waste stream
- Provide signage and protocols on how to keep the waste streams clean

Support & Partnerships

- Work with a material recovery center and haulers to increase rate in city
- Haulers to inform contractors to properly recover materials at construction sites

Activity & Projects

- Continue to recover materials at City projects per policy

W6. Initiate organized municipal waste collection

Target Audience: Waste haulers

Policy & Planning

- Study the costs and benefits of transitioning to an organized system

- Engage haulers on recommendations
- Survey public and hold community meetings
- Potentially pilot recommendations
- If successful, enact organized waste ordinance

W7. Explore building a Materials Recovery Facility

Target Audience: Waste companies

Activity & Projects

- Ensure that recyclables are being recycled
- Explore end markets for all materials

Support & Partnerships

- Work with Eau Claire County, Chippewa County and Dunn County's solid waste and recycling transfer system
- Develop a stakeholder feasibility working group

Policy & Planning

- Study the costs and benefits
- Develop business plan

Cross Cutting Strategies

CC1. Continue to support power utilities' carbon-free and renewable goals

Target Audience: Power utilities

Support & Partnerships

- Support utilities' integrated resource plans that demonstrate climate change commitments
- Advocate legislatively on areas of mutual interest and utilize Energy Future Collaborative
- Monitor yearly carbon grid intensity factor reductions for utility and city progress

CC2. Continue to support a social cost of carbon in climate and energy policy

Target Audience: Congress and City

Policy & Planning

- Advocate for representatives of congress to pass a marketplace solution to address the external costs of carbon pollution
- Investigate a social cost of carbon and internal cost shadow in making purchases
- Create calculators to demonstrate added costs
- Consider adding to sustainable purchasing policy

CC3. Create a public outreach campaign

Target Audiences: General public

Support & Partnerships

- Create a communications and marketing plan to address opportunities and barriers
- Determine REAP implementation priorities and projects
- Determine funding support
- Develop main logo, infographics, website and program support materials
- Work with partners and media outlets to deploy campaign to community
- Leverage annual City sustainability awards
- Monitor efforts for refinement or adjust offerings in future years

CC4. Provide implementation budget support

Target Audiences: City

Support & Partnerships

- Allocate funds to use for program marketing, outreach activities, projects and programs
- Identify specific funding requests during development of annual work plans
- Work with partners to seek grants, matching dollars or sponsorships

CC5. Form a local partnership collaborative

Target Audiences: Institutions, organizations, and business

Support & Partnerships

- Invite stakeholders to a listening roundtable
- Identify areas of mutual concern or shared projects
- Develop a formal partnership collaborative
- Allocate human and fiscal resources

CC6. Work with local institutions to train the next generation of the environmental workforce

Target Audience: Local educational institutions, youth, and young professionals

Education & Engagement

- Identify local institutions with an interest in supporting green job training (UWEC, CVTC, etc.)
- Support curriculum development
- Promote why these jobs matter due to climate change
- Support and partner with CVTC which has a solar corps training program in the next two years
- Inventory local green job employers
- Conduct interviews with local employers to understand current and future workforce gaps
- Work with partner organizations to host a green jobs networking event

CC7. Continue to use partnerships and tools to track required data

Target Audience: City

Support & Partnerships

- Continue to partner with local colleges to secure internship assistance
- Continue to request community energy reports from Xcel Energy and Eau Claire Energy Cooperative — see that reports provide customer total renewable energy generation
- Update carbon and renewable energy inventories and projections
- Maintain ClearPath membership and internal databases
- Track metrics and goals in the REAP plan
- Report progress and metrics in annual sustainability reports

CC8. Transition to real-time or time-of-use energy billing for all customers

Target Audience: Power utilities

Support & Partnerships

- Support utility deployment of smart meters
- Support rates that may shift electric demand to reduce costs to customers
- Support ways smart meters may facilitate greater renewable electricity integration
- Seeks ways to integrate local programs into apps that work with smart meters
- Seek ways to develop smart city networks with fiber capabilities

CC9. Hire additional city staff to work on achieving the plans strategy and goals

Target Audience: City

Support & Partnerships

- Add proposal to hire a full-time City staff to the City's budget
- Develop a work plan for staff based on the strategies and milestones of this plan

CC10. Improve development review staff reports

Target Audience: City

- Determine review criteria
- Develop tools such as a scoresheet or calculator to assist in review
- Share resources publicly to aid development community
- Determine results per application to assist decision-makers

APPENDIX B: KEY LONG-TERM INITIATIVES: 2030–2050

The 10-year strategies included in this plan will meet the City's interim carbon goal of a 30% reduction over 2015 levels by 2030. However, beyond that time period, more transformational changes will need to take place in order to reach carbon neutrality. These strategies include denser urban development and a significant reduction in transportation miles traveled, transitioning building energy use from natural gas to decarbonized electricity, and major reductions in waste.

While these strategies will not be complete within the next ten years, they are foundational activities that need to begin during this time period. The sections below introduce these transformational strategies and the building block activities needed to support them.
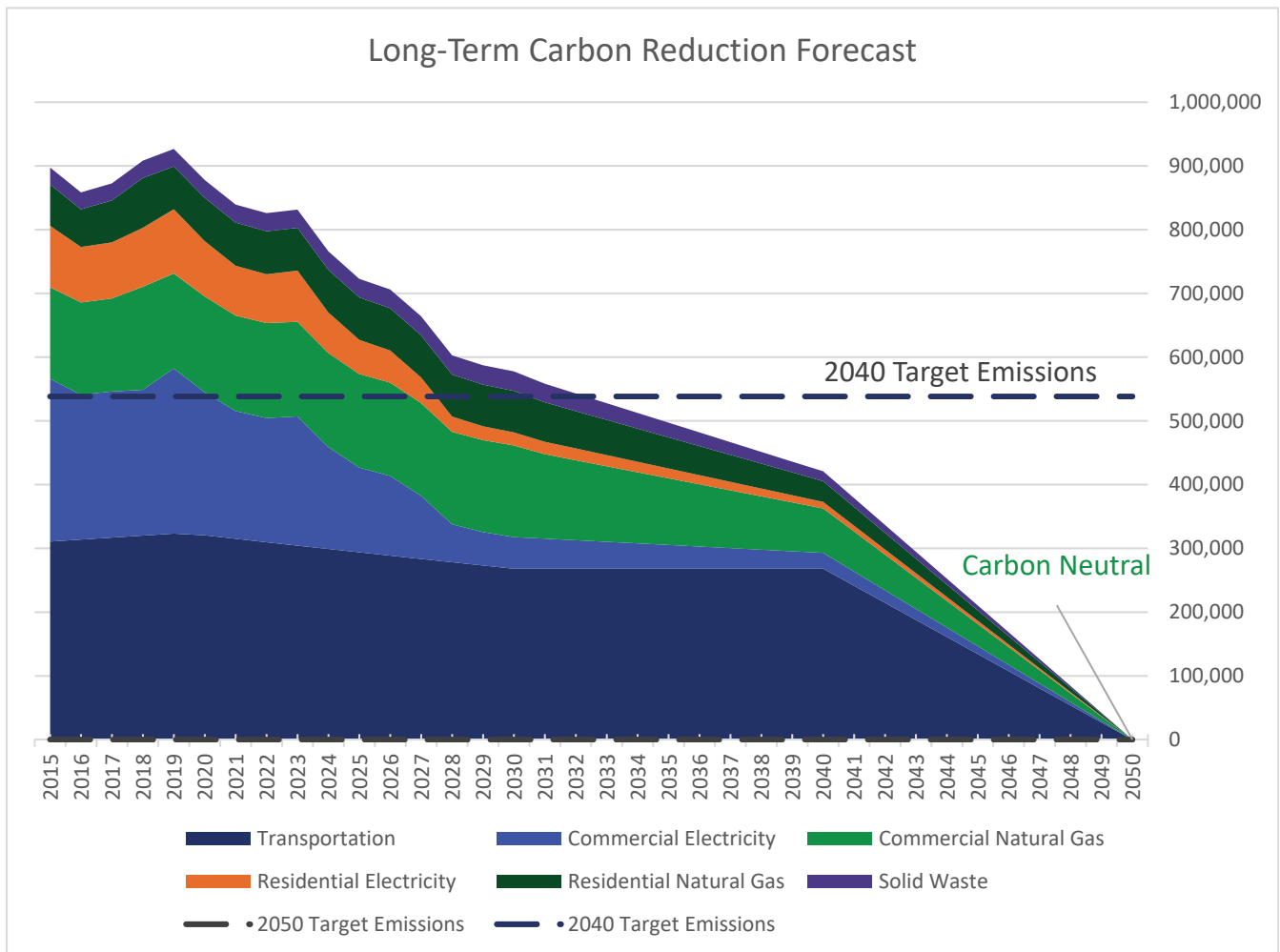

Figure 16. 2015 Baseline & 2050 Forecasted Carbon Inventory

Major Pathways Summary to 2050 goals
Technological breakthroughs & price declines
Decarbonized and renewable grid electricity (Wind, PV, hydro)
Distributed renewable generation (PV & geothermal)
Heat fuel-switching to renewables
Energy storage (electricity, heat, etc.)
Smart grid districts, blocks, and buildings
Electrification of transportation
Renewable hydrogen to power heavy-duty transport, heating and industry
Major reductions in single occupancy vehicle miles traveled through transit, biking, and walking
Biodiversity to offset carbon
Zero waste goal (circular economy)

Table 4. Major Pathways to 2050

Biodiversity

Increase urban integration of natural architecture including biophilic design

Biophilic design seeks to use nature to aid in building form and function while including health, well-being, and productivity outcomes that are beneficial.

Building Blocks

- Research and connect nature with key performance indicators for school, work, home, faith-based, and play communities
- Determine best practices for local geography and needs
- Work with partners to create demonstration prototype for replications
- Pass ordinance permitting biophilic site and building design elements such as trees, landscaping, green roofs, bio walls, aquaponics, greenhouses, rainwater harvesting, thermal massing, standards for bird-friendly urban design, etc.

Create a campaign to market the benefits of sustainable & green homes

There is currently very little focus on the benefits of a "green" home in the city. Green is a broad description. It could encompass a very energy-efficient home with building materials that have low-to-no volatile organic compounds, or a building foundation that is incorporated respectfully into the natural terrain and uses native landscaping species.

Building Blocks

- Build on the City's Net Zero Energy Building Guide for sustainable and green construction with additional trainings, public awareness campaigns, design competition for a major commission, and incentives
- Through the Parade of Homes or other tours, market the benefits of a net-zero sustainably designed home

- Use existing ratings systems like Leadership in Energy and Environmental Design, etc.

Transfer of Development Rights to protect nature and achieve sustainable growth

A way to safeguard nature and guide where urban growth should occur is to allow the transfer or trading of development rights (TDRs)[40] so that there is development compensation in return for protecting environmental sensitive areas or prime agricultural lands.

Building Blocks

- Research models that have been shown to be effective
- Use real estate assessing, the Biodiversity Index, carbon value development calculator, etc. for determining credits in internal site transfers or externals sales
- Work with multi-jurisdictional governmental units to achieve buy-in on rural development, urban compact growth, agriculture, sensitive ecosystem areas and TDR market standards
- Determine sending and receiving zones
- Pass a TDRs system across the jurisdictions
- Administer the program and TDR bank

Residential

Pass a residential rental energy efficiency requirement

Residential rental markets are often a particularly hard area to tackle, as landlords may lack incentives to install energy-saving measures when the tenant pays energy bills. One way that jurisdictions have begun to address this issue is by passing residential energy efficiency requirements that require disclosure or upgrades for rentals.

Building Blocks

- Convene landlords in Eau Claire to discuss feasibility, challenges, and possible structure of a rental energy efficiency requirement
- Find volunteer property owners to participate in a pilot program and explore offering tax incentives for those participating
- Explore policy options from peer cities, including policies that:
  - Establish ratings for buildings
  - Incentivize building owners to share utility costs with tenants
  - Require energy disclosure for rentals

Increase integration of battery storage for residential homes, especially in conjunction with on-site solar PV

Battery storage allows residents to store solar generation on-site and then use the electricity when they need it. In addition, residents can manage the time of electricity use for lowest costs, and retain

---

[40] https://www.uwsp.edu/cnr-ap/clue/Documents/PlanImplementation/Transfer_of_Development_Rights.pdf

electricity in the event of an outage. These technologies are still cost prohibitive for many customers, though costs are expected to come down over the next decade.

Building Blocks

- Identify funding sources for a residential solar plus storage demonstration project

Commercial, Industrial, and Institutional

Energy Efficiency

Work with local utilities to accelerate adoption of smart grid technologies and real time energy billing

Smart grid technologies, such as real time energy billing, are currently available and have the potential to help customers reduce energy bills by providing detailed energy use information. But this technology has not been widely adopted in Wisconsin. To increase adoption, the City will work to educate businesses about its availability and benefits.

Building Blocks

- Roll out a pilot program with large industrial customers to determine payback
- Utility deploys smart meters to commercial customers
- Host educational events and advertisements to promote benefits and how to use the technology to improve energy efficiency

Adopt a building code for commercial buildings in Eau Claire with more stringent efficiency requirements

Building codes are an essential mechanism for improving energy efficiency in new construction and major renovation projects. Wisconsin currently has a statewide building code that preempts local jurisdictions from passing more stringent codes or requirements. Changes to the state law and allowances would need to happen before Eau Claire could pass its own codes or requirements.

Building Blocks

- Advocate for a more stringent commercial code or stretch codes at the state level

Develop an eco-industrial park

An eco-industrial park would be a site within Eau Claire that demonstrates closed loop manufacturing and business practices, such as businesses focused on the circular economy, or co-locating businesses that can make use of waste streams as inputs to new processes/products.

Building Blocks

- Assess interest and possible tenants for an eco-industrial park
- Review existing and relevant examples from other cities globally

Support, educate, and market the benefits of the using reflective roofs in the building sector

Reflective roofs, also known as a "cool roof," can be designed to reflect more sunlight and absorb less heat than a standard roof. Reflective roofs can be made of highly reflective paint or reflective tiles/shingles that make a significant impact on the temperature of a roof. A standard dark roof can reach temperatures of 150°F or more in the summer, while a reflective roof can stay more than 50°F cooler under the same conditions.[41]

Building Blocks

- Use the Net Zero Energy Building Guide to educate on the benefits of a reflective roof
- Partner with CVTC, homebuilders, and home improvement stores to educate and market the benefits of reflective roofs
- Pass an ordinance that requires commercial roofs to be reflective

Renewable Energy and Strategic Electrification

Increase integration of battery storage for commercial buildings, especially in conjunction with on-site solar PV

Battery storage is quickly gaining popularity and holds promise to reduce peak loads and reduce emissions for buildings. However, this technology has not yet proven to be cost effective for larger buildings, and is not widely adopted. To help break down barriers to adoption of this technology, work to create relatable pilot projects.

Building Blocks

- Work with local institutions to create a pilot project of battery storage paired with solar on a small and relatable scale
- Identify smaller commercial sites to test battery storage technologies
- Investigate mobile storage solutions with utility via EV buses

Increase adoption of air- and ground-source heating and cooling technologies including geothermal systems for commercial buildings and campuses

Ground- and air-source heating technologies are an efficient way to use renewable energy to power building heating and cooling. Advanced planning can help identify opportunities for new commercial development to consider the benefits and feasibility of this option.

Building Blocks

- Assess building types and locations within Eau Claire that would be suited for ground source heating and cooling
- Assess feasibility and carbon impacts of a district heating and cooling system that is renewably powered

---

[41] https://www.energy.gov/energysaver/design/energy-efficient-home-design/cool-roofs

- Work with local colleges and universities to build commercial-scale demonstration projects of strategic electrification technologies

Transportation

EcoBlock

Scaling what is required for meeting the 2050 goals will be a challenge, especially in existing parts of the city. New development schemes are needed. One example noted on page 25 is the EcoBlock, which takes an integrated systems design approach with land use, transportation, energy, water and waste.

Building Blocks

- Research promising urban planning schemes such as the pilot concept EcoBlock
- Work with partners to understand what systems could be adapted or transformed economically
- Alter development codes after 2030 to address gaps in achieving 2050 goals

Explore and implement opportunities for bus rapid transit along high-frequency routes

Express or Bus Rapid Transit (BRT) services may provide faster times to attract ridership. BRTs often provide a fixed guideway route with stations, however this option may prove costly without a master development plan.

Building Blocks

- Invest in opportunities in Transit Development Plans
- Use the Comprehensive Plan's Land Use and Growth Management Plan to determine routes and to support news areas of growth and densification
- Seek federal grants to study and possibly to implement BRT

Support Passenger Rail

The West Central Wisconsin Rail Coalition (WCWRC) has been promoting passenger high-speed and commuter rail alternatives since the 1990s. The current proposal is for a public–private operation between Eau Claire and the Twin Cities.

Building Blocks

- Work with and support partners such as WCWRC for intercity connections, regional and long-distance operations
- Continue to advocate for remaining in Wisconsin and Minnesota state rail plans
- Advocate for supportive legislation and regional transit authorities
- Perform required environmental and engineering studies
- Pursue construction funding if there are findings of no significant impact

Waste

Develop a pay-as-you-throw program to incentivize increased recycling and waste reduction

Pay-as-you-throw (PAYT) programs, also known as unit pricing or variable-rate pricing, charge residents for the collection of solid waste based on the actual amount that they throw away. A major difference between the current system is that PAYT is not paid by quarterly fixed fees but rather by a variable rate in a similar manner to monthly electricity bills. Challenges with switching to a PAYT system are there is already a very convenient system in place and customers can choose container sizes depending on the level of waste generated.

Building Blocks

- Create a neighborhood pilot program for PAYT and explore potential grant funding to launch such a program
- Develop policies and ordinances which require all trash haulers to adopt the same system of collecting separated waste
- Explore any needed safety net to make private companies comfortable with adopting and transitioning to a PAYT system
  - Explore the need for public dollars to make up the difference between lower revenue from reduction of trash

Explore the feasibility of a local Materials Recovery Facility (MRF)

Developing a MRF may represent feasibility challenges because there is no current economic incentive to build and maintain such a facility locally. A major obstacle to the economic viability of a MRF is the development of end markets for the recycled material. However, a MRF may be an important piece of the puzzle required to develop a local circular economic model. Others have found moving to a circular economy with particular materials and products provide long-term economic, social, and environmental benefits. This transition may generate jobs, increase the resiliency of the economy, increase the accessibility of goods, maximize the value of resources and reduce waste.[42]

Building Blocks

- Explore "take back" policies which would require local companies to buy a certain amount of recycled materials
- Develop a campaign to address upstream production by working with companies to develop product design which supports a circular economy

---

[42] Circular Economy Policy at https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/response-to-china-national-sword/circular-economy-policy

APPENDIX C: BUILDING ENERGY DATA

This appendix includes the most recent three years of Eau Claire's energy data for Xcel Energy and Focus on Energy customers, provided through Xcel Energy's Partners in Energy service, as well as housing and demographic data for the city. This information was used to inform the goals and strategies of this plan. Data include energy consumption, energy efficiency and renewable energy program participation data, and maps demonstrating how the community uses and saves energy.

Building Energy Use

Eau Claire is served by two electricity providers, Xcel Energy and Eau Claire Valley Electric Cooperative. Xcel Energy provided 99% of the electricity consumed in the baseline year 2015, and data below includes both utilities unless otherwise noted. Xcel Energy is the only provider of utility natural gas service in the City of Eau Claire. Energy use data and maps are shown below.[43]

Figure 17 outlines the premise breakdown for Xcel Energy electric customers by sector for the City of Eau Claire in 2018. Municipal energy use is often included with commercial and industrial customers.
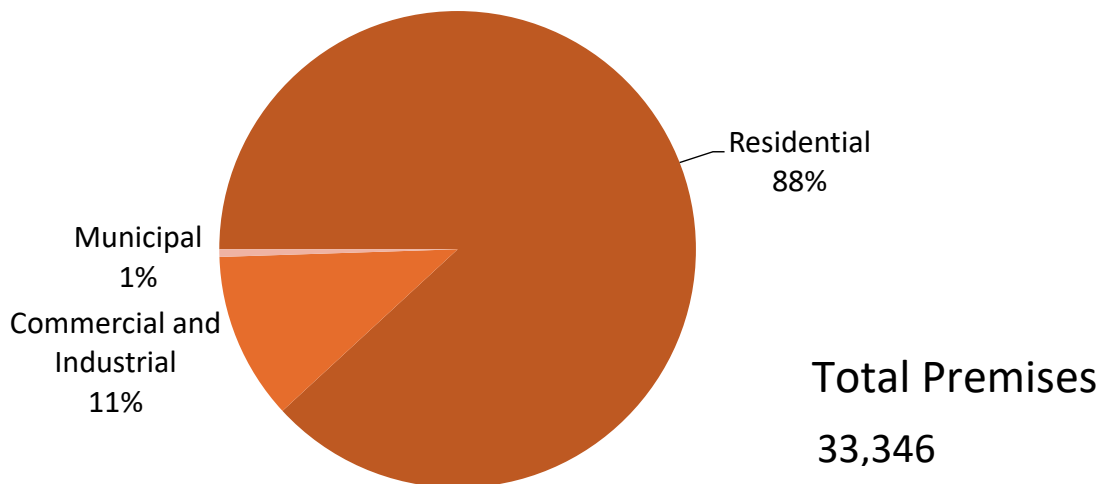
Figure 17. Xcel Energy Electric Premises by Sector, 2018[44]

Figure 18 below shows electricity use trends in Eau Claire between 2015 and 2018. Electricity use has remained relatively flat between 2015 and 2018. The graph also shows that the commercial, industrial, and institutional sector accounts for a greater portion of community-wide electricity use than the residential sector. In 2015, the baseline year for this plan, the residential sector accounted for 27% of community-wide electric use.

---

[43] Xcel Energy data in this plan are from Xcel Energy's annual Community Energy Report for the City of Eau Claire unless otherwise noted. www.xcelenergy.com/working_with_us/municipalities/community_energy_reports
[44] Xcel Energy Partners in Energy Data
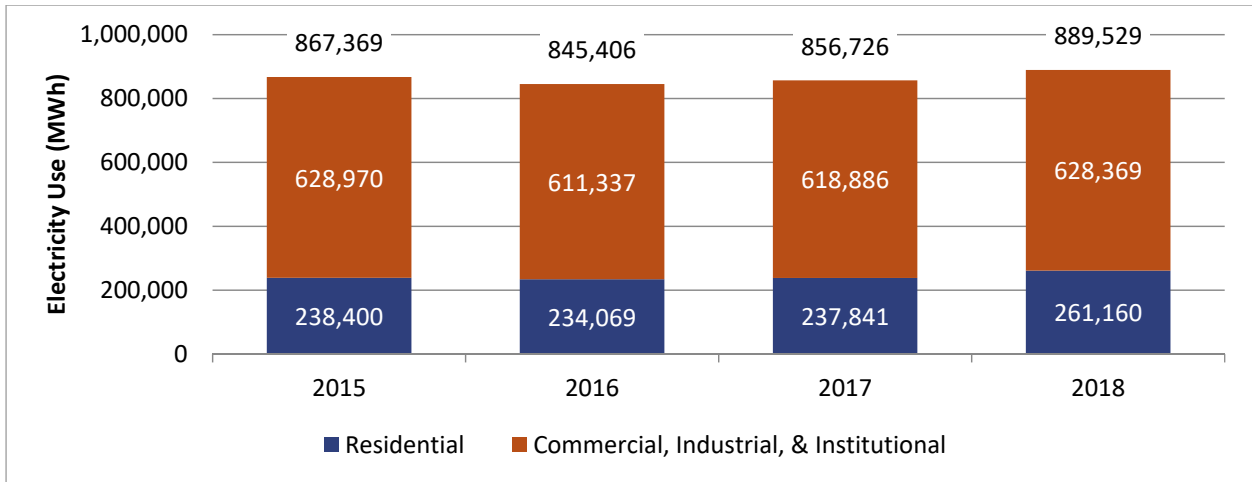
Figure 18. Electricity use Trends in the City of Eau Claire, 2015 – 2018

Figure 19 below shows natural gas use from 2015 – 2018 in the City of Eau Claire. As natural gas is often used as a heating source, consumption varies based on weather. 2018 was a relatively cold year in the upper Midwest, likely contributing to higher than average natural gas use. Similar to electricity, natural gas used by the commercial, industrial, and institutional sector is greater than that used by residents in Eau Claire. In 2015, residents consumed 32% of natural gas in the city.
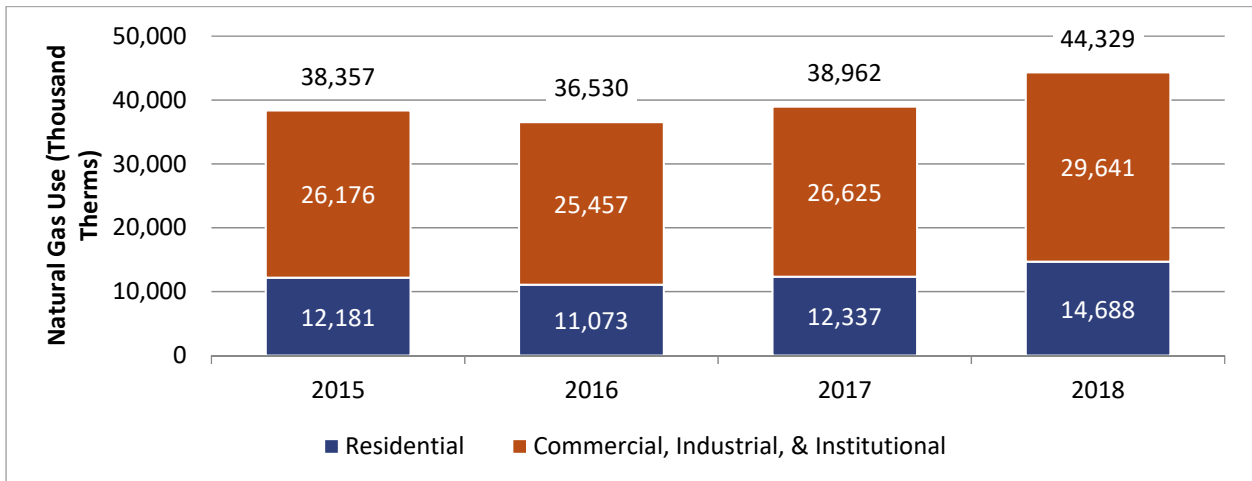
Figure 19. Natural Gas use Trends in the City of Eau Claire, 2015 - 2018

The maps below show average residential electricity and natural gas use by census tracts. They demonstrate where energy is most heavily used on a per-premise basis within Eau Claire. Note that maps only include data for Xcel Energy customers.
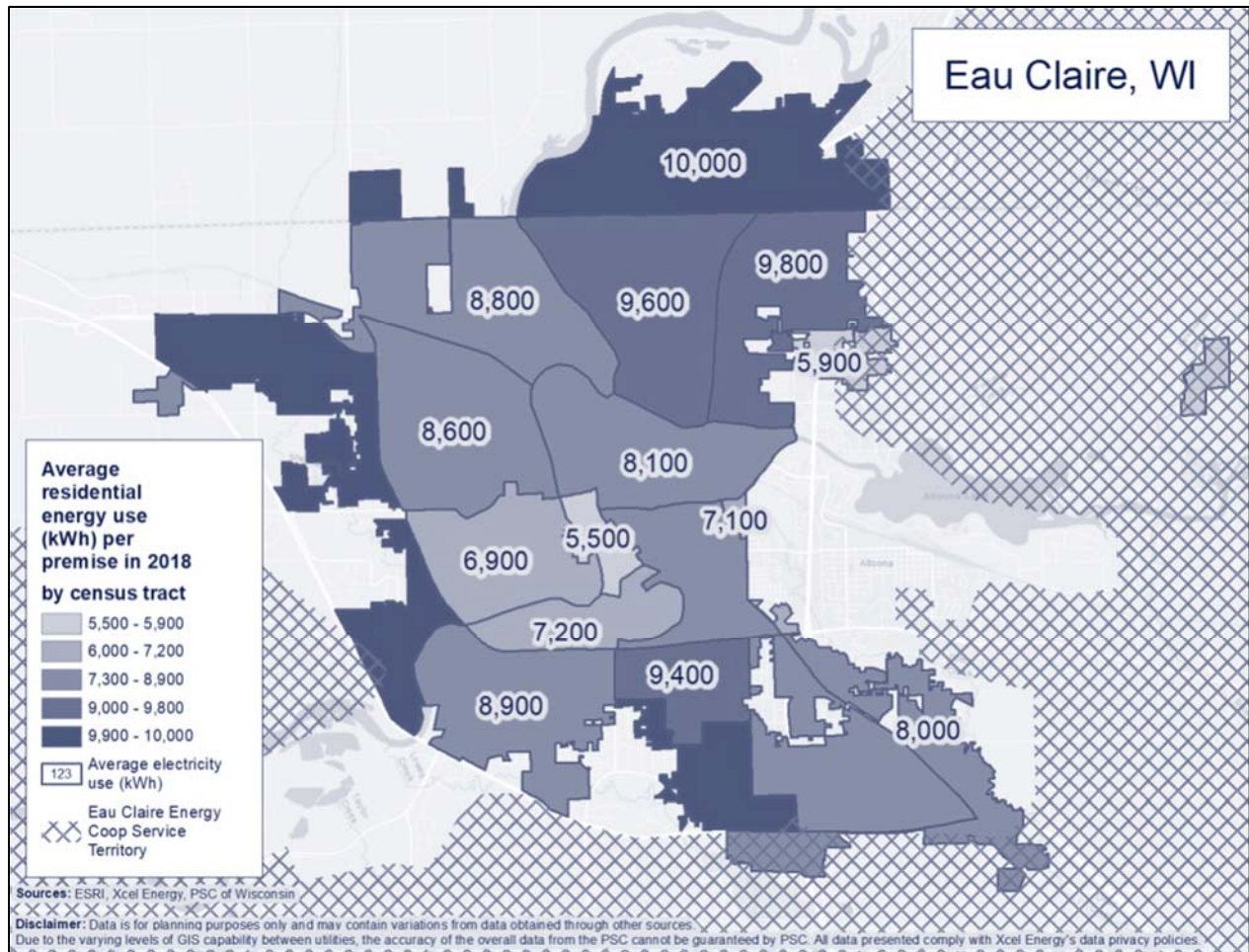
Figure 20. Average Xcel Energy Residential Electricity use (kWh) per Premise, 2018[45]
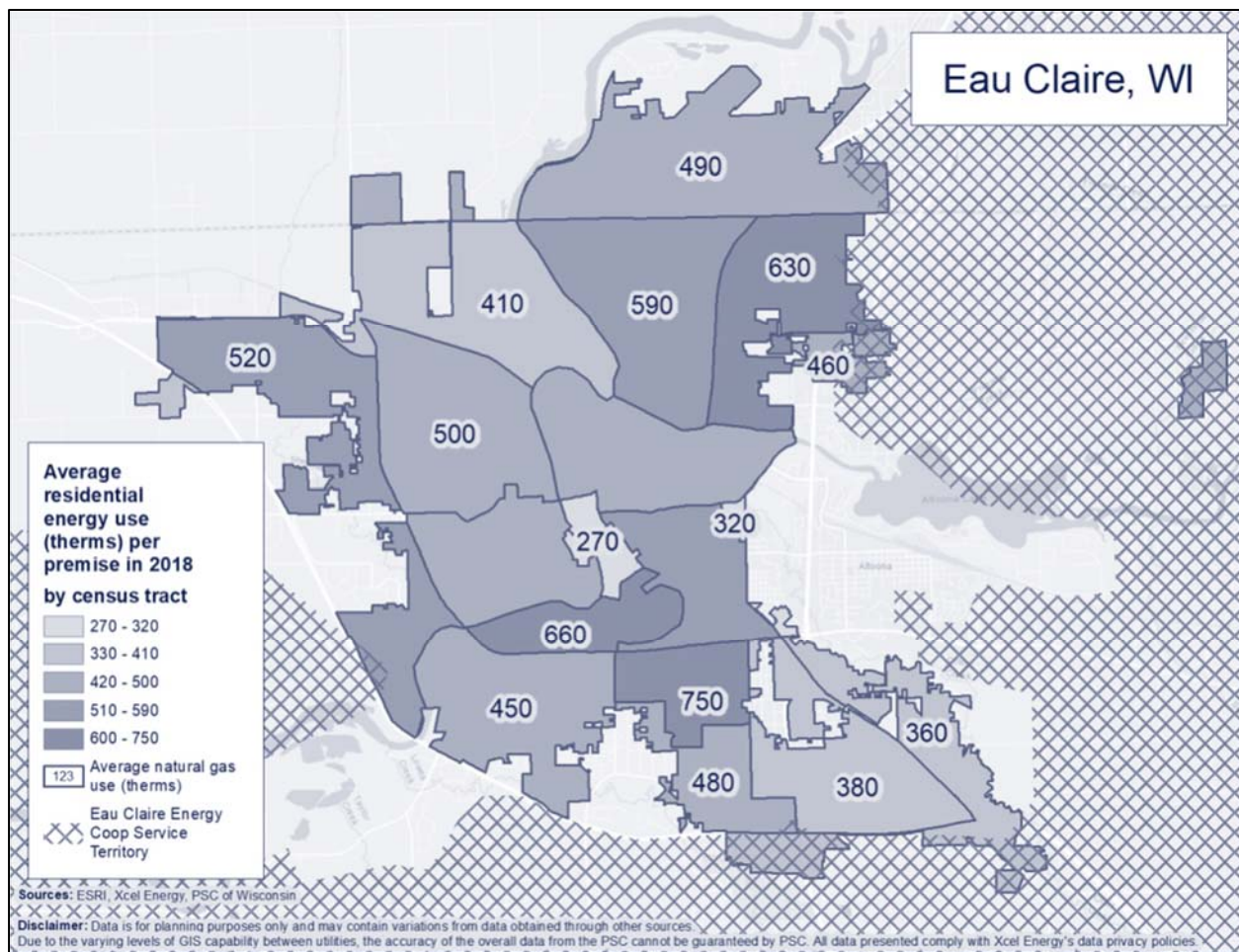
Figure 21. Average Xcel Energy Residential Natural Gas use (therms) per Premise, 2018[46]

Housing Data

The local housing stock influences the residential energy used in a community, as well as opportunities for energy efficiency and on-site renewable energy. In 2017, the City of Eau Claire had just under 29,000 housing units and the average household income was $47,660. Over 45% of the housing stock of Eau Claire was renter occupied in 2017, likely a result of having a large student population.

---

[46] *Ibid.*

Units in Structure	Count	Percent
1-unit, detached	15,620	54.3%
1-unit, attached	2,206	7.7%
2 units	2,868	10.0%
3 or 4 units	2,814	9.8%
5 to 9 units	2,085	7.2%
10 to 19 units	626	2.2%
20 or more units	2,142	7.4%
Mobile home	413	1.4%

Table 5. Housing by Number of Units in Structure, 2017[47]

Year Built	Count	Percent
2010 or later	830	2.9%
2000 to 2009	2,854	9.9%
1990 to 1999	3,941	13.7%
1980 to 1989	3,623	12.6%
1970 to 1979	5,207	18.1%
1960 to 1969	2,748	9.5%
1950 to 1959	2,635	9.2%
1940 to 1949	2,025	7.0%
1939 or earlier	4,927	17.1%

Table 6. Age of housing stock, 2017[48]

Figure 19 and Figure 21 above describe natural gas use and trends in Eau Claire. While in the upper Midwest, natural gas is the primary heating source for residents, not every home in Eau Claire used utility natural gas for heat.[49] Table 7 below outlines the top heating fuel sources for Eau Claire households. Fuel oil for heating continues to decline being replaced by cheaper natural gas.

Fuel Type	Units	Percent
Utility gas	17,167	62.6%
Electricity	8,045	29.4%
Fuel oil, kerosene, etc.	1,038	3.8%
Bottled, tank, or LP gas	610	2.2%

Table 7. Top House Heating Fuels, 2017[50]

---

[47] Data from U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

[48] Data from U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

[49] U.S. Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457A and EIA-457C of the 2015 Residential Energy Consumption Survey.

[50] Data from U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Residential New Construction

The table below outlines residential new construction development in the City of Eau Claire. This development data lends insights into the ways that the city is growing.

Permits	2016	2017	2018
Single-family	75	79	83
Duplex	30	25	24
Condos	12	24	50
Multi-family	156	101	94
TOTAL	**273**	**228**	**251**

Table 8. New Residential Construction (individual dwellings), 2016 - 2018[51]

Employment Data

Commercial, industrial, and institutional buildings vary greatly in how they use energy, whether for manufacturing, or to heat and light an office building. The table below outlines the industries in Eau Claire that employ the largest number of people. Knowing where more people are employed lends some insight into the industries that may consume a greater portion of Eau Claire's electricity.

Industry	Employees
Health Care and Social Assistance	12,102
Retail Trade	7,076
Manufacturing	5,449
Educational Services	4,212
Administrative and Support Services	2,964
Finance and Insurance	2,797
Transportation and Warehousing	2,583
Public Administration	2,262
Construction	2,154
Professional and Technical Services	1,965

Table 9. Eau Claire County Largest Industries & Employees (2018) [52]

---

[51] Development Update, 2019. Planning Division, City of Eau Claire, Wisconsin
[52] Wisconsin Department of Workforce Development-September 2018 Data

Energy Efficiency Program Participation and Savings

The tables below show energy efficiency program participation for Eau Claire businesses and residents, through Focus on Energy delivered programs.[53]

Program Name	Participant Count			Total Energy Savings (First Year)	
Business Program	*2016*	*2017*	*2018*	*Total Electricity Savings (kWh) 2016 - 2018*	*Total Natural Gas Savings (therms) 2016 - 2018*
Agriculture, Schools and Government	25	20	18	3,301,496	139,997
Business Incentives	42	65	49	7,354,190	51,683
Chains and Franchises	11			1,472,122	0
Communications Providers Initiative			1	39,420	0
Design Assistance	1	2	3	1,306,781	65,262
Emerging Technology	1			0	0
Large Energy User	6	8	7	13,432,616	99,510
Multifamily Direct Install	3	33		409,852	4,905
Multifamily Energy Savings	14	8	5	155,339	10,206
Multifamily New Construction		2		260,245	0
RECIP-Business Incentives			2	60,613	0
Retail Lighting and Appliance	20			1,173,349	0
Small Business	7			125,365	5
Small Business V2		25	32	840,338	4,111
Strategic Energy Management (SEM)			1	0	0
TOTAL	**130**	**163**	**118**	**29,931,24**	**375,679**

Table 10. Focus on Energy Business Program Participation and Energy Savings data for Eau Claire City, 2016 - 2018

---

[53] Source: Focus on Energy. Focus on Energy provides energy efficiency programs to customers across all of Wisconsin in partnership with local utilities, including Xcel Energy and Eau Claire Energy Cooperative. For more information on energy programs from Focus on Energy at focusonenergy.com.

Program Name	Participant Count			Total Energy Savings (First Year)	
	2016	*2017*	*2018*	*Total Electricity Savings (kWh)* *2016 - 2018*	*Total Natural Gas Savings (therms)* *2016 - 2018*
Business Program					
Appliance Recycling		56	59	117,737	0
Connected Device Kit Program			14	2,804	120
Home Performance with Energy Star		265	174	1,498,791	163,721
Home Performance with ENERGY STAR V3	117			264,237	79,505
New Homes	81	62	44	283,201	76,896
Renewable Rewards - Residential		13	12	151,600	0
Retail Lighting and Appliance	20	94	194	5,838,353	12,209
Simple Energy Efficiency	187	1,639	4,562	1,066,596	47,397
TOTAL	**405**	**2,129**	**5,059**	**9,223,319**	**379,847**

Table 11. Focus on Energy Residential Program Participation and Energy Savings data for Eau Claire City, 2016 – 2018

Renewable Energy

This plan has strategies to increase the number of in-boundary installations and subscribers to renewable energy programs. There are approximately 36 solar systems (residential and commercial) equaling about 2 MW of installed solar within Eau Claire.[54] Xcel Energy's Windsource® was a renewable energy subscription program offered to all their Wisconsin customers. More recently, Xcel launched the Renewable*Connect offering in Wisconsin, and all former Windsource subscribers were transitioned to it. Xcel also has a 3 MW community solar garden program called Solar*Connect Community®. Both renewable energy programs allow the customer to retain the Renewable Energy Credits (RECs).

Sector	Number of Subscribers	Amount Subscribed (kWh)
Community - Business Total	14	1,666,684
Community - Residential Total	1,301	2,726,410

Table 12. Windsource & Community Solar Subscribers in the City of Eau Claire, 2018 (Most recent year available)[55]

---

[54] https://www.google.com/get/sunroof/data-explorer/
[55] Source: Xcel Energy Community Energy Report, City of Eau Claire, 2018

APPENDIX D: MUNICIPAL GOVERNMENT

Baseline Carbon Inventories

The City of Eau Claire municipal operations have seen significant reductions in greenhouse gas emissions from 2015 through 2018. The majority of the reductions come from the water and wastewater sector thanks to the wastewater treatment plant upgrades which utilizes 80% of the total biogas for the generation of energy. Between 2015 and 2018 the purchased grid electricity by the water and wastewater sector was reduced by roughly 2.3 million kWh and natural gas was reduced by 131,870 therms. This major reduction in energy along with a 11% reduction in grid carbon intensity between 2015 and 2018 correlates to a total reduction of 2,361 MT CO_2e in the water and waste water sector.

Although there has been success at reducing emissions across the entire City operations due in part to Xcel Energy's cleaner electricity and the wastewater treatment plant biogas upgrades, the building and facilities sector has increased in terms of total energy usage. Buildings and facilities electricity usage has increased by roughly 790,000 kWh (14%) and natural gas usage by 47,000 therms (17%) between 2015 and 2018. Total diesel and gasoline consumption have also increased between 2015 and 2018 for the transit and fleet. Diesel consumption increased by roughly 31,000 gallons (12%) and gasoline by roughly 6,740 gallons (6%). The main factors for these overall increases are new facilities, weather, and additional fleet mileage driven.

Municipal 2015-2018 Carbon Inventories

2015
17,547 CO$_2$e MT

2016
14,809 CO$_2$e MT

2017
15,460 CO$_2$e MT

2018
15,435 CO$_2$e MT

- ■ Buildings & Facilities
- ■ Vehicle Fleet
- ■ Employee Commute
- ■ Water & Wastewater Treatment Facilities
- ■ Street Lights & Traffic Signals
- ■ Transit Fleet
- ■ Solid Waste Facilities
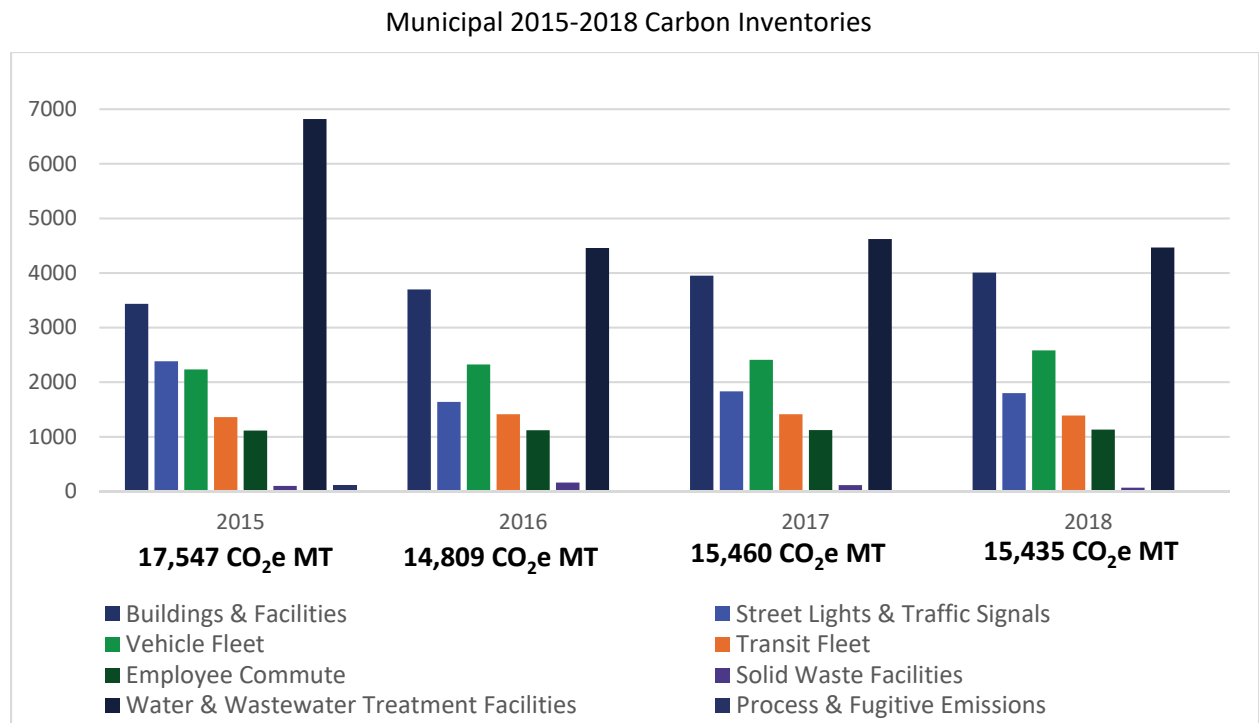- ■ Process & Fugitive Emissions

Figure 22. Carbon Dioxide Equivalent Metric Ton (CO₂e MT) Inventories from 2015-2018 for the City of Eau Claire

Decarbonization

This Renewable Energy Action Plan sets forth how to meet the same community goals of carbon-neutrality and 100% renewable energy by 2050 for municipal operations. The City can help lead the way and provide an example for local residents, businesses, and institutions to do similar. The City is positioned to exceed the 30% 2030 interim greenhouse gas reduction if Xcel Energy's carbon intensity forecast is realized. Below is a graph which represents the historic carbon inventories from 2015-2018 and a projected forecast of energy associated emissions. The assumption used for this forecast is a 1% annual growth of all energy usage for municipal operations. This includes electricity, natural gas, diesel and gasoline consumption across all of the sectors of operation.
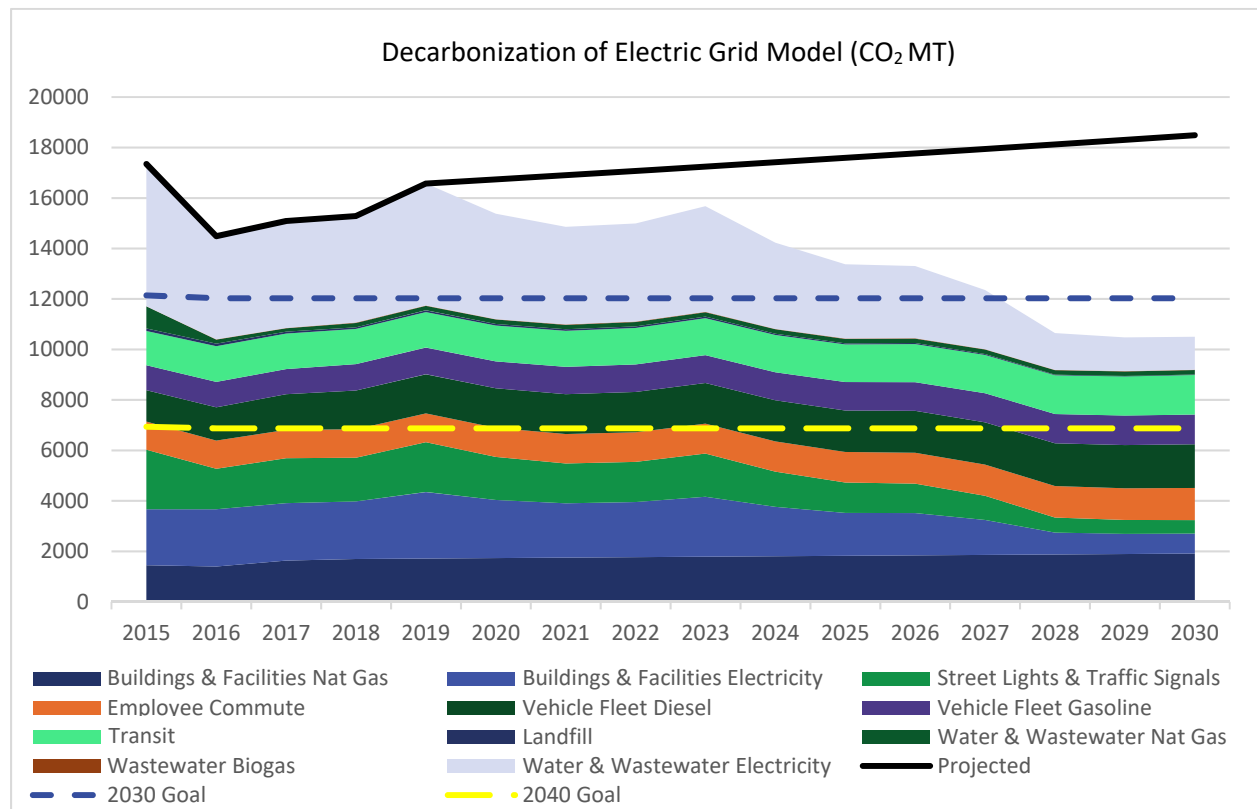

Figure 23. Carbon Dioxide Metric Tons Reduction modeled out to 2030 for City Operations (assumes 1% growth rate)

The only modeled assumption used to reduce emissions was the grid electricity carbon intensity forecast provided by Xcel Energy (see Table 13). In other words, the only modeled reduction shown in the above graph come from less CO_2 produced through the consumption of cleaner electricity.

Year	2019	2020	2021	2022	2023	2024
lbs CO_2/MWh	910	779	714	711	758	612
Year	2025	2026	2027	2028	2029	2030
lbs CO_2/MWh	522	503	408	251	227	220

Table 13. Carbon Intensity Forecast from Xcel Energy

Emissions Outlook 2030

The following pie charts demonstrate the emission profile of various City sectors of operation. The 2015 chart represents the baseline carbon inventory in CO_2. The 2030 chart shows the change to each operation of the City based on the composition of the grid decarbonization explained above. Those sectors that still rely heavily on fossil fuels in 2030 will represent a larger portion of emissions (e.g. 18% natural gas in buildings and 15% diesel in transit).
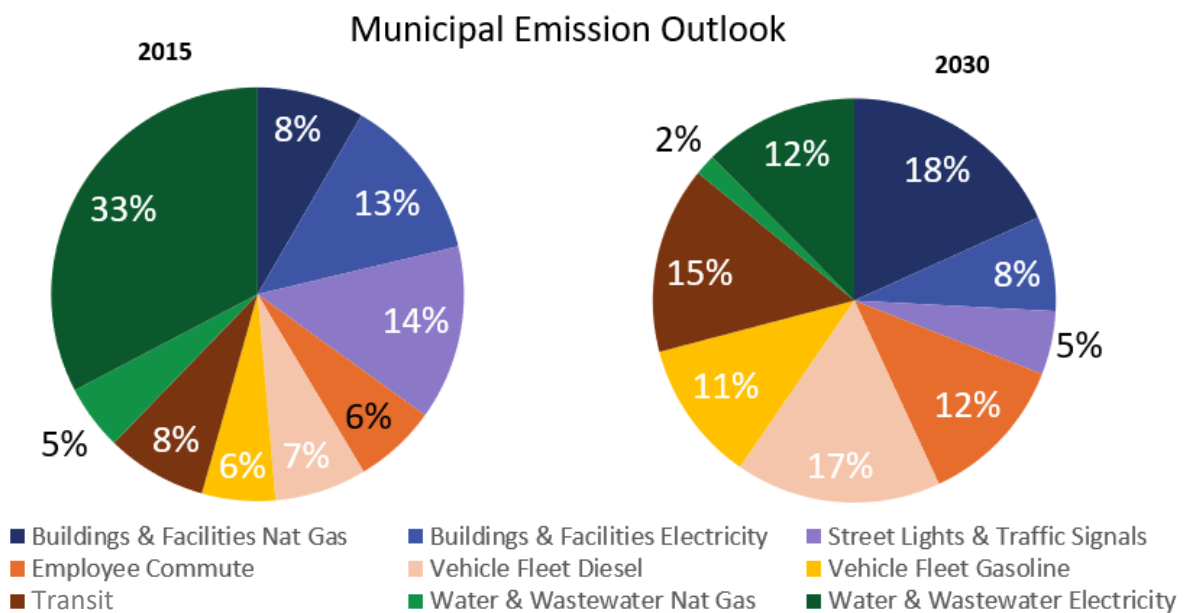

Figure 24. Carbon (CO_2) Emissions Outlook for Municipal Operations

Critical Pathways

Although emissions will be greatly reduced from a cleaner grid by 2030, and the biogas generation at the wastewater treatment plant remains a significant contributor, there still are challenges to reaching carbon neutrality and 100% renewable energy by 2050. These major concerns are growth and replacing natural gas and liquid fossil fuels with renewable energy.

Renewable Electricity

The City would be well positioned to meet its goals faster if all of its electricity consumption goes renewable by 2030. This critical pathway scenario includes greater biogas utilization, purchased renewable energy and on-site generation. The table illustrates the difference between what Xcel Energy projects to supply and the 40% the City would need to cover. Avoided carbon emissions becomes less as Xcel advances in pursuit of their 80% carbon-free electricity goal in 2030.

Sector	Projected kWh Use in 2030	Xcel Energy's 60% Projected Renewables in 2030	40% Needed for 100% Renewable Electricity	CO_2 Avoided with 100% Renewable Electricity in 2030	CO_2 Avoided with 100% Renewable Electricity by 2030
Buildings and Facilities	7,051,917	4,231,150	2,820,767	704	14,905
Water and Wastewater	13,054,296	7,832,578	5,221,718	1,303	28,195
Street lights and Traffic signals	5,339,375	3,203,625	2,135,750	533	11,286
Total	25,445,588	15,267,353	10,178,235	2,539	54,386

Table 14. 100% Renewable Electricity by 2030

The charts below show the 2018 total renewable energy for municipal operations. The wastewater treatment plant generates roughly 20% of the total, while about 8% comes from renewable grid electricity that the City can claim credit for (Xcel Energy's Certified Renewable Percent is 23%). If the City pursues 100% renewable electricity by 2030, about 48% of non-renewable energy would remain.
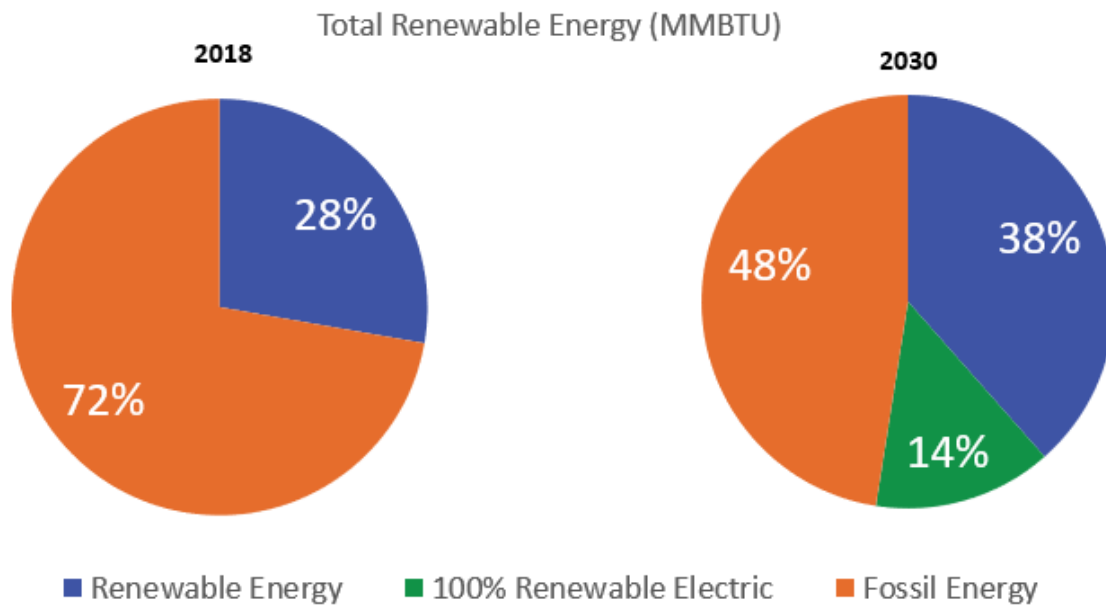

Figure 25. Percent Renewable Energy Outlook to 2030

Fleet Electrification

The City's Electric Vehicle Roadmap has a goal to convert 15% of the fleet to electrics by 2030. This means about 60 vehicles by the end of the decade are either fully battery electric or plug-in hybrids.
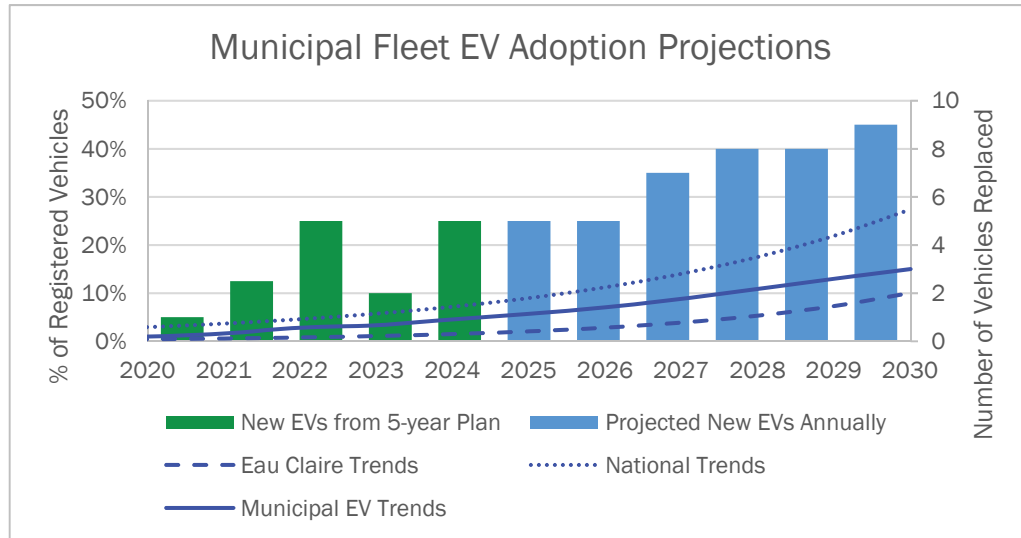

Figure 26. Electric Vehicle Roadmap Fleet Goal

Facility Energy Efficiency

The City's 2020 Facility Condition Assessment outlines improvements for over 660,000 square feet of facilities. Building recommendations for energy saving projects will help determine not only individual site savings but also an overall energy efficiency target. This will help offset the growth of energy consumption that is expected due to growing service needs. The City's Net Zero Energy Building Guide will be useful in achieving more energy efficient buildings along with incorporating renewables.
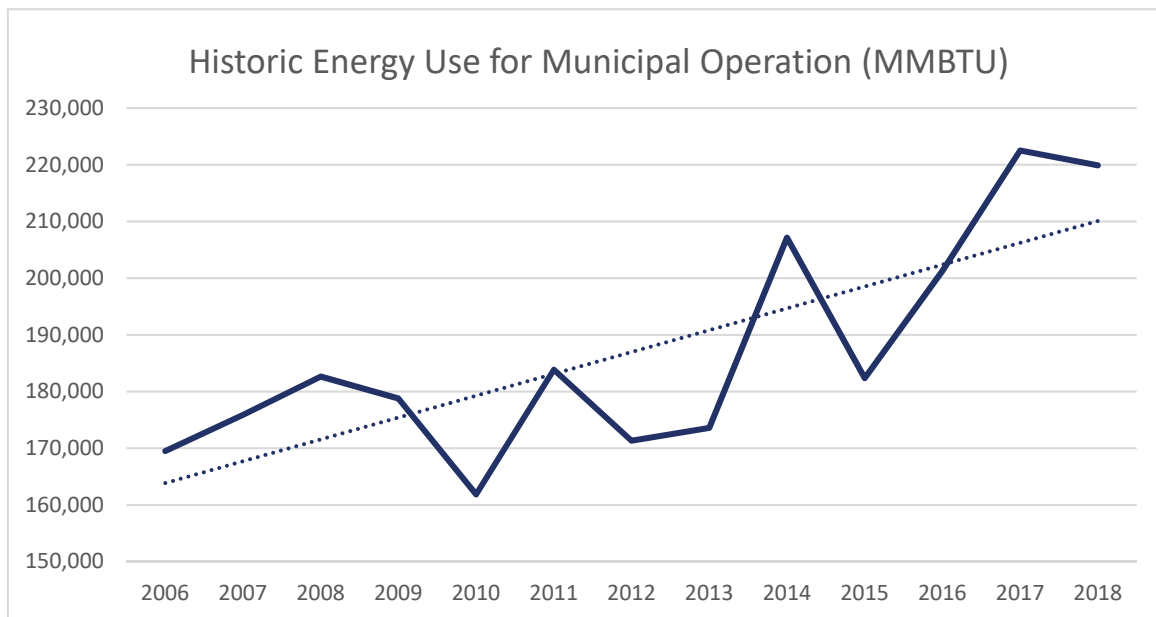

Figure 27. Historic Energy Use for Municipal Operations

Biodiversity Carbon Sequestration

Continue to increase tree plantings and biodiversity on municipal properties 1% per year. This is also recommended in the community's strategies earlier in this plan.

<u>Success Story</u>

The City of Eau Claire has been a TreeCity USA® for over 40 years. The City's managed public trees reduce annual energy use from shading and climate effects equal to 3,443 MWh and 458,584 therms, for a total savings of approximately $710,744. They reduce CO_2 by a net of 6,239 tons per year, valued at $91,122.

Work Plan

STRATEGY	MAJOR MILESTONES & TACTICS	STAFF	PRIORITY
Institutionalization			
I1. Align Organization with 2050 goals and sustainable city mission statement	• Communicate and integrate expectations • Organize and transition to align strategic plan, CIP, Buildings & Fleet Replacement plans, SOPs, work policies, Comp. Plan, and other plans with 2030 interim and 2050 long term goals in REAP plan	City Admin., Green Team, All	High, Year 1, Ongoing
I2. Strategic Communications	• Foster supportive culture to enable transition and action • Provide employee emails, newsletters, and/or Green Tips Magazine, etc. • Utilize social media opportunities • Report yearly progress (*DNR Green Tier Legacy Communities requirement) • Include in new hires and staff trainings	All Green Team Media Planning HR	High, Ongoing
I3. Renewable Energy Investment Fund	• Continue annual allocations for various renewable energy projects • Align requests with facility plans and strategic plan	Finance, All, Green Team	High, Ongoing
I4. Renewable Energy Operating funding	• Consider allocations for purchased renewable electricity per premise • Apply energy savings to help fund • Work with Xcel Energy under Energy Future Collaborative to determine options	Finance, All	High, Ongoing

STRATEGY	MAJOR MILESTONES & TACTICS	STAFF	PRIORITY
I5. Capital Improvement Planning	• Utilize existing or new plans (solar feasibility study, needs studies, FCA, etc.) in the development of CIP • In CIP ask does the project reduce GHGs or not? If not, how can the City mitigate it. Add checkbox to request form. • Develop calculators to inform purchasing decisions to align with 2050 goals • Investigate green bonding and other capital creation financing strategies	Finance, All Planning/ Purchasing Finance	High, Ongoing 2020 2022
I6. Energy & GHG emission benchmarking	• Continue data requests from utilities • Update annually and monitor progress and forecasting • Determine Energy Usage Intensities (EUIs) for buildings and MPG 1.5% annual improvements (15% 2030 goal)	Planning Community Services, Engineering	High, Ongoing
I7. Strategic Energy Management	• Set forth SOP on energy use for employees • Align projects strategically to CIP, purchasing to maximize Focus on Energy assistance and incentives • Use the FCA's findings • Establish EUIs for top energy users	Engineering & Community Services	High, 2021, Ongoing
I8. Renewable Energy targets	• Examine setting renewable energy interim goals as Eau Claire Area School District created	Planning	Medium, 2022
I9. Leverage & develop Sustainable Purchasing Policy	• Develop policy and approve at council • Integrate 2050 goals, plans and bid specs. • Develop/utilize carbon calculators and apply a carbon pricing shadow in purchasing decisions to align goals • Deploy trainings in key areas	Purchasing, Green Team	High, 2020, Ongoing
I10. Employee Travel policies and programs	• Continue to implement the travel policy • Consider adding carbon offsets for air travel • Consider adding employee benefits when carpooling or taking transit	Accounting	High, Ongoing Medium 2024
I11. Provide adequate specialization staff capacity	• Develop full-time coordinator position • Add Certified Energy Manager to manage projects and track energy savings • Maintain Green Team & work plans • Maintain internship position	HR	High, 2020
I12. Continue needed planning and policy efforts	• Determine need (green bldg. policies, strategic energy management, etc.) • Develop natural gas succession plan	Planning, others	Ongoing Medium to

STRATEGY	MAJOR MILESTONES & TACTICS	STAFF	PRIORITY
	• Update REAP Municipal Section		Low, 2026
I13. Utilize the Net Zero Energy Building Guide with City projects	• Sustainable Municipal Buildings Guidance • Provide training to the proper staff and departments • In the RFP process, require engineering firms and builders to use Net Zero Guide • Develop incentives such as RFP contest • At least one new construction project is built to net zero standards • Use Library as a test case	Engineering & Community Services Library	High, 2020, Ongoing 2020 2021 2020-2023
I14. Apply for grants	• Seek out and apply for related grants to help fund projects and/or plans	All	High, Ongoing
I15. Energy Future Collaborative	• Work with key partner Xcel Energy on implementing MOU's work plan • Ensure required utility data is provided to assess performance against goals	Planning	High, Ongoing
Projects			
P1. Improve energy efficiency in new construction, major renovations and existing buildings and infrastructure	• Leverage City's Net Zero Energy Building Design Guide • Use the FCA's findings • Continue to use resources such as Focus on Energy and Xcel Energy for energy efficiency rebates and incentives • Explore policy options to integrate energy efficiency into project approval process for new construction and major renovation, especially in cases where a developer requests a change in zoning or is receiving public funding or public land	Engineering & Community Services	High, Ongoing
P2. Utilize 100% of wastewater treatment plant biogas	• Asses the project economics • Investigate options for EV or biogas fueling • Secure capital funding	Utilities	Medium, 2025
P3. Increase onsite solar energy	• Use technical Solar-Ready Guide • Identify potential projects from 2018 renewable feasibility study • RFP for projects • Implement projects	Planning, Engineering & Community Services	High, Ongoing
P4. Require new City buildings to be solar ready	• Use City's Net Zero Energy Building Guide and Solar-Ready Guide to plan for future installations • Add solar-ready requirement to RFPs • Install needed panel, wiring, etc.	Planning, Engineering & Community Services	High, Ongoing

STRATEGY	MAJOR MILESTONES & TACTICS	STAFF	PRIORITY
P5. Study micro-grid, storage and PV at WTP	• Commission Feasibility study • Pair with back-up generation needs • Implement per CIP funding	Utilities & Planning	Medium, 2022-2025
P6. Explore renewable powered heating, cooling and hot water technologies, including geothermal in all major renovations and new construction projects	• Utilize Facility Condition Assessment to determine feasibility and cost • Explore strategic electrification across the heating sector for buildings • Work with Xcel Energy through the Energy Future Collaborative MOU • Implement CMF Geothermal Study, study under plaza for Library and City Hall, etc.	Planning, Engineering & Community Services	High, Ongoing
P7. Explore the impact and feasibility to utilize renewable energy subscriptions or develop a joint community project	• Work with utilities on best sites • Determine the needed accounting framework and feasibility to increase operation budget – and/or – • Seek support from other like-minded institutions/businesses that have goals to create a community/utility scale project	Planning, others	Medium, 2021-2030
P8. Implement EV Electric Vehicle Roadmap	• Implement plan recommendations • Continue to research/apply for EV grants • Use vehicle 5-yr. replacement plan to determine strategic electrification of municipal fleet • Pursue MPG 1.5% improvements annually (15% 2030 goal)	Fleet	High, Ongoing
P9. Install fleet vehicle charging infrastructure	• Follow strategies in the EV Roadmap • Continue to work with utility providers • Apply for EV charging infrastructure grants • Install needed infrastructure for light, medium and heavy-duty vehicles	Fleet	High, Ongoing
P10. Transition Buses to EVs	• By 2025 have at least one EV bus • By 2030 have one-third EVs buses • Apply for FTA and DOT grants • Explore new Transit Center having DCFC charging during dwell times	Planning, Transit & Fleet	Medium, Ongoing
P11. Require major renovations and new construction projects to add appropriate EV infrastructure	• Follow recommendations provided by the EV Roadmap • Align RFP process with EV Roadmap recommendations	Planning, Engineering & Community Services	High, Ongoing

APPENDIX E: GLOSSARY OF TERMS

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

Focus on Energy: Focus on Energy is Wisconsin's energy efficiency and renewable resource program, run in partnership with utilities. Focus on Energy offers programs to help residents and businesses manage energy costs and is funded by Wisconsin's investor-owned energy utilities and participating municipal and electric cooperative utilities.

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

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

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

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

Metric Tons of Carbon Dioxide Equivalent (MTCO$_2$e): A standard unit of measure for greenhouse gas emissions. The unit "CO$_2$e" represents an amount of a greenhouse gas whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO$_2$), based on the global warming potential (GWP) of a particular gas.

Net Zero Energy Building: A structure that annually produces as much energy on site as it consumes.

Premise: A unique identifier for the location of electricity or natural gas service. In most cases it is a facility. There can be multiple premises per building and multiple premises per individual debtor.

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

Resilience: The ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally-occurring threats or incidents.

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

Trade Ally: Trade Allies, or Business Trade Partners, are vendors and contractors who work with customers servicing, installing, and providing consulting services regarding the equipment associated with utility rebate programs. Trade Ally support for Focus on Energy programs can range from providing equipment or assisting with rebate paperwork, to receiving rebates for equipment sold.

APPENDIX F: DATA & ASSUMPTIONS

Community Baseline Data for Carbon Inventories

The carbon inventories for the Eau Claire community were developed using the ICLEI-USA Local Governments for Sustainability ClearPath software following their *U.S. Community Protocol*. Each inventory accounts for residential, commercial and industrial, transportation and solid waste emissions. Energy related emissions for the wastewater treatment plant are included in the commercial sector.

Residential, Commercial & Industrial

These sectors' emissions are associated with natural gas and electricity (fuel oil was insignificant). Assumptions followed the community protocol and ClearPath. Data was gathered through Xcel Energy community energy reports and electricity reports from Eau Claire Energy Cooperative.

- Natural gas emissions were determined by the measured usage of therms of natural gas in the community.
- Electricity emissions were determined by the measured usage of grid kWh of electricity in the community.
- To determine emissions associated with grid electricity, factor sets were used to create carbon intensity inputs. The emissions per kWh are measured by CO_2 lbs/MWh, CH_4 lbs/GWh and N_2O lbs/GWh which give an output for CO_2e accounting for the three greenhouse gasses.
- The quality of data assumptions for these sectors are considered High as it was a measured usage.

Transportation

Transportation emissions are associated with different modes of transportation in the community which includes vehicle miles traveled (VMT) for passenger vehicles and freight along with emissions associated with aviation travel.

- To determine community wide VMT, calculations were made based on WisDOT total county VMT for both Eau Claire County and Chippewa County. Below is a step by step process to determine community wide VMT.
    a. Determine percentage of the city population in Eau Claire County and Chippewa County.
    b. Multiply city population percentage of each county by the total VMT per county.
    c. Add the final VMT amount for each county to have total Eau Claire community VMT.
- VMT attributed to the Eau Claire community is then tied to various vehicle classifications which were determined by total DMV registrations by vehicle type and fuel type. For the baseline inventory the only fuels used were gasoline and diesel which held the highest percentage of vehicles.
- To determine the emissions associated with VMT, factor sets were created following ICLEI's *U.S. Community Protocol* and ClearPath. Factor set calculations include vehicle fuel economy, CH_4 per mile and N_2O per mile.
- Factors sets for transportation account for both gasoline and diesel in passenger vehicles, light trucks and heavy trucks.
- Aviation fuels (kerosene and gasoline) were obtained by the Chippewa Valley Regional Airport with local attribution at 5% of each type.
- Freight railroad attribution was considered insignificant and re-fueling occurs out-of-boundary.

- The quality of data assumptions for this sector is considered Medium as it was mostly modeled activity data using robust assumptions.

Solid Waste Emissions

- Solid Waste emissions assumptions followed the *U.S. Community Protocol* and ClearPath which required total methane emissions from the landfill along with attribution percentage.
- Methane emissions data was gathered through EPA Facility Detail for Seven Mile Creek Landfill.[56]
- Data assumptions made for this sector are High and include a local attribution percentage of 75% because it is assumed that 25% of the waste is outside of boundary.

Community Modeling & Forecasting Assumptions

Modeling and forecasting assumptions align with historic carbon inventories as well as strategies developed through the REAP planning process. All of the sectors assume a 1% growth rate in energy consumption from 2019-2030. The sectors modeled with strategies include residential, commercial and industrial (C&I), and transportation. Solid waste was not modeled against any strategies for emission reductions but followed the 1% growth rate.

Grid Decarbonization

- All modeling followed carbon intensity forecasts provided by Xcel Energy to represent emission reductions from a cleaner electric grid. Emissions associated with electricity consumption were determined using the previously provided table by Xcel.

Year	2019	2020	2021	2022	2023	2024
lbs CO_2/MWh	910	779	714	711	758	612
Year	2025	2026	2027	2028	2029	2030
lbs CO_2/MWh	522	503	408	251	227	220

Buildings Overview

- Energy data from 2015-2018 used historical energy usage and carbon inventories for Xcel Energy Community Energy Reports.
- For both commercial and residential sectors, 2019 is the starting point for the forecast which is an average of the previous years with a 1% growth rate attached.

Grid Electricity [57]

- 2015-2018 grid electricity emissions used historic Xcel Energy carbon intensity factors.
- Emission reductions from 2019-2030 were developed using the Xcel Energy carbon intensity forecast. Unit reductions in electrical energy from the energy efficiency strategies were subtracted against the 1% growth assumption, then multiplied against carbon intensity factors to come to CO_2 emissions.

---

[56] EPA Data for Seven Mile Creek Landfill at https://ghgdata.epa.gov/ghgp/service/facilityDetail/2016?id=1006964&ds=E&et=&popup=true
[57] Grid electricity modeling only measured CO_2

Natural Gas Usage

- Energy data from 2015-2018 used historical energy usage and carbon footprints for Xcel Energy Community Energy Reports.
- For both commercial and residential sectors, 2019 is the starting point for the forecast which is an average of the previous years with a 1% growth rate attached.

Transportation Overview

- Transportation emission modeling was completed using ICLEI's ClearPath "high level target planning" calculator for transportation.

Solid Waste Overview

- Emission followed a 1% annual growth rate with no reductions modeled.

Modeled Reduction Strategies

Electricity Energy Efficiency (EE)

- EE goals were developed from historic program participation in the Eau Claire community for both residential and commercial sectors.
- Reductions in electricity usage through EE strategies were modeled against a 1% growth assumption in both residential and commercial sectors.

Strategy & Goal	Total Reduction (2020-2030)
2% residential EE goal	45,518,516 kWh
3% commercial and industrial EE goal	170,907,752 kWh

Electricity Renewable Energy (RE)

- RE goals were developed from baseline information gathered on historical renewable energy subscribers.
- RE emission reductions were calculated by impact of kWh reductions per year based on average energy usage in 2018.

Strategy & Goal	Total Reduction (2020-2030)
200 residential households per year switch to 100% renewable electricity	17,000,000 kWh
15 new commercial & industrial renewable electric customers per year	24,000,000 kWh

Natural Gas Energy Efficiency (EE)

- EE assumptions for modeling natural gas emissions in residential and commercial sectors were developed from historic energy usage and program EE program participation.

Strategy & Goal	Total Reduction 2020-2030
1.4% residential EE goal	1,760,023 therms
1.5% commercial & industrial EE goal	3,795,282 therms

Natural Gas Renewable Energy (RE)

- For the residential sector this is assuming average residential gas use and that half of household gas use would be avoided by renewable technologies.
- Residential included 20 new renewable thermal heating systems with a total reduction in therms of 50,000 by 2030.
- Commercial and industrial included 5 new renewable thermal energy systems per year with a total reduction in therms of 200,000 by 2030.

Strategy & Goal	Total Reduction 2020-2030
20 new residential renewable thermal heating systems per year	50,000 therms
5 new commercial and industrial renewable heating systems per year	200,000 therms

Electric Vehicles

- Modeling for electric vehicles was done using ICLEI ClearPath planning module in the high-level target planning calculator for the transportation sector.
- Modeling emissions for transportation assumed a final percentage of electric vehicles of 10% by 2030 with 80% of charging from carbon-free sources, which is in line with Xcel Energy's carbon reduction goals. See the City's Electric Vehicle Roadmap for more information.

Strategy & Goal	Total Reduction 2020-2030
10% or 8,000 Electric Vehicles by 2030	30,000 MT CO_2 by 2030

Vehicle Occupancy

- An increase in vehicle occupancy was calculated using the ClearPath planning module calculator. It assumes a final population of 73,276 for the community growing at 1%, an average distance of personal auto trips of 10.3 miles[58], and a starting VMT per driver per year of 10,558 miles.

Strategy & Goal	Total Reduction 2020-2030
Increase vehicle occupancy from the Midwest average of 1.63 people per vehicle to 2 [59]	Total VMT reduction: 143,130,000 Daily VMT reduction: 39,213 Emissions reduction: 1.85% annually from business as usual emissions

---

[58] This is the default for the ClearPath calculator
[59] Midwest Vehicle Average Occupancy at https://nhts.ornl.gov/tables09/ae/work/Job90828.html

Municipal Baseline Data for Carbon Inventories

Quantifying Emissions

To complete the City of Eau Claire's municipal carbon inventories ClearPath, the emissions management software suite from ICLEI-USA, was used. Their *Local Government Operations Protocol Version 1.1* provides instruction on required greenhouse gas emission accounting, inventories and forecasting. The data assumptions made are High because they are direct purchases or records of the organization. Calculation-based methodologies involve the calculation of emissions based on "activity data" and "emission factors". The following has been adapted from the protocol with notations if activity data was used or not and what type of energy was used for the City of Eau Claire.

- Activity Data is the relevant measurement of energy use or other GHG generating processes (e.g. fuel consumption by fuel type, metered annual energy consumption, and annual vehicle mileage by vehicle type). The below activity data was used in conjunction with an emission factor to determine emissions. Emission factors are calculated rations relating GHG emissions to a proxy measure of activity at an emissions source. Emission factors are used to convert activity data, like energy usage, into the associated GHG emissions.
  a. **Facilities.**
     i. **Stationary combustion:** refers to the combustion of fuels to produce electricity, heat, or motive power used in a fixed location. Stationary combustion is Scope 1 (direct) emissions source. Scope 1 emissions from stationary combustion in seven different sectors should be reported:
        - Water delivery facilities (natural gas)
        - Power generation facilities (N/A)
        - Solid waste facilities (N/A)
        - Wastewater facilities (biogas)
        - Port facilities (N/A)
        - Airport facilities (N/A)
        - All other buildings and facilities not above (natural gas)
     ii. **Electricity use:** mainly Scope 2 (indirect) emissions. Emissions from the Scope 2 in the following sectors should be reported:
        - Streetlights and traffic signals
        - Water delivery facilities
        - Port facilities (N/A)
        - Airport facilities (N/A)
        - Vehicle fleet (N/A)
        - Transit fleet (N/A)
        - Power generation facilities (N/A)
        - Solid waste facilities
        - Wastewater facilities
        - All other buildings and facilities not above
     iii. **Fugitive Emissions from refrigerants and Fire suppression equipment:** buildings and facilities contain refrigeration systems, like air conditioners, chillers and refrigerators. These systems may use refrigerant that contain or consist of HFC compounds. Through the installation, use and disposal of these systems, refrigerant leaks are likely to occur. These leaks are considered Scope 1 fugitive emissions.

Since some of these compounds have large greenhouse warming Potentials (GWPs) even minor leaks can translate into significant eCO_2 emissions.

b. **Vehicle Fleet:** includes Scope 1 mobile combustion emissions, Scope 1 fugitive emissions from mobile air conditioning, biogenic CO_2 emissions from the combustion of biofuels and emissions from alternative fuel vehicles. The vehicle fleet should be reported as two sectors:
- Transit fleet (diesel)
- All other vehicles (diesel and gasoline)

   i. **Mobile sources** include both on-road and off-road vehicles such as automobiles, trucks, buses and construction equipment. The combustion of fossil fuels in mobile sources emits CO_2, CH_4, and N_2O.

   ii. **CO_2 emissions from vehicles Combusting Biofuels:** due to their biogenic origin, biofuels such as ethanol, biodiesel, and other blends of biofuels combusted in the vehicle fleet must be reported separately from fossil fuel CO2 emissions. (N/A)

   iii. **Emissions from non-highway vehicles**: fuel emissions factors are more appropriate than the distance-based emissions factors used to calculate emissions of non-CO_2 gases from other mobile sources because non-highway vehicles do not have the emission control technologies required of on-road vehicles and, in many instances do not record the number of miles traveled.

   iv. **Emissions from Alternative Fuel Vehicles/Electric Vehicles:** emissions from electric vehicles should be reported under Scope 2 emissions, since they consume electricity produced by the grid. (N/A)

   v. **Fugitive Emissions from Motor Vehicle Air Conditioning**

c. **Power generation facilities:** combustion facilities may burn any combination of the following fuels: coal, oil, natural gas, biomass, municipal solid waste or others for production of electricity and/or heat and steam. (N/A)

d. **Solid Waste facilities:** for Eau Claire are mainly landfills and their methane releases. (N/A)

e. **Wastewater treatment Facilities:** If generating power or heat at the wastewater facility and the electricity and/or heat are consumed entirely within the facility, it should report the Scope 1 stationary combustion emissions from generating that power in the Wastewater Treatment Facility sector, not in the Power Generation Facilities sector of the Standard Inventory Report.

f. **Other Process and Fugitive Emissions**
Scope 3 emissions sources: in addition to the Scope 1 and 2 emissions sources described above, a number of additional emissions sources of potential policy relevance to local government operations will be measured and analyzed. While reporting of scope 3 emissions is possible, doing so provides an opportunity for innovation in GHG management.

   i. Employee commute (diesel and gasoline)

   ii. Employee business ground and air travel (diesel and gasoline)

   iii. Waste related Scope 3 emissions Sources

APPENDIX G: ADOPTING RESOLUTION

No. 2020-91

RESOLUTION

RESOLUTION ADOPTING THE RENEWABLE ENERGY ACTION PLAN (REAP) AND ITS SUB-ACTION PLANS

WHEREAS, in March 2018 the City Council of Eau Claire passed goals for the municipal operations and the city to become carbon neutral and to run on 100% renewable energy by 2050; and

WHEREAS, the City Council accepted a grant from the Public Service Commission of Wisconsin's Office of Energy Innovation in November 2018 to prepare a Renewable Energy Action Plan; and

WHEREAS, the City Council directed the Sustainability Advisory Committee and staff to undertake the planning in their 2019 annual work plan; and
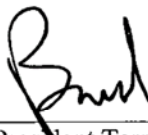
WHEREAS, a community stakeholder steering committee was formed to develop the Renewable Energy Action Plan (REAP) and help inform its sub-action plans, specifically the Electric Vehicle Roadmap, Net Zero Energy Building Guide and Solar-Ready Guide; and

WHEREAS, the City Plan Commission found the REAP and its sub-action plans are consistent with the Comprehensive Plan's Land Use, Sustainability, and Health Chapters.

NOW, THEREFORE, BE IT RESOLVED that the Eau Claire City Council adopts as part of the City of Eau Claire's Comprehensive Plan the Renewable Energy Action Plan, the Electric Vehicle Roadmap, Net Zero Energy Building Guide and Solar-Ready Guide.

BE IT FURTHER RESOLVED that these plans support the City's Strategic Plan and that the Eau Claire City Council directs the institutionalization of these plans, their goals and strategies into municipal purchases, operations and projects of the City of Eau Claire.

Adopted,
February 25, 2020

(SEAL) _____
President Terry L. Weld

(SEAL) _____
Acting City Manager Jacob Winzenz

(ATTESTED) _____
City Clerk Carrie L. Riepl