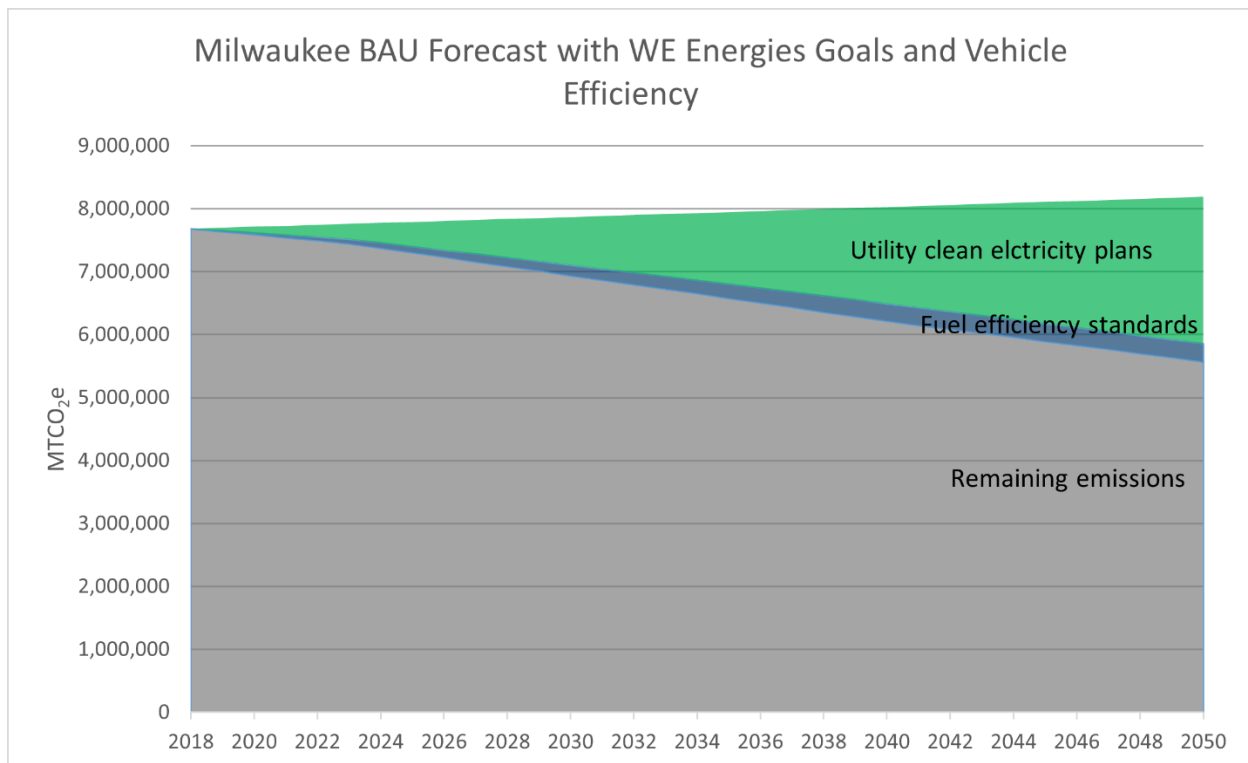


City of Milwaukee’s Greenhouse Gas Forecast & Planning Scenarios

The City of Milwaukee's most recent communitywide greenhouse gas (GHG) inventory includes emissions from activities and sources that took place within the City of Milwaukee during the 2018 calendar year. Using the 2018 GHG inventory as a baseline, ICLEI prepared a “business-as-usual” forecast and recommended potential reduction strategies.

Business-As-Usual (BAU) Forecast

The BAU forecast (pictured below) is a projection of emissions through the year 2050 based on estimated population growth¹, changes in fuel efficiency standards², and electricity grid decarbonization that is part of WE Energies "[Pathway to A Cleaner Energy Future](#)". The fuel efficiency standards and decreases in electricity grid carbon intensity explain why transportation and energy emissions decrease by 2050. However, of the remaining emissions, natural gas for thermal heating and industrial process and transportation internal combustion engine emissions continue to contribute large portions of emissions. As reported in Milwaukee’s Greenhouse Gas Inventory Report, a better understanding of the breakout of commercial and industrial sector natural gas and electricity related emissions will be critical to appropriately identifying potential emissions reductions from building electrification and energy efficiency.



¹ [Wisconsin State, County, and Municipal 2040 Population Projections](#)

² Based on the current Trump Administration Fuel standards established by the National Highway Traffic Safety Administration (Subject to change).

Potential Reduction Measures

The BAU forecast indicates that the most effective measures will be those that tackle both electricity/natural gas consumption and vehicle-miles-traveled (by gasoline and diesel vehicles). To inform the development of greenhouse gas reduction policies and programs in Milwaukee, a set of reduction measures focused on energy and transportation are presented. In both sectors, ICLEI recommends finding ways to reduce energy consumption first, and then incorporating low carbon energy supply.

Stationary Energy

The majority of emissions come from commercial/industrial energy (45%) and residential energy (31%) sectors. It is imperative to pursue mitigation strategies that address industrial and residential-specific buildings along with general mitigation strategies for all building types.

ICLEI suggests improving energy efficiency of all building types through a series of strategies. Energy Audits, specifically ASHRAE Level II mandatory audits for properties larger than 25,000 ft², help buildings identify EE opportunities and benchmark improvements. Buildings larger than 25,000 ft² should also be subject to specific retro-commissioning and lighting upgrade requirements. For the residential sector, weatherization is beneficial in reducing emissions, especially in cold climates.

In conjunction with energy efficiency improvements, it is helpful to establish energy benchmarking and disclosure programs. Benchmarking programs at the local level are an affordable means to help measure and compare energy performance, provide transparency, and maintain accountability.

Retrofit programs will help address residential energy efficiency. Establishing these programs through the local government will create the support necessary to spur residential momentum.

Improving, requiring, and enforcing energy codes for new and existing buildings is the best way to ensure that building owners are taking sufficient steps toward reducing emissions. Understanding that Codes are set at the state level, ICLEI still suggests advocating for updated building codes to match the most recent IECC Codes. Process improvements to the review and adoption of energy codes may help promote incorporating the energy efficiency benefits of updated codes. This assumes that all new buildings are subject to the most recent IECC upgrades and buildings with substantial renovations trigger IECC upgrades. It is also necessary to provide education while enforcing code compliance.

Other strategies to pursue are: establishing SmartRegs for rental properties to promote and require basic EE standards, improving codes gradually until net-zero (targeting net-zero for all new buildings), planning for natural gas thermal heating switching to low or no carbon fuels, institute a city-wide carbon user fee, and set goals to gradually increase renewable energy sources to 100%. This can include purchasing 100% Bundled Renewable Energy Credits to meet a small portion of the goal.

Transportation

The third-largest contributor to community-wide emissions is transportation (21%). Like any urban center, the majority of emissions come from on-road transportation. The following mitigation strategies represent fuel switching, mode-shift, or personal vehicle discouragement, all of which directly or indirectly reduce on-road transportation emissions.

Implementing a city-wide EV strategy is a critical step in reducing emissions, as well as sparking EV adoption. An EV strategy often consists of providing EV incentives to promote adoption, expanding EV charging infrastructure to support adoption, converting transit fleets and municipal fleets, and establishing EV charging building ordinances.

While it's imperative to convert on-road vehicles to cleaner fuel sources such as electricity, it's more essential to reduce personal vehicle use. Personal vehicle discouragement takes many forms, but some strategies are more appropriate for a city like Milwaukee. Parking changes such as dynamic or increased parking fees, or parking reutilization often encourage more efficient forms of transportation that focus on moving people and not just cars. Adjusting parking minimums/establishing maximum parking standards for new construction reduces investment in parking, which encourages more efficient transportation. Promoting Low Emissions Zones have proven effective in promoting clean air, reducing GHGs, and reducing congestion in designated areas. While not a first approach for small and medium cities, Road Pricing Schemes are also beneficial in limiting single occupant vehicle traffic. Large cities pursue this option in the form of congestion pricing, but cities similar to Milwaukee have utilized expressway/highway tolls. These tolls are often enforced during certain hours and in certain directions of travel.

Personal vehicle use is common for many cities, but as local economies struggle, deterring people from using their vehicles can produce inverse economic impacts. However, this issue can be resolved by providing robust transportation alternatives. Having abundant and efficient public transportation is essential and can be accomplished by supporting the SEWRPC's Vision 2050 plan. It is also imperative to pursue transit-oriented redevelopment. TORd encourages the construction of transit hubs and housing development around transit hubs, which not only promotes public transit use but reduces personal vehicle emissions as residents have improved access to public transit.

Along with public transit, promoting alternative mode shifts by establishing pedestrian zones in high pedestrian-traffic areas, increasing bike-share programs, and improving cycling access is extremely important in a medium-sized city like Milwaukee. When this alternative transportation is available, cycle and walk to work days are entertaining ways to promote further mode shifts.

Reducing GHG emissions is an urgent matter. It is best to begin moving toward an interim target that seems achievable under current conditions. Based on the BAU forecast, the 2030 joint city-county reduction target of 45% is feasible through a series of programs that utilize various recommended strategies. Longer term targets will require additional consideration of strategies

that favor a robust plan to decarbonize the electrical grid with an intentional shift to electrification of the thermal heating and transportation sectors. Over time, social and technological factors may enable reduction measures that are currently infeasible.

City Leading by Example

While Local Government Operations typically comprise a small portion of a community's overall GHG emissions, action within Milwaukee's operational control is an important step to demonstrate leadership and establish best practices. Milwaukee has been a partner in the Better Buildings Challenge since 2012, pledging to reduce the energy use of the City's building portfolio 20 percent by 2020. Additionally, the City has the opportunity to convert municipal streetlights over to LED from existing conventional streetlights. As energy efficiency takes hold within buildings and in streetlights, the City can also lead through additional renewable energy utilization - either directly or through utility scale offerings.

Appendix A- Resources

- I. Energy Efficiency
 - A. Commercial Energy benchmark and disclosure [Local Policies leveraging energy star benchmarking/reporting](#) (pg.4)
 - Perform and Improve EE
 - Energy Audits (ASHRAE Level II audit required for commercial and multifamily properties larger than 25,000 ft²)
 - [ASHRAE audit description](#)
 - [Case Studies](#) (pg. 25)
 - Retro-Commissioning (buildings greater than 25,000 ft²)
 - [Case Studies](#) (pg. 25)
 - Required lighting upgrades (existing buildings larger than 25,000 ft²)
 - Residential weatherization
 - [Weatherization for cold climates](#)
 - B. Residential Retrofit Program
 - FAS- [Residential Energy retrofits](#)
 - [ACEEE- Residential Energy Retrofits](#)
 - C. Improved codes and require updates to new and existing buildings (Update building codes to match most recent IECC codes)
 - Assumes that all new buildings are subject to most recent IECC upgrades and buildings with substantial renovations trigger IECC upgrades.
 - Enforced energy codes (Through increased education and enforcement buildings will maintain compliance with energy codes)
 - [DOE basics](#)
 - [Policy Guide](#)
 - [SmartRegs \(Boulder\)](#)
 - D. Net Zero New Home or new commercial via reduced permit fees
 - E. Green lease programs
 - [Green Leasing Guide](#)
 - F. Improving codes until net zero (All new buildings are subject to zero net energy (ZNE) codes)
- II. Statewide Energy Efficiency Resource Standard
 - A. [Wisconsin's current SEERS](#)
 - B. WE Energies DRER Contractual Program
 - C. Renewable Energy Growth
 - Supply 80%-100% of Milwaukee's electricity needs with renewable energy (Based on existing Utility models who have committed to 80% or more carbon free energy)
 - Goals to incrementally increase renewable energy sources
 - Purchase 100% renewable offsets

- III. Fuel Switching
 - A. Switch natural gas powered heating to heating powered by low- to no-carbon fuels
 - B. [Electrification](#)
- IV. Mechanisms for Financing and Funding Support
 - A. Carbon user fee
 - [Municipal carbon user fees](#)
- V. City Leading by Example
 - A. Full LED conversion of municipal streetlights
 - B. Achievement of 25% by 2025 renewable electricity goal (city facilities)
 - C. 20% energy efficiency gain in municipal buildings.

Appendix B- Transportation Resources

- I. Public Transit
 - A. Increase public transit ridership (in conjunction with SEWRPC 2050 Vision)
 - [SEWRPC 2050 Vision Forecasts](#) (Public transit vehicle miles)
 - B. Transit-oriented redevelopment (TOD)
 - [Implementing TOD](#)
- II. City-wide EV Strategy
 - A. EV Incentives
 - [Current state of EV incentives](#) (pg. 10)
 - [Driving EV Adoption](#)
 - B. Expanding infrastructure
 - [Current state of EV infrastructure](#) (pg. 5)
 - C. EV charging building ordinances
 - [Great Plains Institute- Best Practices](#)
 - [SWEEP](#)- (pg. 12)
 - [Seattle Ordinance](#)- adding requirements for EV charging infrastructure
 - [Salt Lake](#)- a mix of ordinances and Codes
 - [San Jose](#)- an ordinance to alter codes
 - [Peninsula Advanced Energy Community](#)- provides a list of draft ordinances utilized by cities in San Mateo County, CA
 - [International Code Council](#) (Yosomite, CA Chapter)- Draft for EV charging stations ordinance
 - D. Converting transit fleets
 - [Procuring EV Buses](#)
 - E. Converting municipal fleets
- III. Moving people efficiently
 - A. Personal Vehicle limitations
 - [Low Emissions Zones](#)
 - B. Parking Changes
 - [Assess actual parking needs](#)
 - Revising [parking minimums](#)
 - C. Maximum Vehicle Parking Standards
 - D. Road Pricing Schemes (Expressway/highway tolls)
 - [FHA- Case Studies](#) (Twin Cities)
- IV. Alternative mode shift
 - A. Increase Pedestrian Zones
 - [Achieving walkability/cyclability](#)
 - [Guide/tools to assessment/design](#)
 - B. Increase docked bike share programs
 - [Optimizing/planning bikeshare](#)
 - C. Improving cycling access

- [Denver Moves- Bikeway Designs](#)

D. Cycle to work programs/ walk/cycle days