AGENDA OF THE WATER COMMISSION

MONDAY, DECEMBER 11, 2023, 8:30 AM
In person at the Green Bay Water Utility.
631 S Adams St
Virtual attendance is also available via Zoom.

A. Zoom Meeting Information.

1. Join Zoom Meeting Online:
   https://zoom.us/j/98284055918?pwd=eHBxaWkvN1J2a3N0RERUWkRsNjVkUT09

   Or call in by phone: +1 312 626 6799
   Meeting ID: 982 8405 5918
   Passcode: 385002

   If you wish to speak at this public meeting or leave a comment, please fill out the online Comment Form prior to the meeting. More detailed Zoom Instructions can be found online.

B. Roll Call.

1. Roll call for the Water Commission Meeting of December 11, 2023.

C. Approval of the Agenda.

1. Approval of the Water Commission Meeting Agenda for December 11, 2023.

D. Approval of Minutes.

1. Approval of the Water Commission Meeting Minutes for November 13, 2023.

E. Regular Business.

1. Green Bay Water Utility Energy Plan and Executive Summary
2. Approval of 2024 Commission Dates
3. Election of Green Bay Water Commission Officers for 2024: President, Vice Presdent and Secretary-Treasurer

4. Approval Request for Government Pricing Contracts for Vehicle and Equipment Procurement

5. Approval of Final Payment in the amount of $12,211.50 to Fer-Pal Construction USA, LLC for contract "Green Bay Water Utility Water Main Rehabilitation."

6. Consideration to adjourn to CLOSED SESSION pursuant to Sec. 19.85(1)(g), Wis. Stats., for conferring with legal counsel for the governmental body who is rendering oral or written advice concerning strategy to be adopted by the body with respect to litigation in which it is or is likely to become involved; to-wit: Bodart Electric litigation.

F. Informational.

1. General Manager Update

2. Resolution in Recognition of Kathryn Hasselblad-Pascale

G. Adjournment.

1. Motion to adjourn the Water Commission meeting of December 11, 2023.

1) ACCESSIBILITY: Any person wishing to attend who requires special accommodation because of a disability, should contact the City Safety Manager at 920-448-3125 at least 48 hours before the scheduled meeting time so that arrangements can be made.
2) QUORUM: Please take notice that a majority or quorum of the Common Council may attend this Water Commission meeting and will constitute a meeting of the Common Council for purposes of discussion and information gathering relative to this agenda.
3) REPRESENTATION: The party requesting the communication, or their representative, should be present at this meeting.

MINUTES OF THE WATER COMMISSION

MONDAY, NOVEMBER 13, 2023, 8:30 AM
In person at the Green Bay Water Utility.
631 S Adams St
Virtual attendance is also available via Zoom.

A. ZOOM MEETING INFORMATION.

1. Join Zoom Meeting Online:
https://zoom.us/j/9828405918?pwd=eHBxaWkvN1J2a3N0RERUWkRsNjVkUT09

Or call in by phone: +1 312 626 6799
Meeting ID: 982 8405 5918
Passcode: 385002

If you wish to speak at this public meeting or leave a comment, please fill out the online Comment Form prior to the meeting. More detailed Zoom Instructions can be found online.

B. ROLL CALL.

1. Roll call for the Water Commission Meeting of November 13, 2023.

On Monday, November 13, 2023, the Water Commission met in person and virtually via Zoom. President Heugel called the meeting to order at 8:30 a.m. Recording Secretary Beilke called the roll. Seven voting commission members: President John Heugel (In Person), Vice President Jamie Wall (Virtually via Zoom), Secretary-Treasurer Tom Karmen (In Person), Kathryn Hasselblad-Pascale (Virtually via Zoom), Elizabeth Wheat (In Person), Al Farvour (Virtually via Zoom), and Jacque Boyle joined at 8:35 during item E2 (Virtually via Zoom).
Also present: Alder Craig Stevens (In person, non-voting), Council Representative to the Water Commission, Attorney William Vande Castle (Virtually via Zoom), Mark Kapocius (Virtually via Zoom) from von Briesen & Roper, City Attorney Joanne Bungert and Lynn Gerlach.
Staff present: Nancy Quirk, Brian Powell, Andrea Hay, Stephanie Rogers, Karen Smits, Sarah Fidler, Russ Hardwick, Jason Maes, Jonathan Peters, Kristin Romanowicz, Justin Hewitt and Peter Falish.

C. APPROVAL OF THE AGENDA.

1. Approval of the Water Commission Meeting Agenda for November 13, 2023.

Moved by Thomas Karman, seconded by Kathryn Hasselblad-Pascale to move item E7, Closed Session, to after F1, the General Manager's Update and approve. Voice vote being had, the motion passed unanimously.

D. APPROVAL OF MINUTES.

1. Approval of the Water Commission Meeting Minutes for October 9, 2023.

Moved by Kathryn Hasselblad-Pascale, seconded by Allen Farvour to approve. Voice vote being had, the motion passed unanimously.

E. REGULAR BUSINESS.

1. Introduction of new Equipment Maintenance Technician, Peter Falish.

New employee Peter Falish was welcomed by President John Heugel and the Water Commission.

2. Approval of the Employee Handbook updates.

Moved by Kathryn Hasselblad-Pascale, seconded by Jamie Wall to approve and become effective starting December 17, 2023. Voice vote being had, the motion passed unanimously.

3. Approval of Request for Reclassification of Two Positions.

Moved by Kathryn Hasselblad-Pascale, seconded by Jamie Wall to approve to reclassify the Communications Director and Water Quality Coordinator positions. Voice vote being had, the motion passed unanimously.

4. Approval & Adoption of Resolution for the 2024 Annual Budget

Moved by Thomas Karman, seconded by Jamie Wall to approve and adopt the resolution of the 2024 Annual Budget as presented. Voice vote being had, the motion passed unanimously.

5. September and October 2023 Financial Reports

Business Manager Rogers presented the Water Utility's September 2023 and October 2023 financials and cash position. All were within expectations. No substantive issue of concern was identified. Moved by Thomas Karman, seconded by Allen Farvour to approve as presented. Voice vote being had, the motion passed unanimously.

6. Approval of Recommendation to Repeal and Recreate Section 42-164 to 42-174, Green Bay Municipal Code, Relating to Lead Water Service Line Replacement.

Moved by Jamie Wall, seconded by Kathryn Hasselblad-Pascale to recommend to the Common Council to approve the proposed changes to the Green Bay Municipal Code. Voice vote being had, the motion passed unanimously.

7. Consideration to adjourn to CLOSED SESSION pursuant to Sec. 19.85(1)(g), Wis. Stats., for conferring with legal counsel for the governmental body who is rendering oral or written advice concerning strategy to be adopted by the body with respect to litigation in which it is or is likely to become involved; to-wit: PFAS litigation.

Moved by Jacque Boyle, seconded by Kathryn Hasselblad-Pascale to enter closed session pursuant to Sec. 19.85(1)(g), Wis. Stats and expressly quoting notice of closed session. Roll call was taken: John Heugel - yes. Jamie Wall - yes. Tom Karmen - yes. Kathryn Hasselblad-Pascale - yes. Al Farvour - yes. Elizabeth Wheat - yes. Jacque Boyle - yes. Roll call vote passed unanimously.

Moved by Jamie Wall, seconded by Jacque Boyle to return to regular session. Roll call was taken: John Heugel - yes. Jamie Wall - yes. Tom Karmen - yes. Kathryn Hasselblad-Pascale - yes. Elizabeth Wheat - yes. Al Farvour - yes. Jacque Boyle - yes. Roll call vote passed unanimously.

F. INFORMATIONAL.

1. General Manager Update

General Manager Quirk presented her report on the following:

1. Operations Projects
    a. Update ot Master Plan
    b. Generator Addition to Lake Station
    c. Surge Analysis of Raw Water Lines
2. Business Office/IT
    a. Phone System Upgrade for 2024
    b. Tax Roll for Unpaid Water Bills
3. Filter Plant
    a. Sludge Lagoon Dredging
    b. Reservoir Inspection
    c. Ozone Generator Repair
4. Energy Efficiency Study Report
5. Workforce Report
    a. Open Positions
        i. Distribution Maintenance Person (Full-Time)
        ii. Operations Manager (Full-Time)

G. ADJOURNMENT.

1. Motion to adjourn the Water Commission meeting of November 13, 2023.

Moved by Thomas Karman, seconded by Allen Farvour to adjourn. Voice vote being had, the motion passed unanimously. The meeting adjourned at 9:34 a.m.

Green Bay Water Commission
MEMORANDUM

DATE: **December 11th, 2023**
TO: **Green Bay Water Commission**
FROM: **Brian Powell, General Manager of Green Bay Water; Maddie Koolbeck and Dan Streit, Senior Researchers at Slipstream**
RE: **Presentation of Green Bay Water Energy Plan by Slipstream**

In the previous year, the City of Green Bay and Green Bay Water engaged Slipstream, a consultant specializing in energy efficiency and renewable energy, to analyze our energy usage. This collaboration has enhanced our understanding of current energy consumption and identified opportunities for improvement. Our aim is to elevate energy efficiency, demonstrating our commitment to sustainability and leadership in environmental stewardship in our community.

Senior Researchers Maddie Koolbeck and Dan Streit from Slipstream will lead the presentation for the Water Commission. They will provide baseline data, share analysis insights, and propose recommendations tailored to our specific needs and goals. Their input will contribute to the future of Green Bay Water's energy management and sustainability initiatives.

The Green Bay Water Energy Plan is designed to improve our operational efficiency and support the environmental goals of our community. This plan aligns with the City's resolution for 100% clean energy and carbon neutrality by 2050. The proposal for Green Bay City-Wide Comprehensive Energy Planning submitted to the Public Service Commission of Wisconsin's Office of Energy Innovation is a critical step towards these objectives. We are committed to creating a comprehensive energy plan that involves both businesses and community members, moving towards our goals in a cost-effective and strategic way.

Green Bay Water Utility Energy Report

October 2023

GREEN BAY WATER

EXECUTIVE SUMMARY

Energy is the second highest cost for the Green Bay Water Utility, making energy efficiency and energy strategies a top priority. To pursue savings, the Water Utility has addressed energy in a variety of ways, including satellite tracking project to identify any leaks to limit the amount of water lost in the distribution system, working with Focus on Energy to implement energy efficiency upgrades at many of its facilities, and conducting a pump study to identify ways to save energy.

To continue efforts and identify additional opportunities, the Water Utility partnered with Green Bay Metro Transit and City of Green Bay to complete an energy plan process. The team was awarded a planning grant through the Office of Energy Innovation (OEI) at the Wisconsin Public Service Commission (PSC) in August 2022. Over the past year, the three partners have worked with Slipstream, a nonprofit organization, to develop an energy plan with near-term energy opportunities. The Water Utulity engaged with the creation of the communitywide Clean Energy Green Bay plan and worked with Slipstream to identify more specific opportunities for the Water Utility on fleet and solar. The process included the following steps:

- Analysis of all fleet and facility energy use data to develop a baseline energy, cost and carbon profile
- Compilation of a current vehicle list along with gasoline and diesel purchases to identify electric vehicle options for the Water Utility fleet
- Analysis of onsite solar opportunities at select Water Utility facilities with adequate space.

Creating a greenhouse gas profile is a vital first step in a planning process. The profile allows for identification of savings opportunities and serves as a baseline to use when tracking future progress. Figure 1 illustrates the relative CO_2 impact of Water Utility facilities and vehicles.

Figure 1. Relative CO_2 impact of Water Utility facilities, buildings, and vehicles

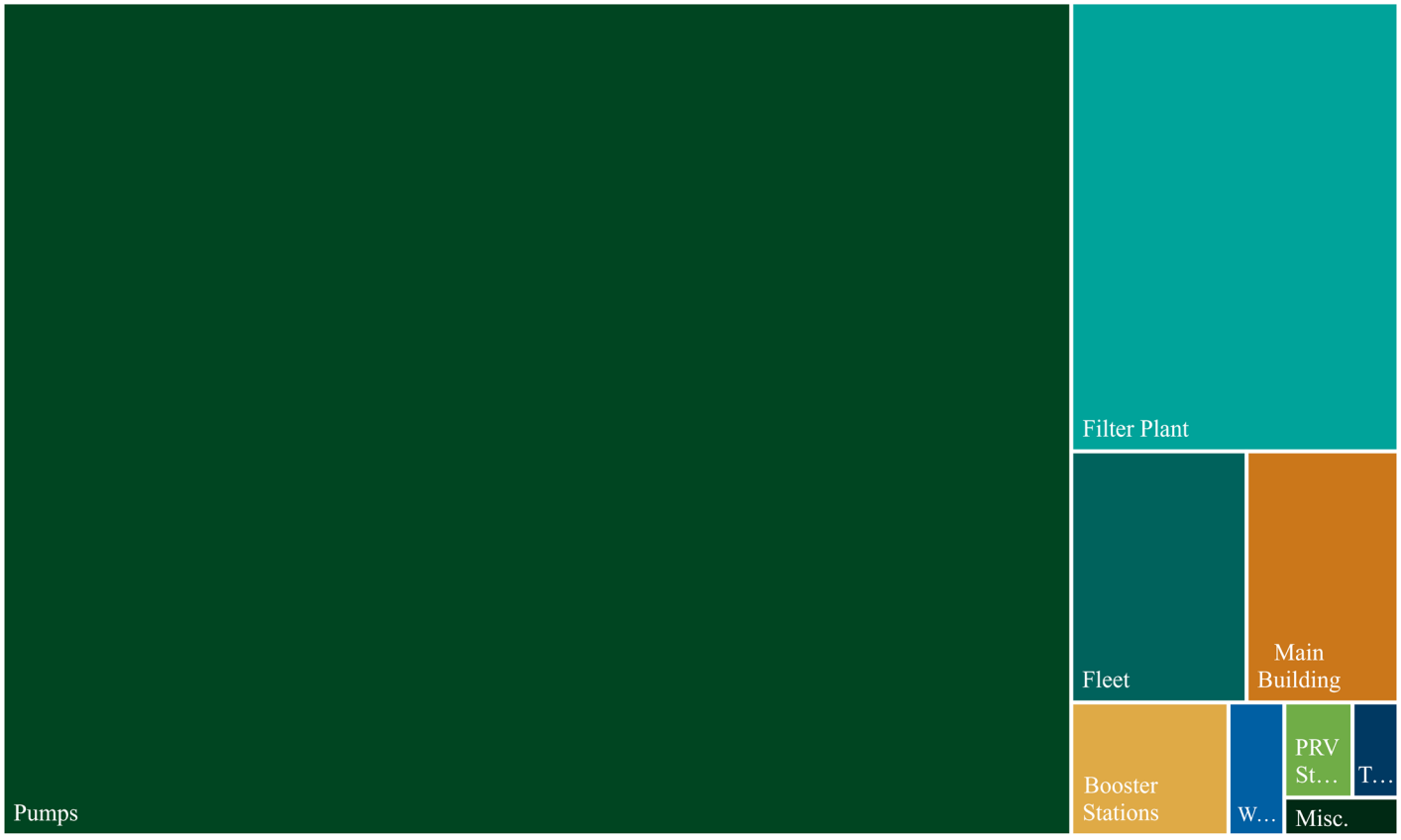


Table 1 illustrates the CO_2 emissions and energy costs for each major source of energy. The pumps are the most significant source of CO_2 emissions and cost followed by the Filter Plant.

Table 1. Water Utility CO_2 emissions and cost data (2021)

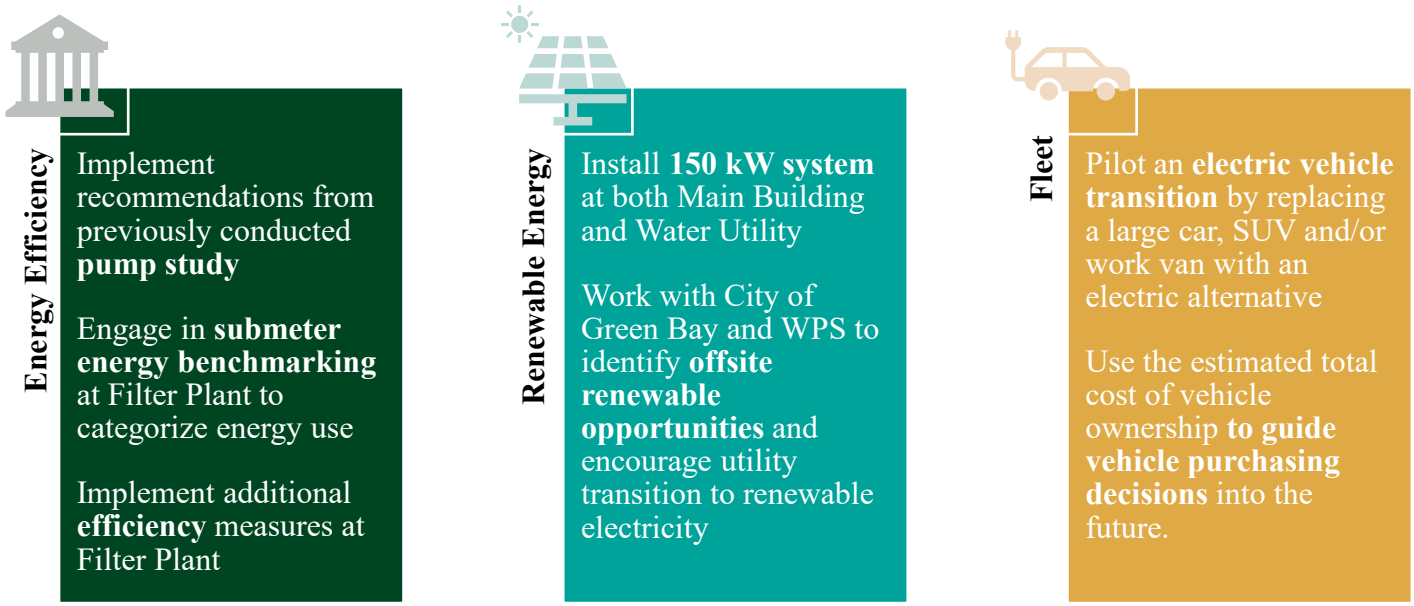
Source	Carbon Emissions (metric tons)	Cost
Pumps	7,444	$725,815
Filter Plant	1,229	$150,895
Fleet	368	$160,795
Wells	62	$23,810
Main Building	319	$38,265
Booster Stations	175	$39,660
PRV Stations	54	$14,265
Tanks	37	$8,035
Misc.	36	$12,215
Total	**9,723**	**$1,173,755**

Figure 1 summarizes the recommendations for Water Utility operations. The Water Utility has already implemented several energy efficiency strategies in its facilities, and conducted a large pump study separate from this project to identify savings. The recommendations encourage implementation of measures identified in that study and more granular submetering of facilities.

The renewable energy recommendations focus on cost-effective installations at facilities with adequate space available, and collaboration with the City and WPS for offsite renewable options. The onsite arrays have the ability to replace 60% and 10% of electricity at the Main Building and Filter Plant, respectively.

The fleet recommendations focus on an initial conversion of a few Water Utility vehicles, such as SUVs and large cars. The pilot can then inform a gradual transition to EVs as alternatives are available and cost-effective. At this time, cars, SUVs, small pickups, or work vans have cost-effective EV alternatives. Heavy-duty vehicles do not have feasible and cost-effective alternatives. The transition to these vehicles can generate 22% - 47% savings in CO_2 emissions and 53% - 62% operational cost savings per vehicle.

Figure 2. Overview of Water Utility recommendations



INTRODUCTION

Energy is the second highest cost for the Green Bay Water Utility, making energy efficiency a top priority. To pursue cost savings, the Water Utility has implemented several energy-saving initiatives over the last several years. The Water Utility completed a satellite tracking project to identify any leaks to limit the amount of water lost in the distribution system, worked with Focus on Energy to implement energy efficiency upgrades at many of its facilities, and conducted a pump study to identify ways to save energy. In construction of the new Water Utility office building, the Water Utility also implemented energy efficient design items.

To continue efforts and identify additional opportunities, the Water Utility partnered with Green Bay Metro Transit and City of Green Bay to pursue an energy planning grant. The team was awarded a planning grant through the Office of Energy Innovation (OEI) at the Wisconsin Public Service Commission (PSC) in August 2022.

Over the past year, the three partners have worked with Slipstream, a nonprofit organization, to develop an energy plan with near-term energy opportunities. The Water Utility partnered with the team on the creation of the communitywide Clean Energy Green Bay plan and worked with Slipstream to identify more specific opportunities for the Water Utility. The process included the following steps:

- Analysis of all fleet and facility energy use data to develop a baseline energy, cost and carbon profile
- Compilation of a current vehicle list along with gasoline and diesel purchases to identify electric vehicle options for the Water Utility fleet
- Analysis of onsite solar opportunities at select Water Utility facilities with adequate roof or ground space.

Robust community engagement informed the development of recommendations for near-terms and medium-term actions. Community engagement included surveys of Green Bay residents and businesses, collaboration with community-based organizations, hosting community forums, and online feedback forms.

The main recommendations from this process include:

- Install solar on the Main Building and Filter Plant and explore other renewable electricity opportunities
- Pilot a light-duty electric vehicle, such as a SUV or large car, in the next two years. Use performance data from the pilot to identify the pathway for a gradual transition to EVs as more models are available and upfront costs decline.
- Continue to conduct pump studies and other in-depth energy efficiency audits and implement recommended changes from studies.

The report starts with an overview of baseline data and then provides an overview of the solar recommendations, fleet recommendations, and facility recommendations. It concludes with an overview of funding sources available to the Water Utility.

Baseline Data

Table 2 illustrates the CO_2 emissions and energy costs for each major source of energy. The pumps are the most significant source of CO_2 emissions and cost followed by the filter plant.

Table 2. Water Utility CO_2 emissions and cost data (2021)

Source	Carbon Emissions (metric tons)	Cost
Pumps	7,444	$725,815
Filter Plant	1,229	$150,895
Fleet	368	$160,795
Wells	62	$23,810
Main Building	319	$38,265
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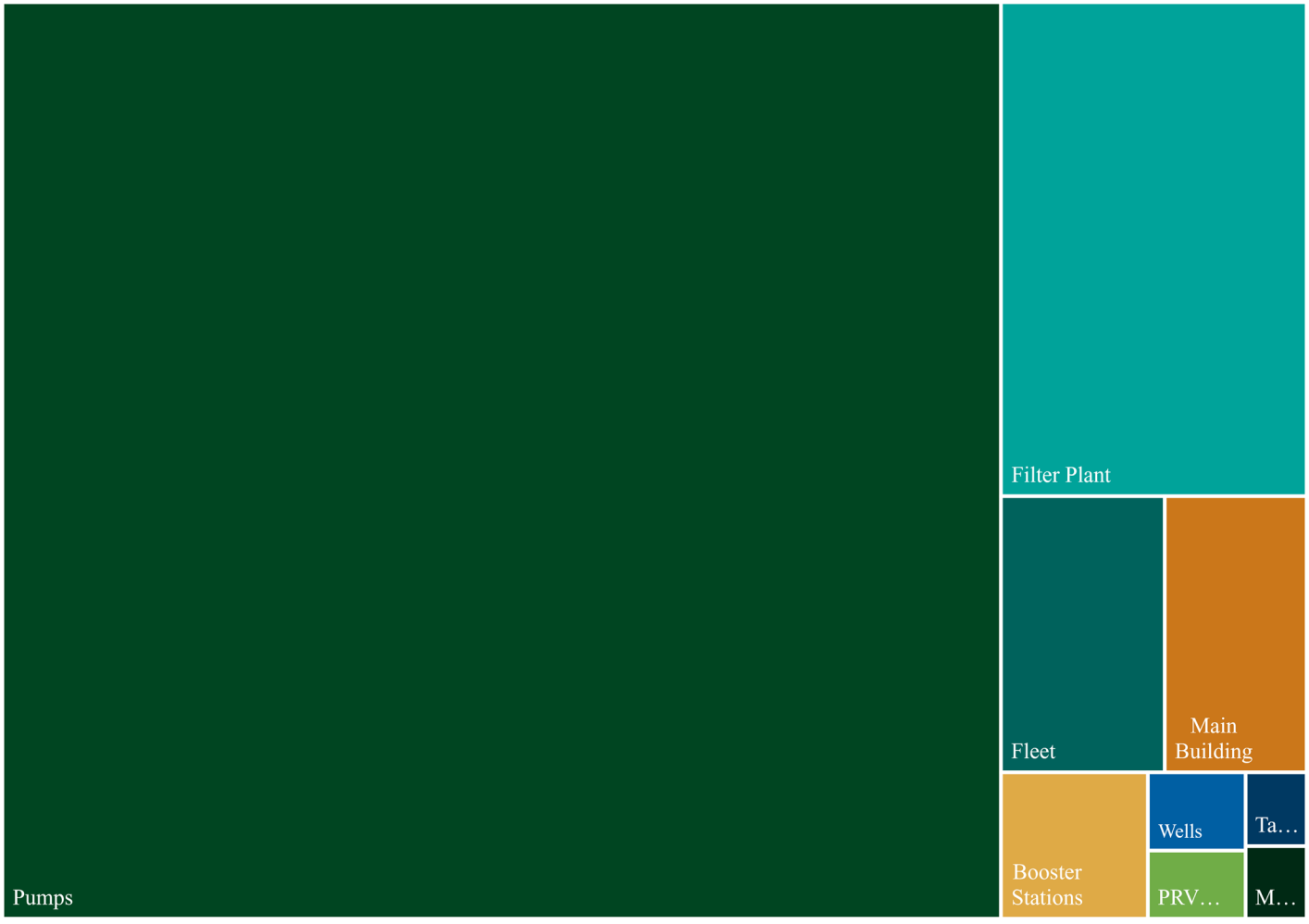
PRV Stations	54	$14,265
Tanks	37	$8,035
Misc.	36	$12,215
Total	**9,723**	**$1,173,755**

Figure 3 illustrates the relative CO_2 impact of Water Utility facilities and vehicles. The pumps contribute the largest portion of emissions, which relates to the constant energy needed to draw and pump water.

Figure 3. Relative CO_2 impact of Water Utility facilities, buildings, and vehicles



ENERGY SAVING OPPORTUNITIES

Facilities

The Water Utility has already implemented several energy efficiency initiatives across the facilities. In 2021, the Water Utility renovated its main office building and implemented several energy efficiency design items.

Recognizing the large impact that pumps have on total energy use, the Water Utility initiated a pump efficiency study. We recommend the Water Utility prioritize implementing any recommendations from that study to lower the energy, cost and CO_2 impact from pumps.

Filter Plant

As the Water Utility was undergoing a comprehensive pump study, the team primarily focused on efficiency opportunities for the Filter Plant. The recommendations below provide high-level opportunities for potential savings at the Filter Plant:

- **Install equipment for granular monitoring of equipment.** The filter plant is a large complex with multiple important water treatment processes than run year-round. To fully understand current energy use and understand efficiency opportunities, more granular benchmarking of processes is needed. This includes installing submeters or energy monitors on specific pieces of equipment to better track energy use. This will allow the staff to better track energy use from different equipment and processes and compare that to industry standards.
- **Replace the remainder of the lights with LEDs**. The Filter Plant has transitioned roughly 75% of interior lights and none of the exterior lights to LEDs. A full transition will lead to additional savings for the facility. Focus on Energy has incentives for LED replacements.
- **Work with a contractor to identify ways to add better occupancy controls for both lights and HVAC.** As a facility that requires a constant presence, occupancy sensors and controls for lighting could generate electricity savings by ensuring that lights are only on when someone is in that part of the facility. Similarly, occupancy sensors for HVAC could help lower heating costs by only heating sections of the facility with occupants rather than heating the whole facility all the time.
- **Explore potential for steam trap incentives.** The Filter Plant currently uses internal staff to examine and repair their steam traps as needed. Focus on Energy offers incentives for each steam trap examined and any leaky trap repaired. The Water Utility should explore how to leverage those rebates for its existing practices.
- **Work with Focus on Energy to identify rebates for efficiency updates.** The Filter Plant mentioned having VFDs on many pieces of equipment. However, there were some pumps and other pieces of equipment that did not have VFDs. The Filter Plant should identify if there are other opportunities for adding VFDs to improve efficiency and lower energy use.
- **Consider high efficiency heating at replacement:** When the current boilers reach replacement, the Filter Plant should consider high efficiency heating equipment and discuss with a contractor the options for electrification.

Focus on Energy has a water treatment best practice guide that may provide additional guidance on next steps for reducing energy use within the Filter Plant.[1]

[1] Water and Wastewater Treatment Industry. February 2020. https://assets.focusonenergy.com/production/inline-files/2021/BIZ-EE-Best_Practices-Water_Wastewater.pdf

Solar

Onsite Solar Opportunities

The project team identified solar opportunities by reviewing energy use profiles and roof space available by building. The Green Bay Water Utility owns multiple facilities – however most of the facilities have limited roof space and the ground space around the facilities needs to have easy access for various pieces of equipment. This limited the main analysis to the Water Utility Main Building and the Filter Plant.

The satellite imaging provides the direction the roof faces and degree tilt. South-facing arrays generally offer the most cost-effective opportunities for installing solar arrays, followed by east or west facing arrays. The degree tilt represents how angled the panels are on the roof. On average, matching the degrees of tilt for the panels to the degrees latitude of the solar array will produce the most electricity. If a building's roof is not tilted at this angle, panel mounting can apply a tilt; however the tilt must be balanced against shading effects created between rows of panels.

The roof space available was combined with hourly energy data and utility bill rates and entered into a technoeconomic tool, ReOpt, to find the most cost-effective solution. ReOpt takes inputs of a building's energy loads, utility rate, and based on inputs and constraints from the user optimizes the sizing of solar PV.

The analysis assumes that the net metering limit is 20 kW dC. This is the current limit set by Wisconsin Public Service and any solar installation below this size receives the full utility retail rate (the same as what is paid) for any overproduction of solar that is sent back to the grid.[2] Any solar size above 20 kW dC receives the buyback rate (or wholesale rate) instead. The buyback rate is lower than the retail rate and changes yearly. Both rates are only applicable when the amount of solar produced at a certain time is higher than the building's consumption. The remainder of the time the solar production is saving money as no energy must be purchased from the grid.

Other assumptions include:

- The lifetime of the system is 25 years. This is a conservative estimate with estimates ranging from 25 to 50 years.
- The upfront cost of the system is $2,500/kW for systems below 50 kW, $2,200/kW for systems between 50 and 100 kW and around $2,000 for systems larger than 100 kW.
- Roof loading and electrical panel space needs to be verified by a trained design professional.
- Operations and maintenance costs are low per year. Inverters need to be replaced at year 15.

Table 3 includes a definition for each output shared for the buildings.

Table 3. Solar output definitions

Output	Definition
System Size	Total solar photovoltaics size in kW dc.
Payback (years)	Calculated as total upfront cost (after incentives) divided by first year cost savings.
Percent Renewable Electricity	Total electricity produced divided by total energy consumption
Lifetime CO_2 Savings (metric tons)	Avoided grid electricity use multiplied by a grid hourly emissions factor
Lifetime Energy Savings	Total energy bill savings over the lifetime of the solar panels (25-years).
Total Upfront Cost	Total initial upfront cost ($2500/kW multiplied by system size)
Focus on Energy Incentives	Focus on Energy Business rebates[3]
IRA Tax Credit	30% direct pay through Inflation Reduction Act.
Total Cost	Total initial upfront cost minus rebates and tax incentives

[2] There are currently Wisconsin Public Service Commission cases that are considering the requirement for utilities to offer net metering in the future. The cases have not been decided and each utility would then need to submit their own request for new rates. If that occurs, the payback period and annual energy savings may change slightly but other results will be constant.

[3] Solar rebates are here: https://assets.focusonenergy.com/production/inline-files/2023/RR-Solar-PV-APL.pdf

We recommend the Water Utility start with Water Utility Main Building and the Water Utility Filter Plant, and continue to consider if any other facilities are feasible for renewable energy installations.

Water Utility Main Building

Available roof space: 15,700 square feet available

Utility rates: Flat rate

Wholesale (buyback) energy rate: $0.0472 in off-peak; $0.05575/kWh in summer on-peak; $0.05168 in winter off-peak

Orientation: Southwest facing

Annual energy use: ~297,000 kWh

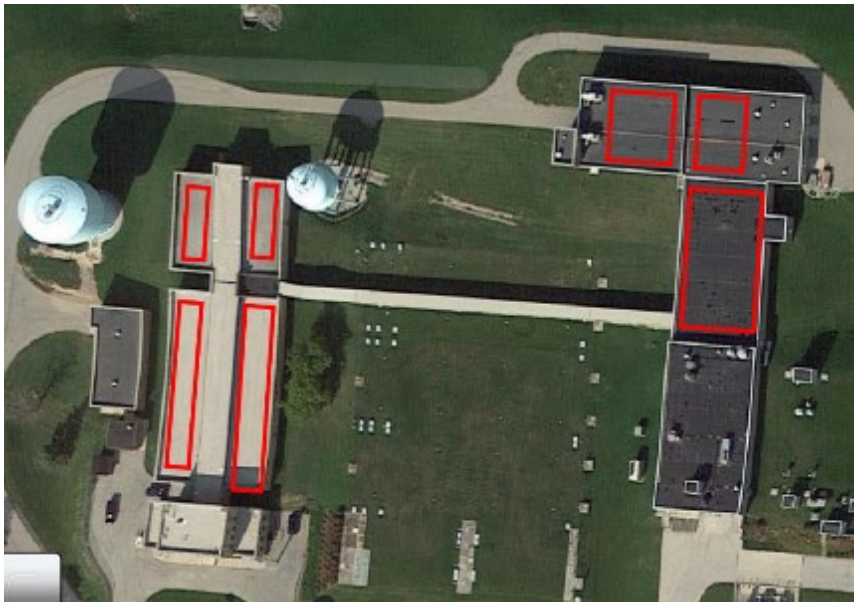
Solar Cost: $2,000/kW for larger array; $2,500/kW for smaller array

Table 4 presents two options for the Water Utility. The larger array maximizes the space available on the building's roof while the smaller version minimizes cost. The recommendation is to eventually install the total 157 kW but to start with the 50 kW system if budget constraints prohibit installation of the larger system. The Water Utility could then add more panels in subsequent years as budget allows.

Table 4. Water Utility Main Building two potential solar arrays

Metric	Optimized Solution	50-kW Constraint
System Size	157	50
Payback (years)	11.3	14.3
Percent Renewable Electricity	63%	20%
Lifetime Carbon Savings (metric tons)	3,010	958
Total Energy Savings	$440,661	$141,240
Total Upfront Cost	$314,220	$125,000
Focus on Energy Incentives	($20,139)	($6,750)
IRA Tax Credit	($94,266)	($37,500)
Total Cost	$199,815	$80,750

Water Utility Filter Plant



Available roof space: 15,000 square feet available

Utility rates: Time of use rate - $0.04569/kWh in off-peak; $0.07767/kwh in on-peak

Wholesale (buyback) energy rate: $0.0472 in off-peak; $0.05575/kWh in summer on-peak; $0.05168 in winter off-peak

Orientation: South-facing with 20-degree tilt

Annual energy use: ~1,493,900 kWh

Solar Cost: $2,000/kW

Table 5 presents the optimized solar option for the Water Utility Filter Plant. The Filter Plant is on a time-of-use rate with lower energy rates per kWh. This lowers the energy cost savings per kWh of solar electricity produced and leads to a higher payback period than most of the other buildings. For that reason, we'd recommend the water utility start with the main building and then consider the solar opportunities at the Filter Plant.

Table 5. Water Utility Filter Plant recommended solar arrays

Metric	System Information
System Size (kW-DC)	150
Payback (years)	16.2
Percent Renewable Electricity	12%
Lifetime Carbon Savings (metric tons)	3,399
Total Energy Savings	$294,810
Total Upfront Cost	$300,000
Focus on Energy Incentives	($19,250)
IRA Tax Credit	($90,000)
Total Cost	$190,750

Offsite Options

The City's Clean Energy Green Bay plan has a recommendation to reach 40% renewable electricity by 2030 and 100% renewable electricity by 2050. As the City works on this goal, we recommend the Water Utility continue to serve as a partner to the City in conversations with WPS. This collaboration, and the resulting increase in renewable electricity on the grid, will help the Water Utility more substantially reduce CO_2 emissions.

Additionally, the Water Utility could also collaborate with the City on discussions with WPS about off-site renewable energy opportunities, and work to add more renewable electricity in that way. WPS recently received approval to implement a Renewable Energy Pathways pilot,[4] which allows customers to subscribe to a portion of a utility-scale renewable energy generating facility and then pay the cost for the resource minus a credit for the energy value of the resource.

[4]Full program application and details available online: https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=472698;

Fleet

The Green Bay Water Utility operates roughly 55 vehicles and pieces of equipment to support providing clean water to Green Bay residents and businesses. The combined annual cost for fuel for these vehicles exceeds $135,000 and fuel combusted to power the vehicles emits over 310 metric tons of CO_2 per year with off-road equipment contributing another 55 metric tons of CO_2 per year. The vehicle types include large cars, compact pickups, heavy-duty pickups, SUVs, work vans, and large trucks.

Figure 4 illustrates the cost and carbon impact of each vehicle type for the Water Utility fleet. Both cost and carbon baseline numbers are based on the amount and type of fuel used, so the percentages are the same for both fuel cost and CO_2 emissions. The vehicle types in blue (large cars, SUVs, and work vans) are the vehicle types with identified EV alternatives. While there is not a cost-competitive EV option to replace compact pickup trucks, the category is shown in blue because we recommend a hybrid option for these vehicles.

At this point, there are not cost-competitive alternatives for the heavy-duty vehicles that are responsible for most of the Water Utility's fuel costs and emissions. There are only a few emerging models for these vehicle types. For those models, the incremental cost is often a barrier and there is limited data on performance.

Figure 4. Cost and carbon impact by vehicle category (2021 data)

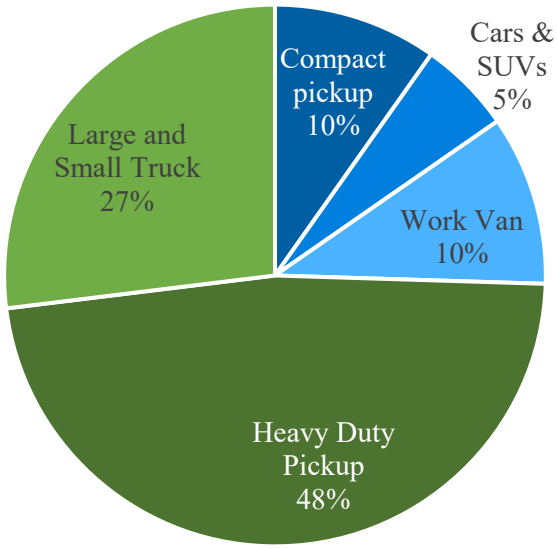


Table 6 shows miles per gallon fuel economy for each vehicle type in the current Water Utility fleet.

Table 6. Water Utility fleet miles per gallon by vehicle type

Vehicle category	Avg. MPG
Large Car	20.4
Compact Pickup	13.9
Small SUV	25.0
Mid-size SUV	16.3
Work Van	10.4
Heavy-Duty Pickup	7.3
Large Truck	4.1

The project team started by reviewing available EVs to determine which vehicle categories have market-ready EV alternatives, and then calculating incremental cost and payback periods to identify which categories are feasible for adoption in the near-term. More details on this analysis methodology are available in Appendix A.

Table 7 shows examples of current Water Utility vehicles in each light duty category, as well as examples of alternative electric and hybrid models. The new gasoline vehicle benchmark lists the approximate cost and fuel efficiency rating for a new conventional vehicle in the same category. The EV incremental cost is the difference between the cost of the new conventional vehicle and the cost of the corresponding efficient or electric vehicle. It includes the expected reduction in cost from the Commercial Clean Vehicle Tax Credit (up to $7,500), which the Inflation Reduction made available to local governments, for each vehicle.[5] The cost savings per mile is the reduced per mile cost of fueling and maintaining the EV instead of the conventional vehicle. Miles for financial payback indicates the number of miles after which the cumulative benefit of the lower cost of driving the EV would surpass the higher cost (if any) of purchasing the EV.

Table 7. Water Utility Efficiency and EV Alternative Analysis

Category	Current Vehicle	New gasoline vehicle benchmark	Ex. EV Alternative	EV Incremental Cost	Cost Savings/Mile	Miles for Financial Payback
Large Car	Chevrolet Impala	31 mpg $31,000	Chevrolet Bolt EUV	$0	$0.093	0
Compact Pickup	Chevrolet Colorado	23 mpg $29,200	Ford Maverick Hybrid*	$0	$0.050	0
Small SUV	Chevrolet Equinox	29 mpg $32,428	Hyundai Kona	$2,500	$0.102	24,000
Mid-size SUV	Dodge Journey	21 mpg $36,800	Hyundai Ioniq 5	$8,500	$0.137	62,000
Work van	Chevrolet G2500 Express	25.5 mpg $44,500	Ford E-Transit	$3,600	$0.093	36,200

*No cost-effective EV is now available in this category. The proposed vehicle is a standard hybrid, which is more fuel efficient and has lower cost than the conventional alternative.

The Water Utility has one or more large cars, compact pickups, small SUVs, and work vans that are 10 or more years old, and which may be ready for replacement in the near term. The utility may most cost-effectively add EVs to its fleet by adding vehicles through regular replacement cycles. Therefore, we recommend that the water utility start its transition to EVs by replacing a large car, two existing work vans, and/or a small SUV with alternative electric models. The team specifically recommends starting with a vehicle that drives a standard number of miles in a day and parks the same place each evening, such as the vehicle that goes to the Filter Plant and back each day.

Replacement of the pilot vehicles could lead to 22% - 47% savings in CO_2 emissions and 53% - 62% operational cost savings per vehicle. Savings ranges are based on relative performance of electric and gasoline vehicles between vehicle categories.

We also recommend that the utility consider replacing its aging compact pickups with hybrid models as these vehicles reach replacement age. The conventional hybrid models will marginally reduce fuel costs and emissions while requiring no investment in charging infrastructure and no additional training for drivers or maintenance staff.

[5] The value of any available Federal tax credits are applied to the EV MSRP to calculate the EV incremental cost.

As other vehicles reach replacement age, we recommend transitioning them to EVs. We recommend that the Water Utility compare total cost of ownership (TCO) to inform these purchases. This analysis combined with performance requirements for the vehicle should inform each vehicle replacement decision. This approach will ensure that future decisions about fleet transitions reflect the changing costs of EVs vs ICEs and the long-term operational cost savings potential of EVs. The analysis should incorporate the following components:

- Upfront cost differential
- Ongoing fuel costs: cost to charge an EV vs. cost to purchase gasoline or diesel needed for an ICE
- Maintenance costs
- Forecasted resale values of both vehicles

Table 8 shows the potential savings from replacing all Water Utility vehicles in the applicable categories with electric or hybrid models. Currently, there are not cost-effective electric models for most medium- and heavy-duty vehicle types, which are used by the utility. As EV technology and the EV market continue to progress, we anticipate that cost-competitive electric vehicle options will emerge soon for additional vehicle categories. We recommend that the utility continue to monitor the market to identify new EV opportunities.

Additionally, as the City transitions to a higher percent renewable electricity, these emissions savings will continue to increase for each vehicle.

Table 8. Estimated Water Utility annual savings for full light duty EV transition

Vehicle category	Operating Cost Savings	CO_2 Emissions Savings (metric tons)
Large Car	$589	0.7
Compact Pickup	$4,368	7.0
Small SUV	$3,006	4.0
Mid-size SUV	$1,239	2.0
Work van	$3,698	2.8
Total	**$12,900**	**16.5**

Charging Infrastructure

The utility will need to install an adequate number of level 2 charging stations to support the three EVs in the pilot phase. Level 2 charging stations require 240V electric service and can fully charge a light-duty vehicle in 4-10 hours, depending on the battery capacity of the vehicle. Level 1 chargers use standard 120V electric service, but are unable to fully recharge a battery overnight, while Level 3 chargers can fully recharge a vehicle in less than 30 minutes but are much more expensive than Level 2 chargers.

Table 9 summarizes the three levels of EV charging stations. The costs listed in Table 9 show typical ranges for the combined cost of the station hardware, electrical upgrades and electrician labor to install each EV charging port.

The hardware cost for Level 2 charging stations is modest; however, installing conduit between existing electrical panels and the location of the charging station and upgrading electrical service (if necessary) can add complexity and expense to installing the stations. Due to the wide variation in the costs of installing the high voltage electrical service required for Level 3 stations, the cost listed for Level 3 stations only represents the material expenses.

Table 9. EV Charging Station Types

Charger type	Range Miles per charging hour	Uses	Installed cost per port (est.)
Level 1 (120V AC)	~5	Home charging	~$1,200 - $1,500
Level 2 (240V AC)	~25	Home, workplace, and public charging (most common)	~$1,500 - $4,200
Level 3 (DC)	200+	Public charging; transportation corridors	~$20,000 - $150,000 (Hardware only)

Based on the number of miles driven annually by most vehicles, if all three vehicles will be primarily parked at the Water Utility's main building, the utility should start by installing 2-3 charging ports at the main building to support these vehicles. The two oldest work vans are driven 5,000 – 6,000 miles annually. The range per charge of one of the leading electric models of electric work van is 116 miles. Depending on the likelihood of the two vans having concurrent high mileage days, the utility may plan for installing one port per van, or it may determine that one port could support both vehicles. (Note. A driving range of 116 miles is considerably lower than typical ranges for most light duty EVs.) The small SUV that is recommended for the pilot is driven over 24,000 miles per year; however, small SUV EVs can drive 200 – 250 miles between charges. If the small SUV is expected to regularly have mileage days, it may be beneficial for the utility to install a port dedicated for this vehicle. As the utility adds charging infrastructure for initial vehicles, we recommend consideration of:

- Assess total future electrical service needs when upgrading for new vehicle charging stations. When planning for any electrical service upgrades or laying of new conduit, assess total potential electric vehicles that may be stationed at the location and the corresponding associated number of charging stations needed. Support long-term cost savings by including future needs in current upgrade plans.
- Consider how many vehicles a single charger can support. Low average daily miles driven by many of the utility's light-duty vehicles recommended for replacement suggests that EV alternatives may not require daily charging, thus allowing one level 2 charging station to support two or three EVs.
- Assign vehicle parking locations to enable charging. Installing charging stations inside garage areas or near building exteriors is likely to require the Water Utility to add the least conduit to connect the stations to the electrical panel. We recommend that the utility reserve locations in garages or near buildings where it will park EVs and establish a policy that prohibits non-EVs from parking in these spots.

FUNDING OPTIONS

The cost for implementation of solar installations and fleet purchases is significant. However, there are several sources of funding that the Water Utility can consider.

Leverage fuel and maintenance cost savings generated by use of EVs and building energy efficiency to fund capital expenses.

As identified in the report, the energy efficiency, solar installations, and fleet upgrades will save the Water Utility money in annual operating cost. The Water Utility could quantify avoided energy and maintenance costs from EVs, solar and efficient buildings and apply those avoided costs to purchase electric vehicles, solar panels, and high-efficiency equipment during the subsequent budgeting cycle.

Utilize Focus on Energy existing incentives.

WPS participates in Focus on Energy statewide incentives for renewable energy installations and energy efficiency upgrades and installations. It's recommended that the Water Utility provide a copy of this report to its Energy Advisor and ask for assistance in identifying the best way to access rebates. The amount available is determined by each energy efficiency measure and often specific characteristics of the equipment, such as the size of the solar system or efficiency of the new equipment.

Apply for federal tax credits.

The Inflation Reduction Act includes a provision, direct pay, that makes non-taxable entities eligible for the tax credits. Table 10 highlights the tax credits most relevant to recommendations in the plan, including renewable energy installations and alternative vehicle purchases.

The alternative vehicle tax credits have a limit per vehicle but there are no limits on total amount of projects rebated in a year or total amount of money the Water Utility can receive in a year. All credits are available starting for any projects implementing in 2023 and extend to 2032. The vehicle charging tax credits must be in low-income or non-urban census tracts. The City of Green Bay has several census tracts that qualify as low-income tracts, and they should be eligible for the credit.

Table 10. Eligible tax credits for direct pay/elective pay

	Renewable Energy	Alternative Vehicles	Vehicle Charging
Energy Plan Items	Solar installations	Electric vehicle or PHEV purchases	Refueling and charging property
Amount	30% of upfront cost	30% of vehicle cost (or 15% for PHEVs) or incremental cost compared to ICE	6% of upfront cost 30% if prevailing wage and registered apprentice requirements are met
Limit	-	$40,000 for vehicles over 14,000 lbs $7,500 for vehicles under 14,000 lbs	$100,000
Bonus	10% if meets domestic content requirements for steel and iron	-	-
Restrictions		From a qualified manufacturer[6]	Must be in a low-income or non-urban census tract

[6] A list of qualified commercial vehicles is here: https://www.irs.gov/credits-deductions/manufacturers-for-qualified-commercial-clean-vehicle-credit

APPENDIX A: FLEET METHODOLOGY

The methodology used to analyze current vehicle performance and prepare recommendations for fleet vehicle replacements is described below:

1. Calculate key performance indicators (KPIs) for existing Water Utiliy fleet vehicles.
    - Collected data showing the number of gallons and cost of fuel purchased for each vehicle, as well as the fuel type (gasoline, diesel, or other) during a 12-month period
    - Collected data showing the number of miles driven by each vehicle during the same 12-month period.
    - Applied data for fuel use, fuel type, and miles driven to calculate the pounds of CO_2 emitted by each vehicle.
    - All City-owned vehicles were assigned to one of fourteen categories: Small Car, Mid-size Car, Large Car, Compact Pickup, Full-size Pickup, Heavy-duty Pickup, Small SUV, Mid-size SUV, Full-size SUV, Hybrid SUV, Passenger Van, Work Van, Large Truck, and "Other." [Other includes on-road and off-road equipment, such as lawnmowers, street sweepers, and tractors.]
    - Calculated the annual fuel use, fuel cost, miles driven, and CO_2 emissions for all Water Utility vehicles, then segmented each metric for each vehicle category.
2. Surveyed the market to identify all commercially-available electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs) for the categories of vehicles found in the Water Utility's fleet. Also evaluated options for other alternative fuel vehicles, such as LP.
    - Limited findings to eliminate vehicles that are not yet in production or had limited market share, making them difficult for the Water Utility to obtain.
    - Based on market trajectories, alignment with climate goals, and budget constraints limiting opportunities for future shifts in vehicle types, focused analysis and recommendations on EVs and PHEVs.
    - Within each vehicle category, identified a cost-effective EV option that met minimum driving range requirements and had a strong fuel economy (kWh/100 miles) rating to use for opportunity analysis.
    - Used the commercial clean vehicle tax credit qualified manufacturer list to reduce the assumed cost of each EV by the value of any Federal tax credit[7] for which it may be eligible.
3. Surveyed the market to identify a leading gasoline or diesel-powered vehicle in each existing vehicle category in the Water Utility fleet that the Water Utility would be likely to consider for purchase during its normal vehicle retirement and replacement process.
    - Identified cost and fuel economy metrics for each selected vehicle.
4. Used previous gasoline, diesel, and electricity costs to calculate the cost of fuel used to drive one mile by the selected EV in comparison to the cost of gasoline or diesel needed to fuel a new conventional vehicle in the same category.
5. Applied research by Consumer Reports[8] to estimate the average per mile maintenance costs for EVs and gasoline or diesel-powered vehicles.

[7] Municipalities have access to certain Federal tax credits through a direct pay provision in the Inflation Reduction Act.
[8] Harto, C. *Electric Vehicle Ownership Costs: Chapter 2 – Maintenance.* Consumer Reports. September, 2020. (https://advocacy.consumerreports.org/wp-content/uploads/2020/09/Maintenance-Cost-White-Paper-9.24.20-1.pdf)

6. Calculated the potential cost savings per mile [fuel cost + maintenance cost] that the Water Utility could obtain by purchasing an EV in place of a gasoline or diesel vehicle. If the net purchase cost of the EV exceeded the cost of the gasoline or diesel vehicle, calculated the number of miles after which the per mile cost savings from driving the EV would surpass the incrementally higher purchase cost of the EV.
7. Met with relevant Water Utility staff to discuss recommendations and understand driving patterns and potential for charging infrastructure additions.

Green Bay Water Commission

MEMORANDUM

DATE: **December 11, 2023**
TO: **Green Bay Water Commission**
FROM: **Brian Powell, P.E., General Manager, Green Bay**
RE: **Water 2024 Water Commission Meeting Dates**

Green Bay Water requests the Green Bay Water Commission's approval for scheduling the 2024 Water Commission meetings. The proposed dates are as follows, with meetings being held in a hybrid format, offering both in-person attendance and Zoom participation options:

- Monday, January 8, 2024, at 8:30 a.m.
- Monday, February 12, 2024, at 8:30 a.m.
- Monday, March 11, 2024, at 8:30 a.m.
- Monday, April 8, 2024, at 8:30 a.m.
- Monday, May 13, 2024, at 8:30 a.m.
- Monday, June 10, 2024, at 8:30 a.m.
- Monday, July 8, 2024, at 8:30 a.m.
- Monday, August 12, 2024, at 8:30 a.m.
- Monday, September 9, 2024, at 8:30 a.m.
- Monday, October 14, 2024, at 8:30 a.m.
- Monday, November 11, 2024, at 8:30 a.m.
- Monday, December 9, 2024, at 8:30 a.m.

Your consideration and approval of this schedule are greatly appreciated.

Green Bay Water Commission
MEMORANDUM

DATE: December 11th, 2023
TO: Green Bay Water Commission
FROM: Brian Powell, General Manager and Jason Maes, Distribution Manager
RE: Approval Request for Government Pricing Contracts for Vehicle and Equipment Procurement

Green Bay Water requests the Water Commission's approval to adopt a new procurement strategy for vehicles and equipment. Our standard practice has been to solicit three bids to ensure competitive pricing, but supply chain disruptions have often limited us to a single bid, causing significant delays. Traditionally, a six-month period from bid to acquisition was the norm, but this has now extended to up to eighteen months. The impact of these delays is seen in our recent attempt to purchase a backhoe, which has compromised our ability to maintain crucial front-line vehicles necessary for operational integrity and safety.

After discussions with the City of Madison's Fleet Manager, it became evident that similar challenges have been successfully addressed through state contract pricing and participation in the cooperative purchasing program Sourcewell. These methods have facilitated more efficient procurement, often within the same calendar year.

Green Bay Water requests that we also utilize state contract pricing to leverage pre-negotiated rates and join cooperative purchasing programs. This approach is expected to accelerate our procurement process, potentially save costs through government rates, and increase the likelihood of acquiring necessary equipment within the same calendar year.

Your approval of this proposal is critical for maintaining our operational efficiency and ensuring the timely update and safety of our fleet.

Green Bay Water Commission
MEMORANDUM

DATE: December 11, 2023
TO: Green Bay Water Commission
FROM: Kristin Romanowicz, P.E., Engineering Services Supervisor KAR 12/6/23
RE: Project Acceptance and Final Payment
Green Bay Water Utility Water Main Rehabilitation

We request Green Bay Water Commission's acceptance of the work completed under the contract titled "Green Bay Water Utility Water Main Rehabilitation." The work under this contract consisted of cured-in-place-pipe (CIPP) lining of the water main on Hazelwood Lane.

In accordance with the terms of the contract, we also request the Commission's approval of the associated final payment of $12,211.50 to Fer-Pal Construction USA, LLC.

Green Bay Water Commission
GENERAL MANAGER UPDATE

DATE: **December 11, 2023**
TO: **Green Bay Water Commission**
FROM: **Brian Powell, P.E., General Manager, Green Bay Water**
RE: **General Manager Update**

As the new General Manager, I look forward to achieving goals that reflect our commitment to excellence in service and environmental stewardship. Here's an overview of our key initiatives and objectives:

1. **Lead Service Replacement Program:** We are continuing our efforts to enhance water quality and safety through the Private Side Lead Service Replacement Program.

2. **Workforce Report:**
- **Current Openings:** We are looking to expand our skilled team with new roles, including a Full-Time Distribution Maintenance Technician and a Full-Time Accountant.
- Staffing Updates: We welcome Doug Martin, our new Operations Manager, starting December 18th.

3. **Approval of Lynn Gerlach to the Water Commission**—City Council approved on 12/5/23, her first meeting as a voting member will take place on 1/8/24

4. **2024 General Manager Goals:**
- *Goal 1: Continue to improve efficiency of transmission system*
    - Install insertion mag meters at the Filter Plant on finished water 36" transmission mains (Q4)
    - Configure meter reading software to query individual meter readings by pressure zone to compare to the meters at our stations capturing the volume of water entering each specific pressure zone (Q4)
- *Goal 2: Prioritize future replacement of water mains and align with city on replacement plan*
    - Complete Master Plan update, including priorities for water main replacements, and share relevant results with DPW (Q1)
    - Investigate new technologies that can help us better identify which mains need replacing and allow us to replace them more cost-effectively (Q4)

- *Goal 3: Develop a detailed plan to move toward carbon neutrality per city policy*
    - Implement “no regrets” Slipstream recommendations (Q2)
    - Engage Donohue & Associates to make specific, detailed recommendations about energy efficiency, electrification, and a shift to renewables (Q3)
- *Goal 4: Maintain employee satisfaction and competitive compensation*
    - Complete Salary Study and recommend adjustments to compensation as appropriate (Q2)
    - Determine whether to conduct Workforce Analysis (Q2)
    - Update Strategic Plan and communicate it to workforce (Q3)
- *Goal 5: Enhance existing water quality monitoring*
    - Join newly launched Partnership for Safe Water by adopting common water-quality reporting standards and goals (Q1)
    -

Your support and collaboration in these efforts are important as we continue to serve our community.

GREEN BAY WATER COMMISSION RESOLUTION

Acknowledging the Retirement of

Kathryn Hasselblad-Pascale

WHEREAS, Commissioner Kathryn Hasselblad-Pascale has, since 2004, devoted nearly two decades of exceptional service to the Green Bay Water Commission, distinguishing herself through her commitment and leadership; and

WHEREAS, Kathryn Hasselblad-Pascale has held several esteemed positions, including that of the NEW Water Commission President and has played a significant role in numerous organizations, including the Chamber and the State Bar of Wisconsin; and

WHEREAS, Kathryn Hasselblad-Pascale, in her role as Managing Partner for Hasselblad Machine Company, as well as Director of various notable institutions, has exercised remarkable leadership and has been a vanguard of change and progress in the community; and

WHEREAS, Kathryn Hasselblad-Pascale's affiliations with a host of prominent organizations in Northeast Wisconsin have enabled her to make wide-reaching contributions that have bolstered the community's growth and welfare; and

WHEREAS, her visionary leadership and steadfast dedication have left an indelible legacy on the Green Bay Water Commission and its beneficiaries; and

WHEREAS, the forthcoming vacancy resulting from Commissioner Hasselblad-Pascale's retirement presents an occasion for reflection on her indomitable spirit and determination, as well as a need for succession planning;

NOW, THEREFORE, BE IT RESOLVED that the Green Bay Water Commission hereby extends its deepest gratitude to Commissioner Kathryn Hasselblad-Pascale for her service, which has profoundly enhanced the standard of utility service and community life in Green Bay; and

BE IT FURTHER RESOLVED that the Commission recognizes the significant responsibilities undertaken by Commissioner Hasselblad-Pascale and pledges to continue her legacy of excellence; and

BE IT FURTHER RESOLVED that the Commission expresses its best wishes for Kathryn Hasselblad-Pascale in all future endeavors and avows that her contributions will be esteemed by the Commission and community for generations to come; and

BE IT FURTHER RESOLVED that a copy of this resolution be spread upon the minutes of the Green Bay Water Commission and that a suitable copy thereof be presented to Commissioner Kathryn Hasselblad-Pascale in recognition of her extraordinary contributions to the Commission and the community at large.

PASSED AND APPROVED this 11th day of December, 2023.

John C. Heugel Commission President	**Jamie Wall** Commission Vice President	**Tom Karman** Commission Secretary