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Wauwatosa Sustainability Committee
Annual Report to the City for Calendar Year 2022

April 5, 2023

2022 Committee Members

Rob Zimmerman(Chair)	Seth Flanders	Steve Ostrenga
Katherine Riebe (Vice Chair)	Zoe Hastert	Christine Wolf
Mary Young (Secretary)	Rob Hoverman	Chuck Pomerenke (City Liaison, non-voting)
Mike Arney	Lynn Morgan	Ald. Melissa Dolan (Council Liaison, voting)

2022 Executive Summary

The mission of the Wauwatosa Sustainability Committee (WSC) is to champion environmentally-sound practices fostering the City's long-term livability and economic vitality. The Committee advises the Common Council and City staff on sustainability matters and collaborates with residents, businesses, and other partners to advance the City's environmental goals.

Energy and associated greenhouse gas (GHG) emissions increased slightly in Wauwatosa's city-owned facilities in 2022 but maintained most of the improvement from previous years. Highlights:

- Reduced purchased electricity use by 0.8% (43,584 kWh) vs. 2021
- Increased overall GHG emissions by 1.0% (63 tons CO_2e) vs. 2021

Results from 2022 demonstrate the impact of ongoing energy efficiency projects such as improvements to street lighting, the successful operation of the 300kW PV solar installation at the DPW building, and annualization of the impacts from the 300 kW PV system at City Hall that started up in Spring 2021. This saving occurred despite more heating degree days in 2022.

The Wauwatosa Sustainability Committee thanks the City's Department of Public Works for its leadership in adopting various energy-efficiency technologies that ultimately benefit local taxpayers and the environment. Year-by-year energy and GHG data illustrate the impact of the investment in efficiency and are especially pronounced in years with spikes in energy prices, as occurred in 2022.

Energy and GHG Results

Wauwatosa City Operations:

The City's 2022 energy usage and GHG emissions were 2.4% higher and 1.0% higher, respectively, in 2022 compared to 2021. The City's energy expense increased by 28.4% due to high energy prices across all fuel types. Reducing overall energy use and increasing onsite electricity generation helps ease the financial impacts of volatile energy prices.

	HDD	CDD	Purchased Electricity (kWh)	Natural Gas (Therms)	Gasoline (Gallons)	Diesel (Gallons)	MMBTU	GHG (tons CO2e)	Energy Cost
2021	5,731	1,075	5,310,268	166,168	87,298	105,784	59,793	6,486	$1,210,164
2022	6,364	947	5,266.684	176,601	91,084	106,273	61,211	6,549	$1,554,434
Change	633	(128)	**(43,584)**	10,433	3,786	489	1,418	63	$344,270
% Change	11.0%	(11.9%)	**(0.8%)**	6.3%	4.3%	0.5%	2.4%	1.0%	**28.4%**

Looking at the price increases in more detail, most of the increased energy cost to the City was due to the rise in liquid fuel prices:

	Electricity Price ($/kWh)	Electricity Cost ($)	Natural Gas Price ($/Therm)	Natural Gas Cost ($)	Gasoline Price ($/Gallon)	Gasoline Cost ($)	Diesel Price ($/Gallon)	Diesel Cost ($)	Energy Cost
2021	$0.12	$643,497	$0.70	$116,461	$2.32	$202,957	$2.34	$247,249	$1,210,164
2022	$0.13	$679,744	$0.87	$153,345	$3.38	$308,168	$3.89	$413,176	$1,554,434
Change	$0.01	$36,248	$0.17	$36,884	$1.06	$105,211	$1.55	$165,927	$344,270
% Change	7%	6%	24%	32%	**46%**	52%	**66%**	67%	28.4%

The reduction of greenhouse gas emissions (GHG) leveled off in 2022 with a 1.0% increase from 2021 to 2022, similar to the estimated national GHG emissions increase in 2022. The increase appears to correlate to the natural gas, gasoline, and diesel fuel consumptions which were up 6.3%, 4.3% and 0.5% respectively, along with relatively flat electricity use (down 0.8%).

Comparing energy use in different years can be challenging due to the circumstances in each year. Energy use will fluctuate due to heating degree days/cooling degree days, snowstorms causing increased fuel use for plowing, and building use or restrictions. Overall spending will change due to price changes in diesel fuel or natural gas in conjunction with fuel use. However, for some of the variables, normalizing the data can help highlight different areas. A specific example of this is natural gas usage for heating buildings. Normalizing the natural gas usage in Therms by Heating Degree Days (HDD) helps to understand the effect of building or equipment improvements. In 2022, the City used 27.8 Therms per Heating Degree day vs. 28.4 Therms / HDD in 2021. Both values are much less than the 2010 baseline of 41.8 Therms / HDD. Overall, Wauwatosa buildings have become much more

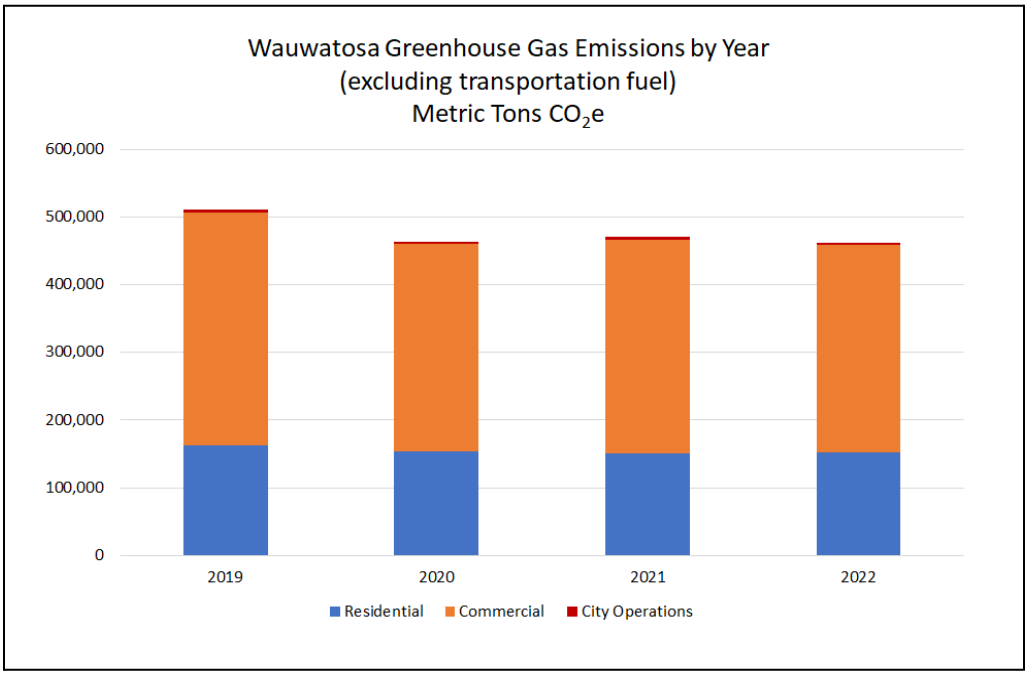
efficient in their natural gas use. The supporting data section of this report presents a chart of this data.

New solar arrays brought major reductions in net City electricity use in 2020 (DPW) and 2021 (City Hall). In 2022 we held onto those gains. The City remains poised to reach our 50%-below-2010 target for municipal operations emissions in 2030. Planned solar deployments at the Policy Department, Muellner Building, and Potter Road pumping station will continue to drive down electricity use. Geothermal in Hart Park will reduce natural gas use there. Liquid fuel use has been relatively flat since 2010 and will likely remain so for the next few years. But with many electric vehicles of all types now coming to market, attractive low-emission options will soon emerge for the City fleet.

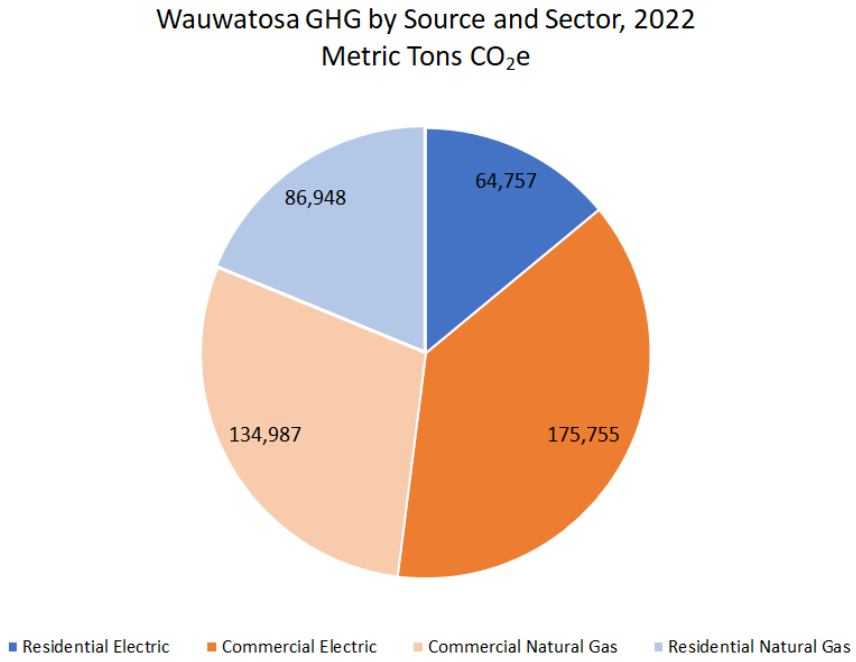
City-Wide Energy Use and Greenhouse Gas Emissions:

WSC engaged with WE Energies to provide aggregated data on electricity and natural gas use for Wauwatosa's residential and commercial energy customers. Data is available for 2019 through 2022, and will be updated yearly. The data provides a baseline for our energy and GHG reduction targets that are under development. Of note is the 9.6% decrease in overall GHG emissions in 2022 compared to the pre-pandemic year of 2019. Overall GHG emissions, not including transportation, declined by 1.6% in 2022 vs. 2021. Most of this decrease is due to WE Energies sourcing lower-carbon electricity.

City operations comprise less than 2% of the city-wide emissions, as represented by the thin red line at the top of each bar in the chart below. While the City Operations staff remains committed to reducing energy use and associated GHG emissions, it is apparent that significant progress is possible only if energy efficiency and renewable energy efforts are directed at both the Commercial and Residential sectors of Wauwatosa. Also, since this analysis is based solely on data from WE Energies, it does not include GHG emissions from transportation fuels. Data from other cities, including Milwaukee's research in 2018, suggest that transportation fuels would add approximately 25% to these values.



WE Energies has made public commitments to decarbonize its electricity generation by 2050. The CO_2 emissions to produce one kWh of electricity have decreased over the past decade due to WE Energies' conversion of power stations from coal to natural gas. However, to fully decarbonize, WE Energies needs to deploy renewable sources such as wind and solar much faster. As they do so, the GHG impact from Wauwatosa's electricity use will decrease. In 2022, approximately 52% of Wauwatosa's GHG emissions were due to electricity use, and the remaining 48% was due to burning natural gas. As stated previously, this data does not include transportation fuels.



Recycling and Composting Results

The City's solid waste diversion rate decreased from 27% to 26%. During 2022, 15,484 tons of municipal solid waste were collected in the City. Of that, 3,998 tons were diverted for recycling. The biggest challenge to curbside recycling continues to be the contamination of the materials that residents deposit in recycling bins. For example, many residents are still placing plastic bags in their bins. The plastic bags clog the sorting machinery and result in lower recyclable payments to the City. It is in the City's best interest, both financially and environmentally, to purify the recycling stream.

The City collected and composted 8,162 tons of yard waste in 2022. In addition, Wauwatosa businesses and households participated, at their own expense, in private curbside food waste composting services. The privately funded composting is a key indicator to making these services more cost effective or free at the City facilities, just as yard wastes are accepted. Diverting this material from landfills reduces the total volume of solid waste while providing organic materials such as landscaping mulch and wood chips by the City and available for pickup by Wauwatosa residents. Organic matter in sanitary landfills decomposes anaerobically to produce methane, a potent greenhouse gas. Studies in other communities report that 2-10% of their overall greenhouse gas emissions are from landfills.

Water Use

The City's water use increased by 10.0% in 2022 vs. 2021. Residential water use decreased by 6.6%, with CII (Commercial, Industrial, Institutional) uses increasing by 49.8% due to several large users now being transferred to Wauwatosa from Milwaukee. Overall, the City used 1.426 billion gallons of water in 2022, a 10.0% increase from 2021. Of this, 812 million gallons was for residential use. This equates to 46.6 gallons per capita per day (gpcd), which is typical of older cities in the Midwest and slightly lower than the national average of 52.1 gpcd.

Designations and Partnerships

SolSmart

Wauwatosa became a SolSmart Gold designee in 2021. The Solar Energy page on the City's website, created as part of the SolSmart process, is still a valuable resource for residents interested in solar.

Green Tier Legacy Communities

The City continues to participate in Green Tier Legacy Communities (GTLC), primarily through attendance at quarterly meetings. The GTLC has assisted the WSC in not only identifying best practices and metrics of similar municipalities that are resource constrained, but also forming a network of relationships with peer municipalities, non-profits, and the DNR in order to move faster toward achieving WSC goals. GTLC members such as La Crosse, Sheboygan, and Wausau are relatively similar in size to Wauwatosa. Sharing with and hearing from these communities as well as larger (Racine) and much smaller ones (Egg Harbor) has been affirming and motivating. The list of GTLC participants can be found here:
https://dnr.wisconsin.gov/topic/GreenTier/Participants/CharterPages/LegacyCommunitiesReports.html

Wisconsin Local Government Climate Coalition

In late 2021, the Council approved Wauwatosa joining the Wisconsin Local Government Climate Coalition (WLGCC). The group's mission is to provide a platform for members to collaborate on overcoming barriers to decarbonization, accelerating local climate change solutions, and ensuring the benefits of the clean energy economy are distributed to everyone throughout the state. Member cities represent 1.7 million Wisconsin residents. City sustainability leaders recognize that progress is determined through a combination of strategies both within their cities and across the state. Some of these statewide strategies include policies regarding distributed electricity generation, building codes, and building performance benchmarking and reporting. Members of WSC have been participating in WLGCC meetings since October 2021.

Milwaukee City-County Task Force on Climate and Economic Equity

In 2019, resolutions from the City of Milwaukee Common Council and County Board of Supervisors created the City-County Task Force on Climate and Economic Equity. This Task Force was charged with "making recommendations on how to address the ongoing climate crisis, ensure Milwaukee meets the obligations set by scientists for necessary greenhouse gas reduction, and mitigate racial and economic

inequity through 'green' jobs." A preliminary report was issued in March 2020 that recommended further study of ten "big ideas" that had the potential to significantly impact the County's greenhouse gas emissions while furthering economic opportunity for all. Multi-stakeholder workgroups were convened for each area in late 2020 and into 2021. WSC members were represented on three of the work groups: Preserve and Restore Nature in the City, Residential Energy Efficiency and Solar Retrofits, and Food Waste Reduction. A summary of recommendations from each of the ten work groups were presented to the Milwaukee Common Council in May 2022, and a draft plan was released for public comment in November 2022. Many of the recommended solutions and commensurate funding will be applicable for Wauwatosa.

2022 Wauwatosa Sustainability Committee Goals and Status

Goal	Status	Comments
1. Create and maintain an energy and greenhouse gas inventory for the City to use as a baseline for near-term energy and GHG reduction goals.		● Energy and GHG emissions for City operations as well as cumulative data for Wauwatosa, are being collected and reported annually. ● Also including waste/recycling and water use
2. Support the Wauwatosa School District's efforts to reduce its carbon footprint in operations and to engage students through school-wide "green teams" and other learning opportunities.		● WSC members met with school leaders and with staff and student green teams. Meetings with several schools represented to coordinate efforts. Superintendent Means supports more sustainability engagement. ● Potential for onsite solar with changes in financial incentives included in the Inflation Reduction Act.
3. Engage with City departments, elected officials, citizen committees, civic groups, and the general public to share information on the City's sustainability efforts and progress, and build support for a more sustainable Wauwatosa.		● WSC members shared information with the public from a table at the Wauwatosa Farmers Market in June, and the Tosa Green Summit in September. ● WSC met with the City's communication team; provided content for newsletter/social media posts. ● WSC has periodic check-ins with economic development staff. ● Shared presentations with Wauwatosa's Equity and Inclusion Commission ● Supported proposals for "No Mow May"; aligned with other Milwaukee suburbs on NMM messaging.
4. Identify and recommend specific policies, actions, or long-range goals which the City can enact or promote consistent with the City's Energy Resolution of October 2020, and ensure such items are incorporated into the City's strategic planning process.		● Provided background information to Operations staff regarding potential sustainability manager position. ● Supported staff's investigation of the viability of new solar PV at the former City landfill site.

 completed or made significant progress

 started; in progress

 not started or minimal progress

Additional Activities

- **No Mow May**

While it was not a directly stated goal, the Committee identified the practice known commonly as “No Mow May'' as a step towards promoting sustainable landscape practices in Wauwatosa. The intent of “No Mow May'' is to allow early blooming vegetation for pollinators to consume as a source of dwindling food supplies. Working with Alderpesons and City staff, the Committee presented options to alter the existing code to push back enforcement of grass heights until June, thereby updating an existing code. Through the cooperation of the citizen committee, Community Affairs Committee, and the Common Council, the “Adoption of No Mow May” occurred on December 20, 2022. Participation by City residents and businesses is voluntary.

- **Sustainability Manager/Coordinator Staff Position**

On November 15, 2022 the Common Council adopted a plan presented by Alder Dolan and supported in person by WSC members for the creation of the position of Sustainability Manager to be included within the Department of Public Works. Said position is consistent with the approved Strategic Plan, and the City agreed to adopt the Vision, Missions and Organizational Values contained within the strategic plan as presented to the Committee of the Whole on September 6, 2022

Wauwatosa Sustainability Committee 2023 Work Streams

1. Create and maintain an energy/greenhouse gas inventory and reporting framework for the City to use as a baseline for near-term energy and GHG reduction goals.

2. Identify and recommend specific policies, actions, or long-range goals which the City can enact or promote consistent with the City's Energy Resolution of October 2020.

3. Establish and grow partnerships with City departments and committees, elected officials, civic groups, the Wauwatosa School District, and other communities and organizations that support Wauwatosa's efforts to reduce its overall environmental impact and achieve its sustainability goals.

4. Engage with Wauwatosa residents and businesses to share ideas and practices that enhance sustainability in the community.

Supporting Data

City Government Energy and GHG Results, 2010-2021

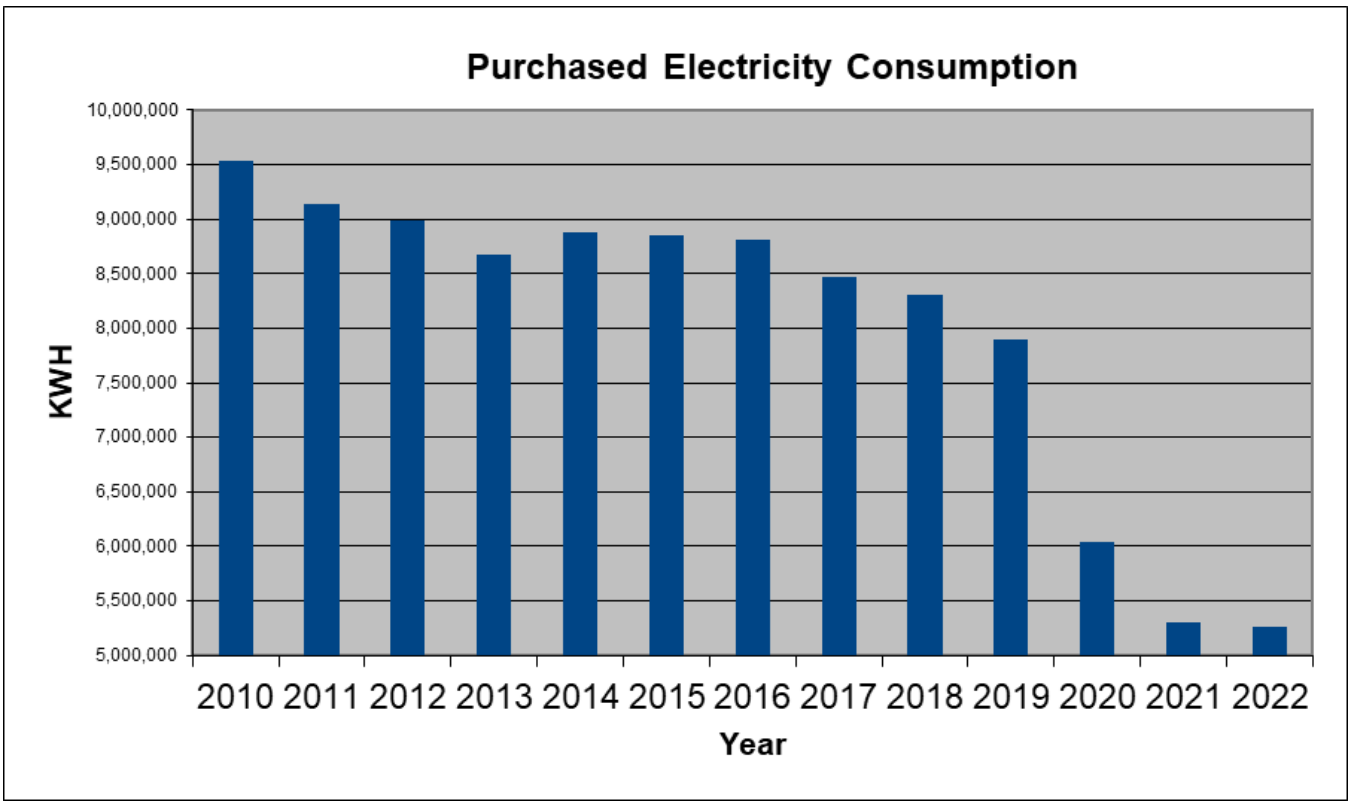
Year	HDD	CDD	Purchased Electricity (KWh)	Natural Gas (Therms)	Gasoline (gallons)	Diesel (gallons)	MMBTU	CO2e (Tons)	Dollars
2010	6,183	944	9,538,796	258,700	96,266	91,890	82,645	10,725	$1,514,995
2011	6,633	793	9,136,848	253,225	94,670	93,689	80,781	10,392	$1,650,433
2012	5,703	1,041	8,993,549	207,404	96,288	93,958	75,941	10,034	$1,651,593
2013	7,233	688	8,679,293	268,624	91,341	103,216	81,668	10,207	$1,724,667
2014	7,616	464	8,878,545	300,852	88,088	111,957	86,380	10,612	$1,750,699
2015	6,468	622	8,850,347	237,108	85,097	97,590	77,574	10,029	$1,452,050
2016	6,068	991	8,807,278	210,261	87,949	97,361	75,055	9,865	$1,374,577
2017	5,926	777	8,471,286	196,238	88,551	92,683	71,936	9,482	$1,364,956
2018	6,694	929	8,299,790	210,478	91,561	101,098	74,294	9,557	$1,460,888
2019	6,835	727	7,896,032	211,152	95,998	105,970	74,188	8,631	$1,427,603
2020	6,094	938	6,037,021	162,325	93,611	97,533	61,515	6,952	$1,075,791
2021	5,731	1,075	5,310,268	166,168	87,298	105,784	59,793	6,486	$1,210,164
2022	6,364	947	5,266,684	176,601	91,084	106,273	61,211	6,549	$1,554,434

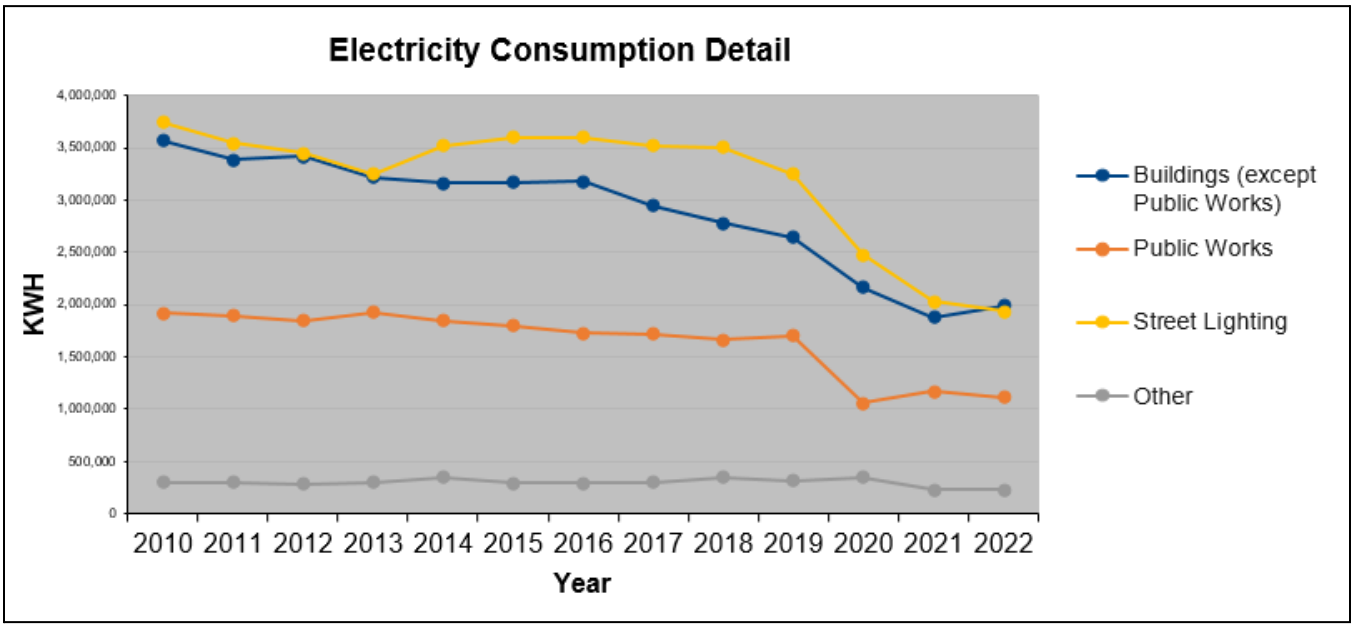
Abbreviations:

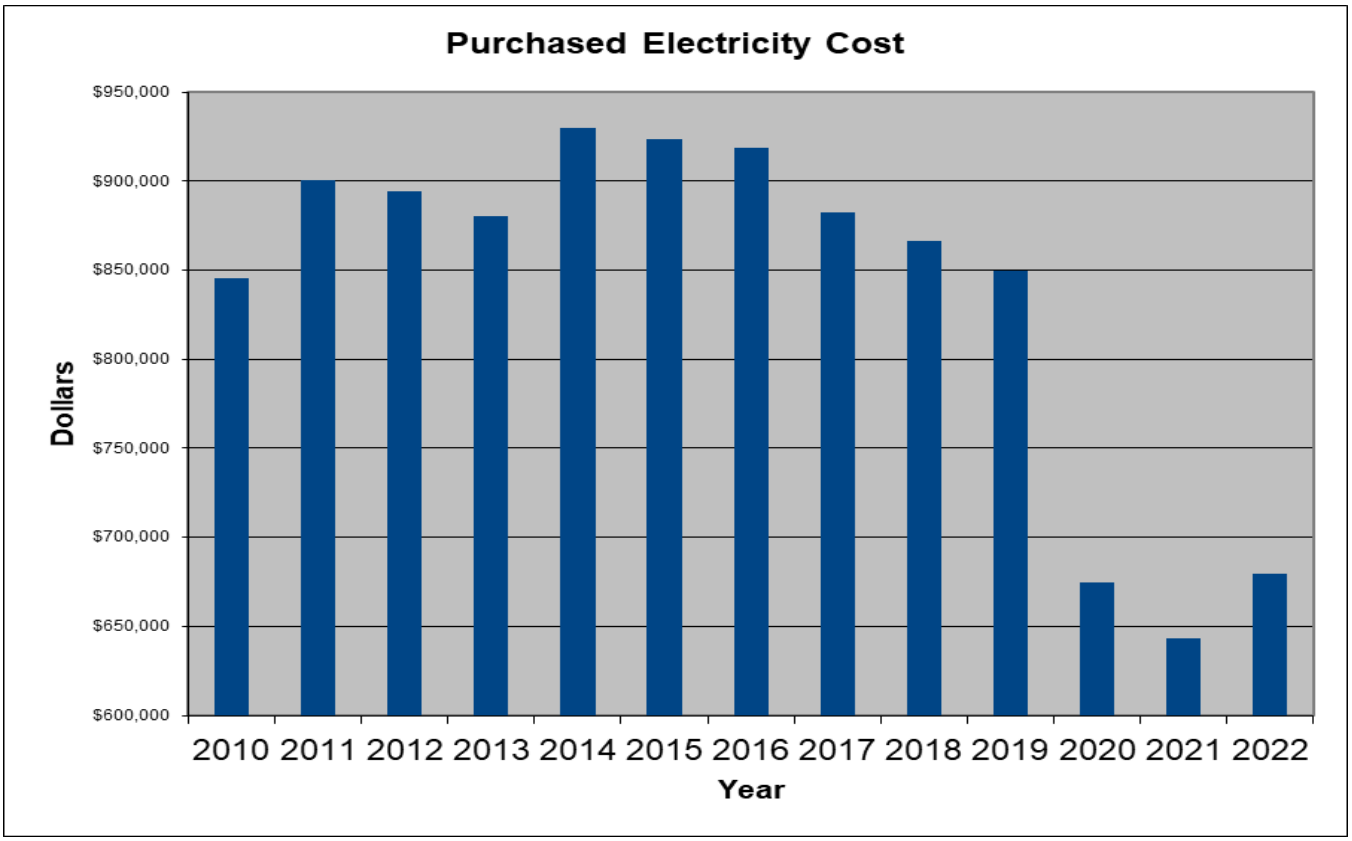
HDD: heating degree days
CDD: cooling degree days
KWh: kilowatt-hours of electricity
Therm: amount of natural gas required to produce 100,000 BTU (0.1 MMBTU) of heat
MMBTU: million BTU. Energy content of various fuels purchased are expressed in MMBTU and summed to show the total energy used for City operations.
CO_2e: estimated emission of greenhouse gases, in tons of CO_2 equivalent. Greenhouse gases other than CO2 are assigned factors based on their relative global warming potential and are included in this value.
Source: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.

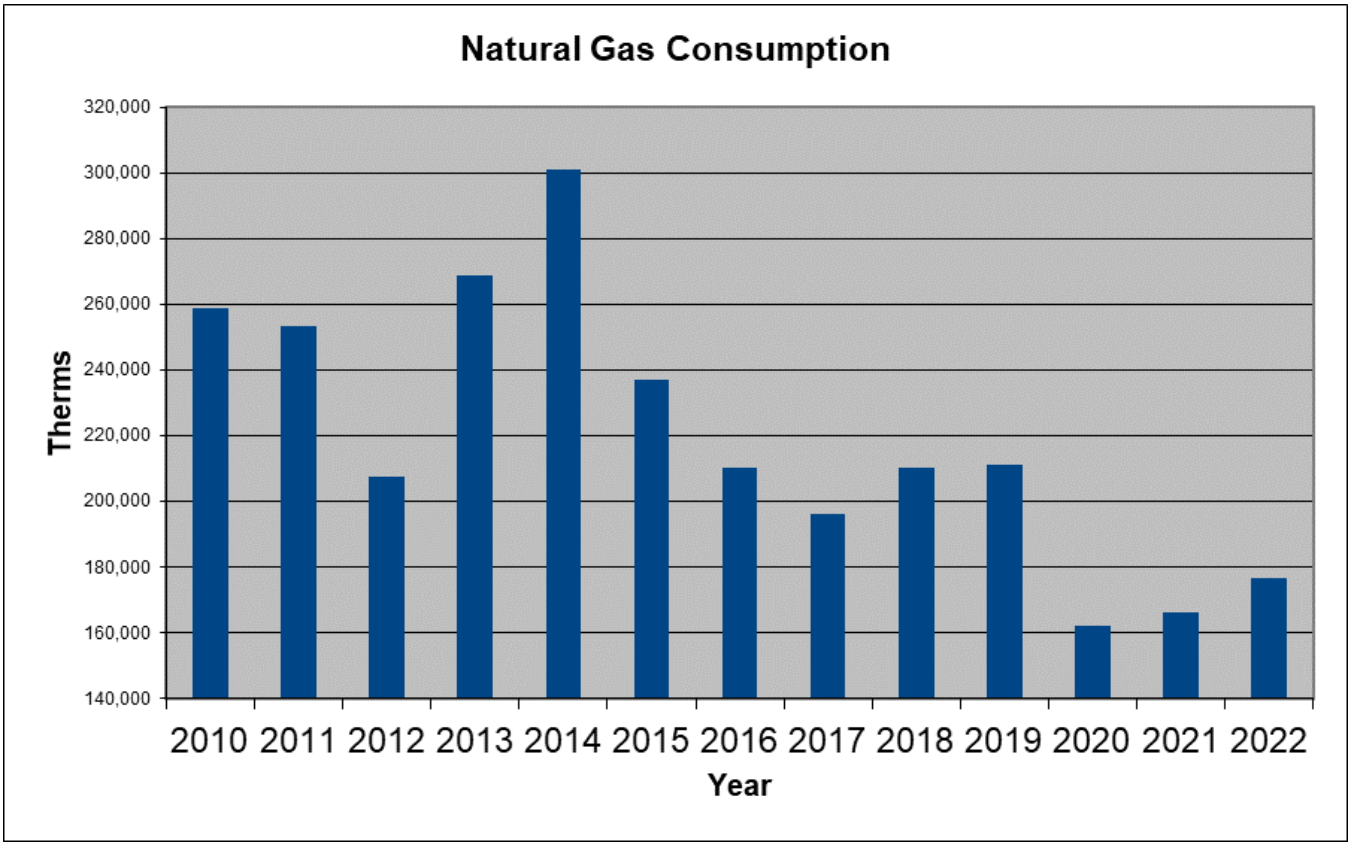
The spreadsheet is available in Microsoft Excel format by request of the Committee.

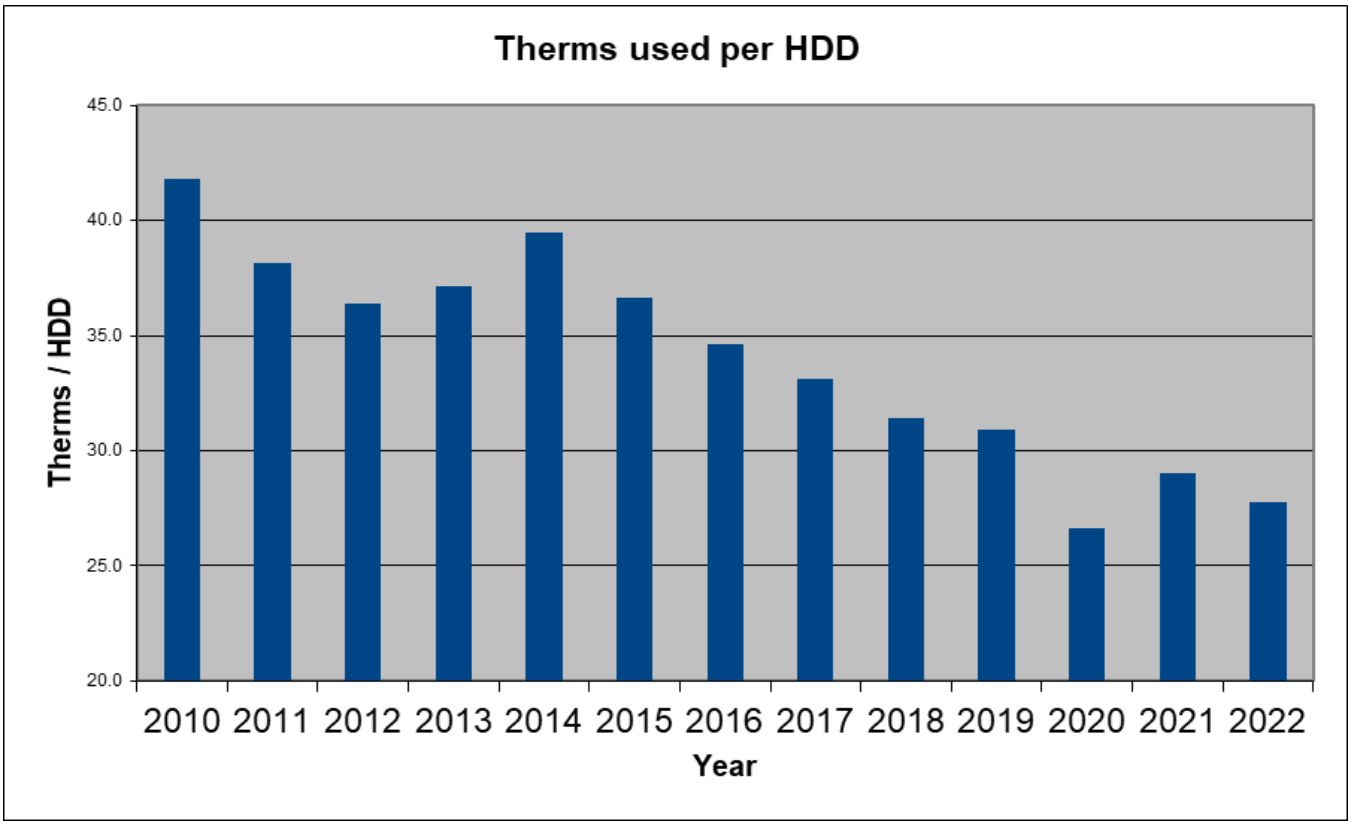
Selections from the data is presented graphically on the following pages:

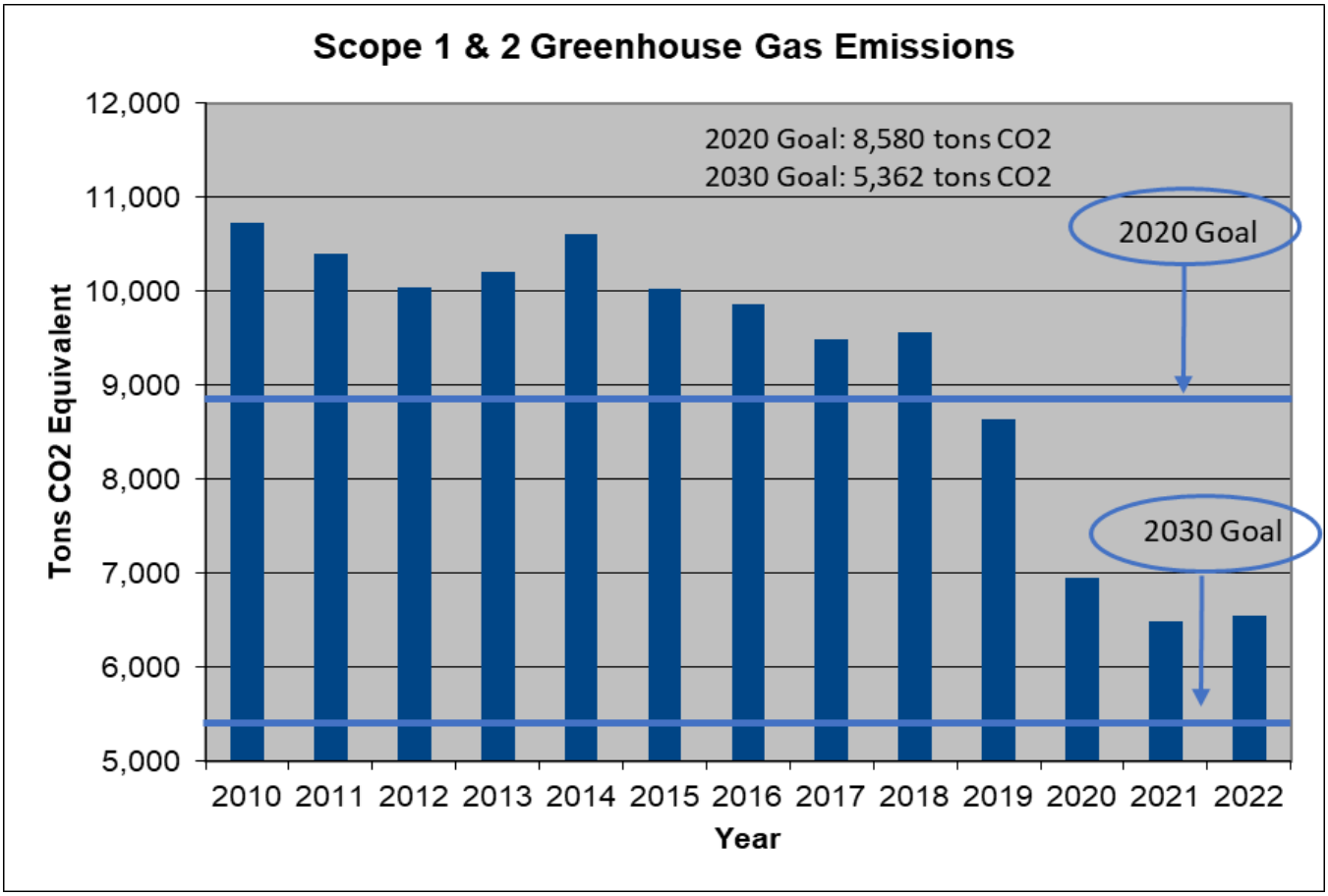

Purchased Electricity Consumption
10,000,000
9,500,000
9,000,000
8,500,000
8,000,000
7,500,000
7,000,000
6,500,000
6,000,000
5,500,000
5,000,000
KWH
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year


Electricity Consumption Detail
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
KWH
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year
Buildings (except Public Works)
Public Works
Street Lighting
Other


Purchased Electricity Cost
$950,000
$900,000
$850,000
$800,000
$750,000
$700,000
$650,000
$600,000
Dollars
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year


Natural Gas Consumption
320,000
300,000
280,000
260,000
240,000
220,000
200,000
180,000
160,000
140,000
Therms
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year


Therms used per HDD
Therms / HDD
45.0
40.0
35.0
30.0
25.0
20.0
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year


Scope 1 & 2 Greenhouse Gas Emissions
Tons CO2 Equivalent
12,000
11,000
10,000
9,000
8,000
7,000
6,000
5,000
2020 Goal: 8,580 tons CO2
2030 Goal: 5,362 tons CO2
2020 Goal
2030 Goal
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022
Year

WE Energies City-Wide Energy Data, 2019-2022

	2019		2020			2021			2022		
Residential		GHG (MT CO2e)		GHG (MT CO2e)	y/y change		GHG (MT CO2e)	y/y change		GHG (MT CO2e)	y/y change
Electric Customers:	23,959		23,936			24,317			22,161		
Electricity (kWh):	149,249,818	73,132	159,431,943	73,020	-0.20%	160,460,770	71,405	-2.20%	156,040,679	64,757	-9.30%
Gas Customers:	21,468		21,518			21,701			19,710		
Gas (therms):	16,891,191	89,523	15,129,368	80,186	-10.40%	15,021,828	79,616	-0.70%	16,405,364	86,948	9.20%
Total Residential:		162,655		153,206	-5.80%		151,021	-1.40%		151,705	0.50%
Commercial											
Electric Customers:	1,316		1,318			1,310			2,250		
Electricity (kWh):	435,758,457	213,522	406,627,927	186,236	-12.80%	434,921,137	193,540	3.90%	423,505,260	175,755	-9.20%
City Operations:	7,896,032		5,951,905		-24.60%	5,310,268		-10.80%	5,266,684		-0.80%
Gas Customers:	1,010		1,025			1,072			1,400		
Gas (therms)	25,500,658	135,153	23,486,797	124,480	-7.90%	23,666,237	125,431	0.80%	25,469,314	134,987	7.60%
City Operations:	211,152		162,325		-23.10%	166,168		2.40%	176,601		6.30%
Total Commercial:		348,675		310,716	-10.90%		318,971	2.70%		310,742	-2.60%
Private Street Lighting											
Electricity (kWh):	507,979	249	514,145	235	-5.40%	422,774	188	-20.10%	419,724	174	-7.40%
TOTAL GHG (MT CO2e):		**511,579**		**464,157**	**-9.30%**		**470,180**	**1.30%**		**462,622**	**-1.60%**

Does not include transportation
Does not include fuel oil for heating
City Operations use is included in Commercial data from WE Energies
"Customers" are discreet meters