



2022
BUILDING ENERGY
BENCHMARKING REPORT

Table of Contents

1. INTRODUCTION	3
Background & Reporting Requirements	3
<i>Relevant County Initiatives</i>	4
<i>Methodology</i>	5
2. BUILDING ENERGY USE.....	6
3. GREENHOUSE GAS EMISSIONS	10
Appendices	13
<i>Appendix A: Energy Performance Metrics</i>	13
<i>Appendix B: Weather Normalized Energy Usage Trends (Source EUI)</i>	14
<i>Appendix C: GHG Emissions Trends</i>	15

1. INTRODUCTION

Background & Reporting Requirements

Resolution No. 447 of 2016 established a policy requiring annual public reporting of building energy consumption and benchmarking information for County-owned buildings. Annual benchmarking reports are prepared by the Department of the Environment and published on the County's [benchmarking](#) webpage.

Ulster County's current building portfolio for energy benchmarking consists of **32 properties**, some of which are campuses with multiple buildings on site, with gross floor area totaling approximately **797,000 square feet**.

Building energy use benchmarking is critical to tracking energy savings over time as well as the achievement of greenhouse gas (GHG) emissions reduction goals:

- It allows the comparison of weather-normalized energy metrics across time periods to assess the impact of building efficiency improvements.
- It allows comparison to a national standard (EPA ENERGY STAR®) and average commercial building performance across the United States—helping to identify outlier properties within the Ulster County portfolio, communicate the opportunity for energy efficiency, and focus energy management attention.

One of the main goals of this annual benchmarking report is to consistently track and monitor the energy use and GHGs associated with the County's building inventory to better inform operations and planning activities; to improve efficiency and reduce costs; and to track progress.

The benchmarking policy requires reporting on Ulster County-owned or occupied buildings with a gross floor area equal to or greater than 1,000 square feet, to include the following building performance metrics (using EPA's EnergyStar Portfolio Manager software):

- Energy Use Intensity (EUI)
- Weather Normalized Source EUI
- Annual Greenhouse Gas emissions
- Energy performance score (where available)

Relevant County Initiatives

- **2018 Government Operations Climate Action Plan (CAP)**¹: The CAP provides an implementation roadmap for energy use reduction and renewable energy projects across County government operations, with County Executive Jen Metzger's [Executive Order No.1 of 2023](#) (EO1-23) additionally committing Ulster County government to reducing GHG emissions in alignment with the 2019 New York State Climate Leadership and Community Protection Act ("NYS Climate Act") and establishing GHG emissions reduction goals of 40% by 2030 and 85% by 2050, with an interim target of 25% by 2025.

The County's 2012 greenhouse gas emission inventory (GHGI) was used as a baseline year in the CAP to measure progress in meeting the established GHG emissions reduction goals. The 2012 GHGI showed that the buildings & facilities sector alone accounted for 43% of all County government operations GHGs, totaling 5,804 metric tons of CO₂e.²

- **Onsite Energy Manager Program**: This project is 75% funded via the NYSERDA On-site Energy Manager (OsEM) program and will improve the operations and performance of various mechanical and electrical equipment, and will ultimately result in energy savings for County government operations. The OsEM will provide oversight, coordination, savings and cost estimates, documentation of progress, and measurement and verification of savings over the project's 18-month duration (through Q3 of 2024). The project's overall goal is to achieve an annual savings of 6% of the total utility usage across County facilities.
- **LED Lighting Retrofits**: A large project is currently underway to convert over 1,000 lights and several hundred switches in the County's Department of Social Services. This conversion from fluorescents to LEDs will result in significant energy savings as well as an estimated total annual cost savings of \$31,500.
- **Building Weatherization**: The Ulster County Department of the Environment is headquartered at 17 Pearl Street in Kingston, New York, within a historically significant structure dating back to 1846 which has been repurposed to serve as a government office space. A project is underway to complete a comprehensive air-sealing initiative targeting the building envelope, upgrades in insulation, and enhancements to ventilation systems, which is projected to yield an annual reduction of over 1,300 kWh as well as associated cost savings. NYSERDA Clean Energy Communities Program point and action-based grants will partially fund the work.

¹ Available at: <https://ulstercountyny.gov/environment/climate-action-plan>

² Reference Ulster County Greenhouse Gas Emissions Report, VHB, 2012. Available here: <http://ulstercountyny.gov/environment/energy-sustainability>

The County Departments of the Environment and Public Works, among others, continue to implement relevant projects across County buildings and facilities, many of which are also priority Government Operations CAP actions.

Some current examples include:

- Ulster County Area Transit “Bus Garage of the Future”: This project will expand the DC fast charging infrastructure for the County’s growing fleet of electric buses and will also include rooftop solar and battery energy storage systems, and will reduce operating costs (in part via savings in grid-purchased electricity and demand charges) as well as make the facility more resilient through power outages.
- Solar Assessments and Installations: Solar assessments are ongoing at County facilities, with installations planned where feasible.
- Electric Vehicle (EV) Charging Infrastructure: The County’s Green Fleet Policy ³ was amended in 2023 and requires that all County fleet passenger and light-duty trucks as well as transit vehicles are zero-emission by 2035. The County continues to electrify its fleet and several projects are underway to install EV charging stations at County facilities and continue to expand both the fleet and public EV charging station networks.

Methodology

Ulster County benchmarks building energy using the EPA’s ENERGY STAR Portfolio Manager application, an online tool that tracks energy, water, and waste consumption and calculates a variety of energy performance metrics as well as greenhouse gas emissions. Portfolio Manager calculates weather normalized metrics, a way to remove the impacts of climate differences in year-to-year comparisons. Energy use and emissions data from 2012 has been used as a baseline value for benchmarking purposes, to show progress toward Ulster County’s GHG reduction goals.

Electric Vehicle (EV) Charging Stations: Several Ulster County properties have EV charging stations installed on site and configured to draw energy from the building electrical panel. Without any adjustments, this energy would be included in the building energy use metrics and would indicate excess usage as the energy is used to power vehicles and not the building systems. However, using data from the ChargePoint® EV charging station reporting system, this electricity usage can be deducted from the building usage to report an accurate building use total. The portion of this electricity used for fleet vehicles is reported in the Ulster County Green Fleet report annually.

Fixed Usage Area Lighting: Twelve Ulster County properties are billed monthly for utility-provided outdoor area lighting, which is reflected as “Flat Charge” usage on the utility invoice for the account and is billed by Central Hudson according to Service

³ Available at: <https://ulstercountyny.gov/environment/sustainability-energy/green-fleet-initiative>

Classification Number 5 rates. This usage is included in the metrics for each property with lighting installed. The cost includes fees for the rental of the lighting equipment from Central Hudson. Where applicable, a property use-type of parking and parking area estimate are input in the Portfolio Manager system for improved accuracy in calculating energy use metrics.

Factors and Conversions: The EPA Portfolio Manager application converts all fuel types to a common energy unit—thousands of British thermal units (kBtu)—to allow for aggregation to calculate whole-building energy use. To do so, the Portfolio Manager application applies the thermal conversion factors contained in Table 1 below. This conversion allows the comparison of relative magnitudes of energy use across fuel types as shown in Chart 1.

Table 1: Conversion Factors⁴

Fuel Type	Input Unit	Conversion Factor
Electricity (Grid Purchase)	kWh	3.412 kBtu/kWh
Natural Gas	CCF	102.6 kBtu/CCF
Propane	Gallons	92 kBtu/gal
Fuel Oil (No. 2)	Gallons	138 kBtu/gal
Diesel	Gallons	138 kBtu/gal
Wood	Tons (US)	17,480 kBtu/ton

2. BUILDING ENERGY USE

Ulster County uses the following energy sources shown in Table 2 for heating, cooling, and powering its buildings. Usage and cost data is obtained from the vendor through web applications or data requests.

Table 2: Energy Types and Data Sources - 2022

Energy Type	Supplier and Data Source
Electricity	Delivery: Central Hudson (web access) NYSEG (web access & customer service) Supply: Constellation NewEnergy, Inc. (web access via Central Hudson)
Natural Gas	Delivery: Central Hudson (web access) Supply: Agera Energy, LLC (customer service request) Family Energy, Inc. (web access via Central Hudson)
Fuel Oil	HOP Energy, LLC (customer service request)
Propane	Paraco Gas Corp (web access), JK&Sons Fuel
Diesel Fuel (for generators)	HOP Energy, LLC (customer service request), Bottini

Note regarding 2022 energy use data: This is completed to the most accurate and complete extent possible. Currently, energy-use metrics for benchmarking are not calculated for properties where Ulster County leases office space in facilities without sub-

⁴ Retrieved from:

<https://portfoliomanager.energystar.gov/pdf/reference/Thermal%20Conversions.pdf>

metering. In these cases, energy use data for the leased spaces cannot be separated from whole building energy use. Table 3 contains a listing of these spaces as of December 31st, 2022.

Table 3: Leased Space without Metered Energy Use Data – 2022

Property	Address	UC Leased Space (sq. ft.)	Total Building Space (sq. ft.)
Board of Elections	79 Hurley, Kingston, NY	N/A	23,918
Former Board of Elections	284 Wall St, Kingston, NY	3566	27137
Public Defender	280 Wall Street, Kingston, NY	4,848	27,137
Department of Health - W.I.C.	230 Aaron Court, Kingston, NY	2,917	9,000
Probation Department	124 Main Street, New Paltz, NY	1,308	4,920
Office of Employment and Training	521 Boice's Lane, Kingston, NY	10,287	98,464
Sheriff's Substation Walkkill	1500 Rt. 208, Walkkill, NY	711	3,840
Sheriff's Substation Mt. Tremper	146-152 Mt. Pleasant Rd, Mt. Tremper, NY	2,004	N/A
Sheriff's Substation Shandaken	Town Hall, Rt. 28	N/A	N/A
Sheriff's Substation Port Ewen	Esopus Town Hall, Salem St.	N/A	N/A

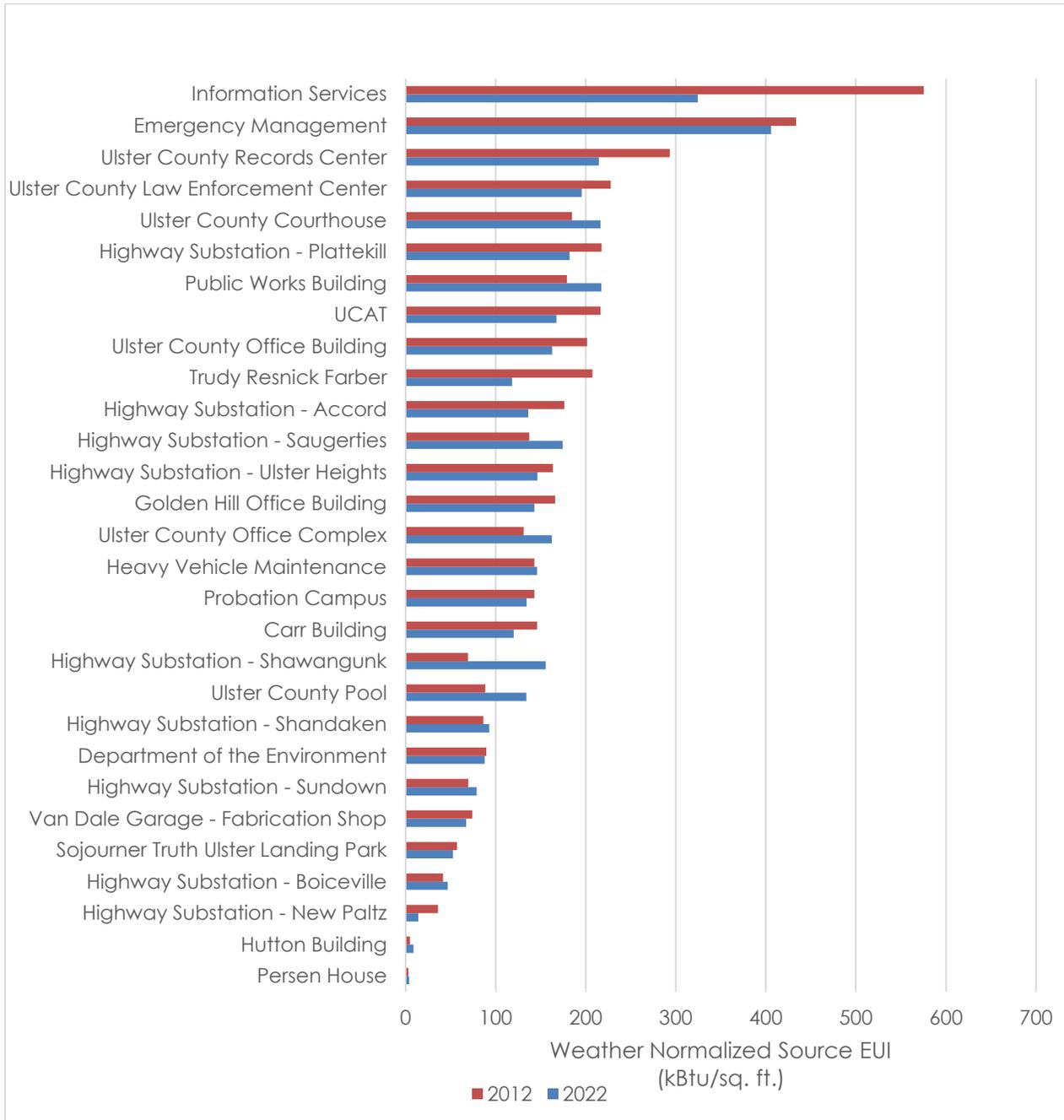
Table 4 shows the energy use intensity (per square foot) at each of the Ulster County properties reported. Energy purchased has been converted to the common unit of kBtu for comparison.

Table 4: 2022 Energy Consumption and Performance for Ulster County Properties

Property	Gross Floor Area (sq. ft.)	Sum of Source Energy Use (kBtu)	Average of Source EUI (kBtu/ft ²)	Average of Weather Normalized Site EUI (kBtu/ft ²)
21 Elizabeth St	5,742	26,499	4.6	1.6
368 Broadway	-	-	-	-
Board of Elections	-	-	-	-
Carr Building	5,438	622,483	114.5	94.3
Department of the Environment	4,229	351,786	83.2	66.9
Emergency Management	3,537	1,411,215	399	167.7
Golden Hill Office Building	39,600	5,747,377	145.1	62.9
Heavy Vehicle Maintenance	35,000	4,800,227	137.1	113.7
Highway Substation - Accord	2,324	307,697	132.4	48.6
Highway Substation - Boiceville	13,690	624,401	45.6	32.9
Highway Substation - New Paltz	13,697	195,439	14.3	5.1
Highway Substation - Plattekill	2,265	392,321	173.2	93.4
Highway Substation - Saugerties	3,552	575,994	162.2	131.2
Highway Substation - Shandaken	5,364	454,299	84.7	76
Highway Substation - Shawangunk	4,433	692,054	156.1	91.2
Highway Substation - Sundown	4,984	396,369	79.5	64.9
Highway Substation - Ulster Heights	3,545	516,705	145.8	112
Hutton Building	3,386	30,127	8.9	3.2
Information Services	13,174	4,218,482	320.2	142.8
Persen House	6,405	26,908	4.2	1.5
Probation Campus	20,724	2,756,872	133	72
Public Works Building	10,740	2,307,012	214.8	114.9
Sojourner Truth Ulster Landing Park	3,198	163,249	51	41.3
Trudy Resnick Farber	20,732	2,429,634	117.2	69.6
UCAT	23,413	3,919,583	167.4	93.8
Ulster County Courthouse	43,650	9,326,976	213.7	113.5
Ulster County Law Enforcement Center	277,000	53,730,675	194	112.7
Ulster County Office Building	62,396	9,997,406	160.2	76.1
Ulster County Office Complex	117,977	18,884,710	160.1	89.3
Ulster County Pool	7,126	1,116,174	156.6	48
Ulster County Records Center	22,550	4,732,852	209.9	112.3
Van Dale Garage - Fabrication Shop	15,146	997,780	65.9	44.3
Total	797,017	132,063,211		

Chart 1 compares the energy use intensity in 2022 to that from the County's greenhouse gas inventory baseline year of 2012. Closed properties and properties that do not have 2012 data available were excluded. The use of the weather normalized EUI metric allows for building energy performance comparisons across years with varying weather conditions.

**Chart 1: Weather Normalized Source EUI for Ulster County Properties
2012 and 2022 (for Properties with Available Energy Data)**



3. GREENHOUSE GAS EMISSIONS

Greenhouse gas emission estimates were calculated using the following conversion factors in Table 6. These factors were applied to the site energy consumption values to calculate annual emissions.

Table 6: GHG Emissions Conversion Factors⁵

Fuel Type	Conversion Factor (kg CO₂e/mmBtu)
Diesel Fuel	74.21
Electricity (eGRID Region: NYUP)	39.34
Natural Gas	53.11
Heating Oil (No. 2)	74.21
Propane	64.25

For 2022, the total GHG emissions from the operation of Ulster County buildings may differ from the emissions total from the Buildings & Other Facilities sector in the Ulster County Greenhouse Gas inventory due to: 1) the exclusion of "Other Facilities" from this report which do not have a gross floor area greater than 1,000 square feet 2) differences in emissions factors between the EPA national standard and Ulster County's methodology.

⁵ Retrieved from: <https://portfoliomanager.energystar.gov/pdf/reference/Emissions.pdf>

Chart 2: Total GHG Emissions Produced by Ulster County Properties

2012 and 2022

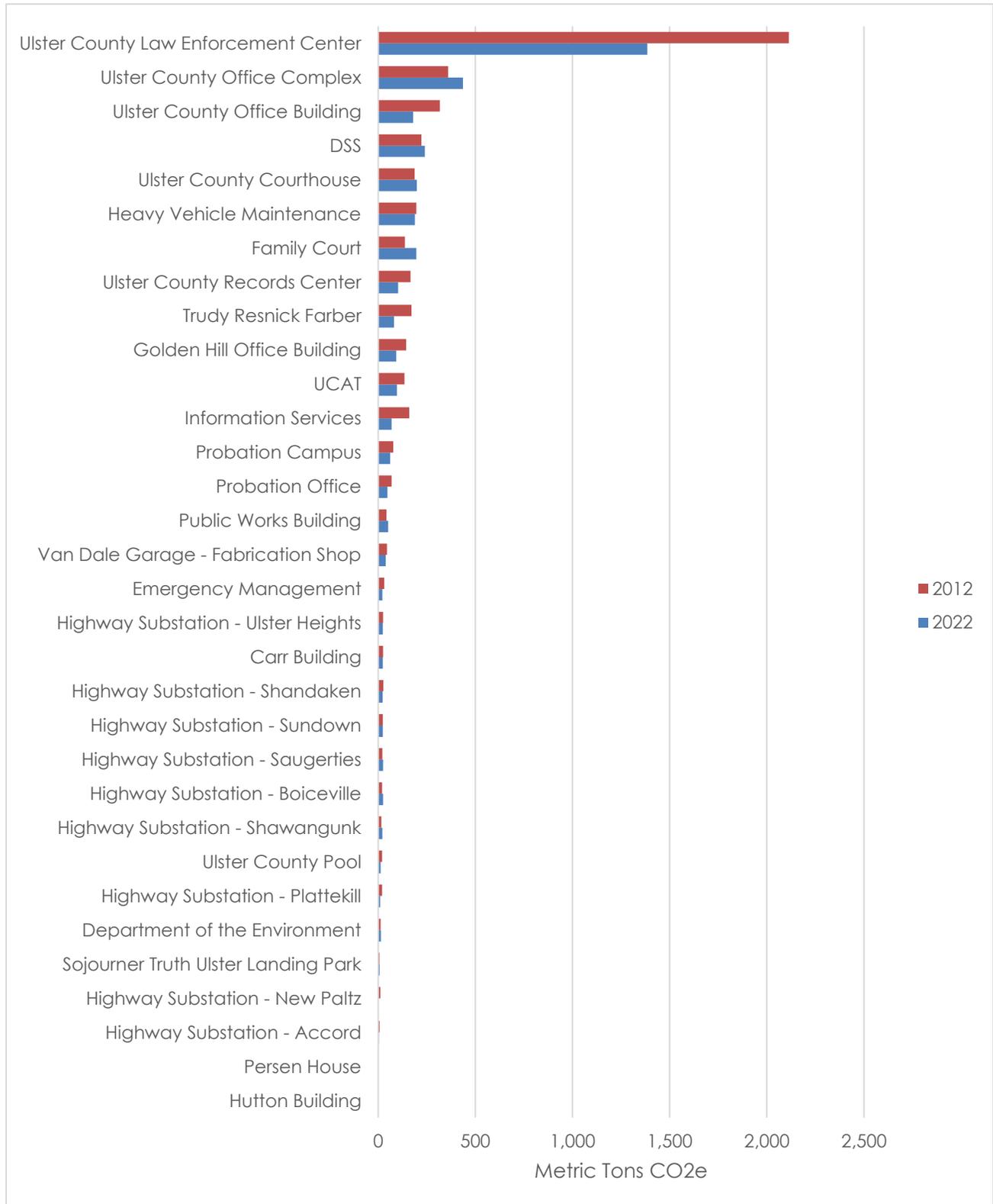
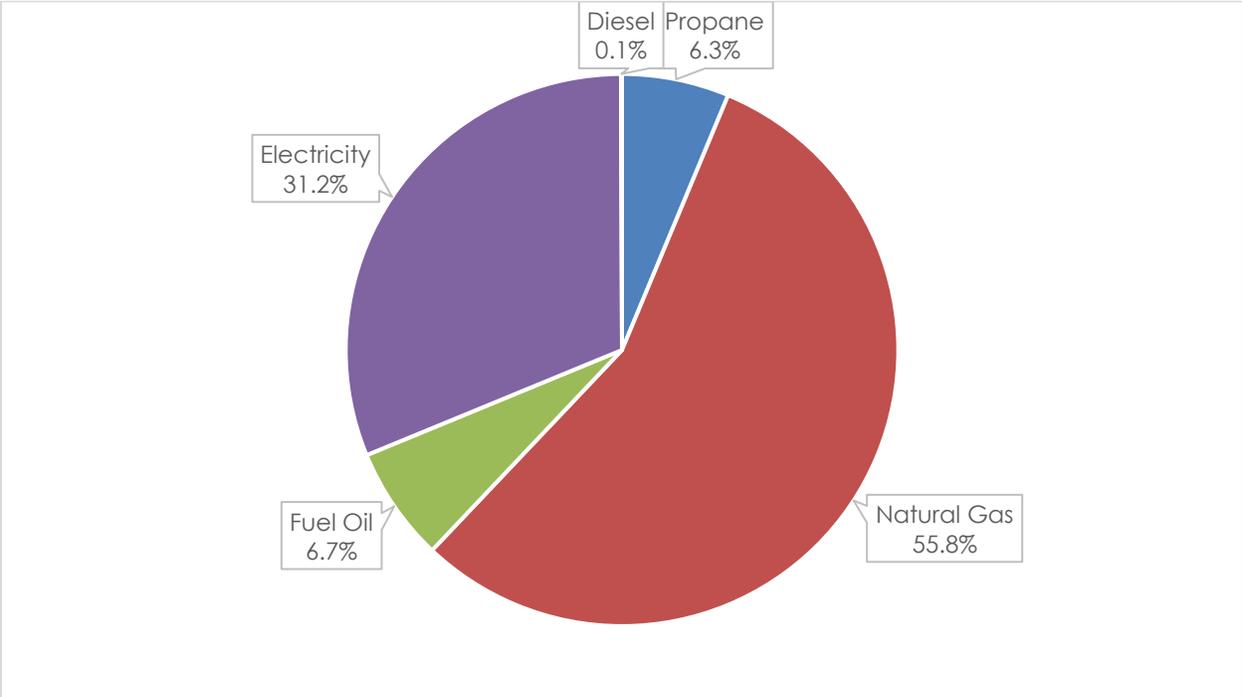


Chart 3 shows the emissions contribution of each energy type used by Ulster County in its buildings.

Chart 3: 2022 GHG Emissions by Energy Source



Appendices

Appendix A: Energy Performance Metrics

Energy Use Intensity: Energy Use Intensity (EUI) is the primary energy performance metric used by the EPA's ENERGY STAR program. EUI is the energy use per square foot at a property (kBtu/square foot) and is used to compare buildings of different sizes.

Site and Source Energy: The EPA ENERGY STAR® program distinguishes between **site** and **source energy**. **Site energy** is the usage as measured exclusively from the building, which is the quantity recorded in utility bills. **Source energy** accounts for the additional energy expenditures associated with production, transmission, and delivery of the fuel. The source energy metric allows the energy efficiencies of buildings to be compared without imparting a bias based on the type of fuel they consume. National average ratios are used within the EPA ENERGY STAR scoring system to prevent any individual building from being penalized or credited due to the relative efficiency of its energy provider.

Table 7: National Average Source-Site Ratios used in Portfolio Manager:⁶

Fuel Type	Source-Site Ratio
Electricity (Grid Purchase)	2.80
Electricity (On-site Solar)	1.00
Natural Gas	1.05
Heating Oil (No. 2)	1.01
Propane	1.01
Diesel	1.01

Weather Normalized Energy:⁷ Weather normalized energy is the energy a property would have used under average conditions (also referred to as climate normals). In a given year, the weather may be warmer or colder than the building's normal climate; weather normalized energy accounts for this difference. This allows for a better comparison of building performance over time by removing the effect of annual weather variations.

EPA 1-100 ENERGY STAR score: Some buildings can also receive a 1 – 100 ENERGY STAR score. This percentile score, calculated by Portfolio Manager, compares a building's energy performance to similar buildings nationwide. A score of 50 represents median energy performance, while a score of 75 means the building performs better than 75 percent of all similar buildings nationwide — and may be eligible for ENERGY STAR certification.

⁶ Retrieved from: <https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf>

⁷ More detail available here:

<https://portfoliomanager.energystar.gov/pdf/reference/Climate%20and%20Weather.pdf>

Appendix B: Weather Normalized Energy Usage Trends (Source EUI)

Source EUI Change from 2012 Baseline

Property	2012	2022	% Change
21 Elizabeth St	-	-	N/A
368 Broadway	-	-	N/A
Board of Elections	-	-	N/A
Carr Building	146	120.1	-18%
Department of the Environment	89.5	88	-2%
Emergency Management	433.6	405.8	-6%
Golden Hill Office Building	165.9	142.9	-14%
Heavy Vehicle Maintenance	142.9	146	2%
Highway Substation - Accord	176.2	136.2	-23%
Highway Substation - Boiceville	41.5	46.7	13%
Highway Substation - New Paltz	35.8	14.3	-60%
Highway Substation - Plattekill	217.7	182	-16%
Highway Substation - Saugerties	137.3	174.3	27%
Highway Substation - Shandaken	86.5	92.8	7%
Highway Substation - Shawangunk	69.4	155.6	124%
Highway Substation - Sundown	69.8	78.8	13%
Highway Substation - Ulster Heights	163.6	146.3	-11%
Hutton Building	4.9	8.9	82%
Information Services	575.4	324.3	-44%
Persen House	3	4.1	37%
Probation Campus	142.9	134.3	-6%
Public Works Building	179.2	217.4	21%
Sojourner Truth Ulster Landing Park	57.1	52.6	-8%
Trudy Resnick Farber	207.6	118.2	-43%
UCAT	216.5	167.4	-23%
Ulster County Courthouse	184.9	216.5	17%
Ulster County Law Enforcement Center	227.9	195.5	-14%
Ulster County Office Building	201.4	162.7	-19%
Ulster County Office Complex	131	162.5	24%
Ulster County Pool	88.4	134.1	52%
Ulster County Records Center	293.3	214.6	-27%
Van Dale Garage - Fabrication Shop	74	67.3	-9%

Appendix C: GHG Emissions Trends

GHG Emissions Change from 2012 Baseline

Note: GHG trends shown only for buildings with energy data from 2012 through present. N/A indicates that 2022 data is unavailable or incomplete.

Property	2012	2022	% Change
21 Elizabeth St	-	-	N/A
368 Broadway	-	-	N/A
Board of Elections	-	-	N/A
Carr Building	24.5	23.8	-3%
Department of the Environment	12.5	13	4%
Emergency Management	31.2	21.3	-32%
Golden Hill Office Building	144	92.2	-36%
Heavy Vehicle Maintenance	196.6	188.7	-4%
Highway Substation - Accord	6.8	3.4	-50%
Highway Substation - Boiceville	20.2	25.3	25%
Highway Substation - New Paltz	11.4	2.2	-81%
Highway Substation - Plattekill	19.6	9.7	-51%
Highway Substation - Saugerties	20.7	25	21%
Highway Substation - Shandaken	25.4	22.4	-12%
Highway Substation - Shawangunk	16.1	20.9	30%
Highway Substation - Sundown	23.1	22.9	-1%
Highway Substation - Ulster Heights	25.1	23.3	-7%
Hutton Building	0.3	0.3	0%
Information Services	160.3	68.3	-57%
Persen House	0.4	0.3	-25%
Probation Campus	76.9	61.2	-20%
Public Works Building	42.8	51	19%
Sojourner Truth Ulster Landing Park	6.3	7.5	19%
Trudy Resnick Farber	170.6	81.5	-52%
UCAT	134.8	96.5	-28%
Ulster County Courthouse	187.5	199	6%
Ulster County Law Enforcement Center	2113.5	1384.6	-34%
Ulster County Office Building	317.4	179.4	-43%
Ulster County Office Complex	359.2	435.9	21%
Ulster County Pool	19.5	12.4	-36%
Ulster County Records Center	166.2	102.6	-38%
Van Dale Garage - Fabrication Shop	45.2	38.9	-14%