



Project Name & Location

Example Estates 1234 Main Street, Madison, WI 53713

Site Contacts

John Doe

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Reserve Advisors Contacts

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Example Estates Madison, WI

Dear Board of Directors of Example Estates,

At the direction of the Board that recognizes the need for proper energy planning, we have conducted an Energy Audit ASHRAE Level II for Example Estates in Madison, WI and submit our findings in this report. The effective date of this study is May 1, 2023.

The scope of this audit adheres to the guidelines developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) for a Level II audit. As described in ASHRAE's Procedures for Commercial Building Energy Audits, a Level II "Energy Survey and Analysis" will identify and provide the savings and cost analyses of all practical energy efficiency measures that meet the owner's/operator's constraints and economic criteria, along with the proposed changes to Operation and Maintenance (O&M) procedures.

An ongoing review by the Board and an Update of this Energy Audit are necessary to continually monitor and improve usage. We recommend the Board budget for an Update to this Energy Audit in five years. We look forward to continuing to help Example Estates plan for a successful future.

As part of our long-term thinking and everyday commitment to our clients, we are available to answer any questions you may have regarding this audit.

Respectfully submitted on May 24, 2023 by

Reserve Advisors, LLC

Analysis and Report by: Nicholas Julia, Certified Energy Manager

Review by: Fred Alatalo, P.E., Director of Energy Services



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Executive Summary

Client: Example Estates

Location: Madison, WI

Reference: 123456

Property Description: Example Estates consists of 72 units in a 7-story building. The building was

built in 2002.

Assessment Date: May 1, 2023

Assessment Completed: ASHRAE Level II - Energy Survey and Analysis

Methodology: The purpose of this report is to identify cost effective Energy Conservation Measures (ECMs) to reduce energy consumption and greenhouse gas (GHG) emissions at Example Estates Building. The energy efficiency opportunities identified herein encompass both capital projects and low-cost operational and maintenance (O&M) items. All identified opportunities are estimates only, which will result in highlighting projects for further investigation and support project prioritizing. In most cases, further investigation is required to quantify potential savings and vendor quotes for project costs should be obtained to fully evaluate measure feasibility.

Current Usage:

- The Example Estates Building presently consumes about 3,228,516 kWh annually. The average annual cost of this energy is about \$253,188.
- The Example Estates Building facility presently consumes about 67,838 therms annually. The
 average annual cost of this energy is about \$52,100. See the "Facility Energy Use" section for
 more information on energy consumption.

Savings Summary: We recommend 10 energy conservation measures (ECM's) with equivalent savings of 414,395 kWh in electricity and 12,865 therms in gas for Example Estates. The total cost to implement these measures is \$217,831. We estimate implementation of all of these measures would amount to annual savings of \$45,687 with an average simple payback period of 4.8 years. This represents a reduction of 15.31% in total energy costs for the property.

Energy Star Score Project Improvement: The following table summarizes the projected improvement to the Energy Star Score based on the recommended energy conservation measure (ECM). Each measure was evaluated individually and did not consider interactive effects of installing multiple measures. Interactive effects should be considered if a set of measures are selected for detailed study.



Summary of Proposed Energy Savings

Proposed Measure	Est. Electric Savings (kWh)	Est. Gas Savings (therms)	Est. Water Savings (kGal)	Est. Energy Savings (kBtu)	Current Energy Star Score	Proposed Energy Star Score	Energy Star Score Improvement
Replace Desktop Printer with Office Printer	1,922	-	-	6,558	78	78	0
Central Air Conditioning Tune Up	28,197	-	-	96,208	78	78	3
Install Smart Thermostat	53,867	2,682	-	451,960	78	79	9
Install Kitchen Demand Ventilation Controls	6,662	794	-	102,106	78	79	3
Install Low Flow Showerheads	-	1,636	1.876	163,605	78	80	4
Install High Efficiency/Low Pressure Irrigation System	2,496	-	-	8,516	78	78	0
Install Low Flow Faucet Aerators	-	832	0.438	83,223	78	81	2
Replace Freezer/Refrigerator with EnergyStar	47,041	-	-	160,505	78	83	5
Replace Window in Common Area and Gym	10,435	6,921	-	727,530	78	80	13
Reduce Lighting System Wattage (simplified)	263,775	-	-	900,000	78	83	15
Total	414,395	12,865	2.314	2,700,211			



Summary of Proposed Cost Savings

Proposed Measure	Annual Cost Savings (\$)	Total Measure Cost (\$)	Estimated Incentive (\$)	Simple Payback (years)
Replace Desktop Printer with Office Printer	215	896	240	3.1
Central Air Conditioning Tune Up	2,211	1,440		0.7
Install Smart Thermostat	6,284	12,000	1,500	1.7
Install Kitchen Demand Ventilation Controls	1,998	4,000	400	1.8
Install Low Flow Showerheads	2,657	10,000	2,600	2.8
Install VFD on Irrigation System	197	3,000	160	14.5
Install Low Flow Faucet Aerators	1,352	38,480	4,600	> 20 years
Replace Freezer/Refrigerator with EnergyStar	5,250	69,120	21,600	9.1
Replace Window in Common Area and Gym	6,136	104,880	3,960	16.5
Reduce Lighting System Wattage (simplified)	20,739	12,495	400	8.5
Total	45,687	217,831	31,388	4.8



Facility Description



Example Estates consists of 72-units in a seven-story building with approximately 189,000-square feet. The building was built in 2002. A breakdown of the floors is as follows:

- Basement consists of on-grade parking
- Floor 1 includes the lobby, community room and upper parking
- Floors 2-7 include the residential units and corridors

The building heating, ventilation and air conditioning system consists of one rooftop heating and cooling unit to serve the corridors and individual split systems to serve the units and lobby. Unit heaters serve the garage floors.

The domestic water system consists of three boilers and one storage tank, both located in the lower garage. The system includes two booster pumps with controls and variable frequency drives for water circulation.



Historic Energy Use

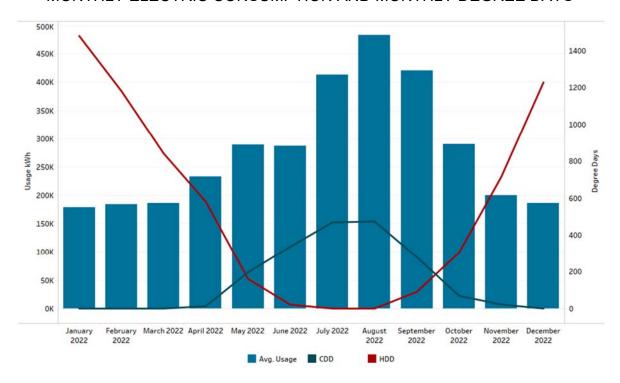
The following sections present the historical energy use within the facility. Additionally, a weather sensitivity analysis is presented for the purpose of demonstrating the impact of outdoor air temperatures (OAT) on energy use. For this report, the weather sensitivity analysis will provide insight as to whether weather is a driver for how the facility consumes energy throughout the year.

Electrical Billing Summary and Weather Analysis

The Example Estates Building facility presently consumes about 3,349,876 kWh annually. The average annual cost of this energy is about \$263,304. The following exhibit shows recent consumption from utility bills and the monthly average outdoor air temperature with heating degree days (HDD) and cooling degree days (CDD) displayed on the graph.

	Total Usage (kWh)	Electric Usage Cost (\$)	Electricity EUI (kWh/SqFt)
2022	3,349,876	263,304	17.7

MONTHLY ELECTRIC CONSUMPTION AND MONTHLY DEGREE DAYS



Electricity Average Blended Rate: \$0.0784 /kWh

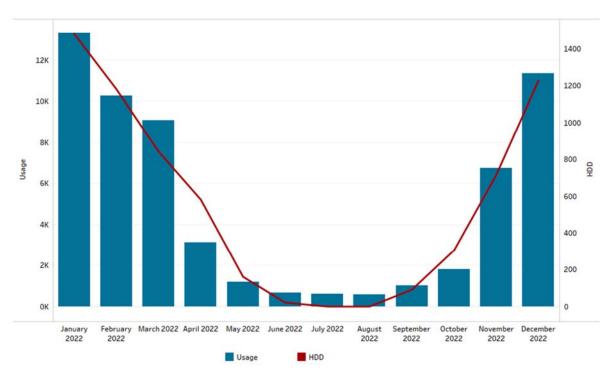


Natural Gas Billing Summary and Weather Analysis

The Example Estates Building facility presently consumes about 59,668 therms annually. The average annual cost of this energy is about \$45,825. The following exhibit shows recent consumption data from utility bills and the monthly average outdoor air temperature with heating degree days (HDD) displayed on the graph.

	Natural Gas Usage (therms)	Natural Gas Usage Cost (\$)	Natural Gas EUI (Therms/SqFt)
2022	59,668	45,825	.32

MONTHLY NATURAL GAS CONSUMPTION AND MONTHLY DEGREE DAYS



Natural Gas Average Blended Rate: \$0.768 /therm



Energy End Use Breakdown

The energy end-use breakdown presented in this section has been collected from extensive surveys conducted by Reserve Advisors presented in the report. This survey resulted in determining the typical energy consumption breakdown for various commercial buildings based on building activity type and climate zone. The following figure describes this facility's estimated energy end-use breakdown based on the facility type.

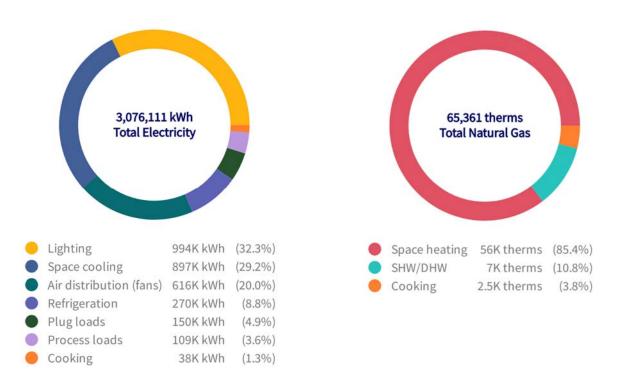
End Use	Electric Usage (kWh)	Natural Gas Usage (therms)	Total Use (kBtu)	Percentages
Space Heating	0	55,821	5,582,080	33%
Space Cooling	897,494	-	3,062,283	18%
Air Distribution	616,439	-	2,103,311	12%
SHW/DHW	0	7,027	702,732	4%
Cooking	38,496	2,513	382,615	2%
Lighting	994,432	-	3,393,041	20%
Plug Load	149,758	-	510,981	3%
Process Load	109,492	0	373,589	2%
Water Distribution	0	-	0	0%
Conveyance	0	-	0	0%
Refrigeration	270,000	-	921,250	6%
IT	0	-	0	0%
Other	0	0	0	0%
Ventilation	0	-	0	0%
Total	3,076,111	65,361	17,031,882	100%
Historical Billing	3,349,875	59,668	17,396,573.5	-
Actual	91.82%	109.54%	97.9%	-

Table: Energy End-Use Breakdown

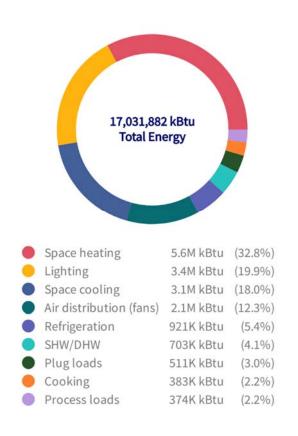


Electric End Use Breakdown

Natural Gas End Use Breakdown



Energy Usage - All Fuels





Benchmarking

The energy use intensity (EUI) of a building is defined as the total annual energy used by the facility divided by total floor area. This value is used to compare the building energy performance to similar buildings based on size, usage and geographic location. Similarly, the *Energy Star Score* provides a snapshot of each building's energy performance based on a percentile comparison basis. This metric is shown on a scale of 1 to 100 with the higher scores representing a higher energy performance building. Benchmark values are determined from The United States Energy Information Administration's Commercial Building Energy Consumption Survey (CBECS) report. The exhibits below present the benchmark for this facility along with its actual EUI, current Energy Star Score, and predicted Energy Star Score once ECM's are implemented. For this report, we benchmarked Example Estates Building against Multifamily Housing. Variations in your building's use and actual hours of operation compared to averages of similar facility types can significantly affect values.

	Site EUI (kBtu/SqFt)	CBECs Median EUI - AII Sources (kBtu/SqFt)	Electricity EUI (kWh/SqFt)	CBECs Median Electricity EUI (kWh/SqFt)	Natural Gas EUI (Therms/SqFt)	CBECs Median Natural Gas EUI (Therms/SqFt)
2022	90	93	17.7	11	.32	1

⁻ The lower the EUI, the more efficient the building. Lowering your EUI is essential to meeting current and/or future city and county ordinances

	Energy Star Score	Median Energy Star Score for Multifamily Building
2022	78	66



Calculated Energy Savings Opportunities

All energy savings estimates are based on facility provided information and assumptions of typical energy use. Project costs presented in this report are estimates based on consumer reference data. For detailed project costs, it is recommended to obtain a quote from the appropriate contractor or vendor.

If all ECMs are implemented, the facility can expect to reduce electricity consumption by 414,395 kWh, natural gas consumption by 12,865 therms. The full implementation cost of these projects is estimated at \$217,831, yielding a simple payback of 11 years. The following table depicts expected savings figures for this facility:

Summary of Energy Savings

Energy	Electricity (kWh)	Natural Gas (therms)	Site EUI	Total GHG Emissions (mtCO2e)
Baseline	3,076,006	65,361	90.12	2,635
Proposed	2,664,776	53,327	76.32	2,266
Reduction (%)	13.37%	18.41%	15.31%	14%

Energy Savings by End Use

End Use	Electricity Usage	Electricity Savings (kWh)	Natural Gas Usage	Natural Gas Savings (therms)	Total Existing Energy Consumption (kBtu)	Total Proposed Energy Consumption (kBtu)	% Reduction
Space Heating	0	-	55,821	12,865	5,582,080	4,621,760	17.2%
Space Cooling	897,494	94,995	-	-	3,062,283	2,738,157	10.58%
Air Distribution	616,439	0	-	-	2,103,311	2,103,311	0%
SHW/DHW	0	0	7,027	0	702,732	702,732	0%
Cooking	38,496	0	2,513	0	382,615	382,615	0%
Lighting	994,432	260,607	-	-	3,393,041	2,503,850	26.21%
Plug Load	149,758	1,922	-	-	510,981	504,423	1.28%
Process Load	109,492	0	0	0	373,589	373,589	0%
Water Distribution	0	0	-	-	0	0	-
Conveyance	0	0	-	-	0	0	-
Refrigeration	270,000	47,042	-	-	921,250	760,743	17.42%



End Use	Electricity Usage	Electricity Savings (kWh)	Natural Gas Usage	Natural Gas Savings (therms)	Total Existing Energy Consumption (kBtu)	Total Proposed Energy Consumption (kBtu)	% Reduction
IT	0	0	-	-	0	0	-
Other	0	0	0	0	0	0	-
Ventilation	0	0	_	-	0	0	-
Total	3,076,006	411,230	65,361	12,865	17,031,883	14,425,408	15.3%



Energy Conservation Measures

Envelope

Window Replacement in Common Area and Gym

This measure will estimate your savings for installing new windows with improvements in U-value.

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings	
(kWH)	(therms)	(kBtu)	(mtCO2e)	
10,435	6,920	727,530	44.44	

Cost Benefit Analysis			
Annual Cost Savings (\$)	6,136	Simple Payback (yrs)	16.4
Total Measure Cost (\$)	104,880	ROI (%)	6.1
Incentive (\$)	3,960		-

Heating & Cooling

Install VFD on Irrigation System

Install a variable frequency drive (VFD) your current single speed irrigation pump.

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWH)	(therms)	(kBtu)	(mtCO2e)
2,495	-	8,516	1.86

Cost Benefit Analysis			
Annual Cost Savings (\$)	197	Simple Payback (yrs)	14.5
Total Measure Cost (\$)	3,000	ROI (%)	6.9
Incentive (\$)	160		-



Install Smart Thermostat

This measure covers the installation of ENERGY STAR® qualified smart thermostats with behavioral learning capabilities applied to single-family and multi-family residential HVAC systems

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWH)	(therms)	(kBtu)	(mtCO2e)
53,866	2,682	451,960	54.29

Cost Benefit Analysis			
Annual Cost Savings (\$)	6,284	Simple Payback (yrs)	1.7
Total Measure Cost (\$)	12,000	ROI (%)	59.8
Incentive (\$)	1,500		_

Central Air Conditioning Tune Up

This measure estimates savings for a central AC "tune-up".

Electric Sa		Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWF		(therms)	(kBtu)	(mtCO2e)
	28,196	-	96,208	20.98

Cost Benefit Analysis			
Annual Cost Savings (\$)	2,211	Simple Payback (yrs)	0.7
Total Measure Cost (\$)	1,440	ROI (%)	153.5
Incentive (\$)			-



Kitchen

Kitchen Demand Ventilation Controls

This measure estimates savings when commercial kitchen demand ventilation controls are installed. DVC's vary the kitchen ventilation exhaust and make-up airflow based on cooking load and/or time of day.

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWH)	(therms)	(kBtu)	(mtCO2e)
6,662	793	102,106	

Cost Benefit Analysis			
Annual Cost Savings (\$)	1,998	Simple Payback (yrs)	1.8
Total Measure Cost (\$)	4,000	ROI (%)	55.5
Incentive (\$)	400		-

Lighting

Reduce Lighting System Wattage (simplified)

Reduce wattage by switching to different bulbs or switching lighting technology. This project does not account for increased heating and decreased cooling due to wattage reduction.

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWH)	(therms)	(kBtu)	(mtCO2e)
263,775	0	900,000	

Cost Benefit Analysis			
Annual Cost Savings (\$)	20,739	Simple Payback (yrs)	8.5
Total Measure Cost (\$)	12,495	ROI (%)	140.1
Incentive (\$)	400		-



Plug Load

Replace Desktop Printer with Office Printer

Replace desktop printers with a more efficient office printer in order to save energy.

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWH)	(therms)	(kBtu)	(mtCO2e)
1,922	-	6,558	1.43

Cost Benefit Analysis			
Annual Cost Savings (\$)	215	Simple Payback (yrs)	3.1
Total Measure Cost (\$)	896	ROI (%)	32.8
Incentive (\$)	240		-

Refrigeration

Energy Star Freezer/Refrigerator

This measure applies to ENERGY STAR vertical closed and horizontal closed refrigerators or freezers installed in a commercial kitchen

Electric Savings	Natural Gas Savings	Energy Savings	Estimated GHG Savings
(kWH)	(therms)	(kBtu)	(mtCO2e)
47.041	-	160.505	

Cost Benefit Analysis			
Annual Cost Savings (\$)	5,250	Simple Payback (yrs)	9.1
Total Measure Cost (\$)	69,120	ROI (%)	11
Incentive (\$)	21,600		-



Incentive (\$)

Water Conservation Measures

Water Use

Low Flow Showerheads

This measure estimates savings for replacing your current showerhead with a more efficient, low-flow showerhead.

Water Savings (kGal)	Electric Savings	(kWh)	Natural Gas Savi	ngs (therms)
1.3433		-		1,636
Cost Benefit Analysis				
Annual Cost Savings (\$)	2,657	Simple Payba	ck (yrs)	2.8
Total Measure Cost (\$)	10,000	ROI (%)		35.9

2,600

Bath Low Flow Faucet Aerators

This measure relates to the direct installation of a low flow faucet aerator in a commercial building.

Water Savings (kGal)	Electric Savings (kWh)	Natural Gas Savings (therms)
0.438	_	832

Cost Benefit Analysis			
Annual Cost Savings (\$)	1,352	Simple Payback (yrs)	> 20 years
Total Measure Cost (\$)	38,480	ROI (%)	4
Incentive (\$)	4,600		-



APPENDIX A - Energy Usage History Electric Consumption & Costs

<u> </u>				
	Electric Usage (kWh)	Electric Usage Cost (\$)		
	2022	2022		
Jan	179,268.67	14,094.33		
Feb	183,675	14,440.33		
Mar	186,155.33	14,629.33		
Apr	233,175	18,328.33		
May	289,423.33	22,748.33		
Jun	286,535	22,525.33		
Jul	412,858	32,450		
Aug	483,226	37,980		
Sep	420,039	33,012		
Oct	289,839.33	22,781.67		
Nov	199,871	15,711.67		
Dec	185,810	14,602.67		
Total	3,349,875.66	263,303.99		



Natural Gas Consumption & Costs

	Natural Gas Usage (therms)	Natural Gas Usage Cost (\$)
	2022	2022
Jan	13,308.76	10221.13
Feb	10,254.53	7875.479
Mar	9,077.91	6971.835
Apr	3,111.28	2389.463
May	1,193.75	916.8
Jun	652.88	501.4118
Jul	597	458.496
Aug	574.5	441.216
Sep	1,020.2	783.5136
Oct	1,795.47	1378.921
Nov	6,738.01	5174.792
Dec	11,343.97	8712.169
Total	59,668.26	45825.22



Water Consumption & Costs

	Water Usage (ccf)	Water Usage Cost (\$)		
	2022	2022		
Jan	324,964.29	1,950.84		
Feb	535,642.86	2,823.53		
Mar	412,211.04	2,187.12		
Apr	315,078.37	1,940.64		
May	278,370.11	1,932.58		
Jun	417,369.7	2,169.4		
Jul	382,435.06	2,439.01		
Aug	287,487.39	1,704.9		
Sep	516,130.83	2,903.4		
Oct	458,896.55	2,700.54		
Nov	522,788.79	3,288.24		
Dec	319,721.77	2,346.38		
Total	4,771,096.76	28,386.58		



APPENDIX B - Utility Rates & Incentives

Electricity Average Blended Rate: \$0.0786 /kWh

Natural Gas Average Blended Rate: \$0.768 /therm

Water Average Blended Rate \$0.01/ccf



APPENDIX C – Site Equipment

Building Envelope

Application	Wall	Name	R-Value	Comments
Wall	-	Mass Wall R-11	12.54	24 o.c. framing

Application	Roof	Name	R-Value	Comments
Roof	_	IEAD Roof R- 15	15.37	-

Application	Window	Name	U-Value	Comments
Window	-	Single Glazing - Aluminum Frame (no thermal break)	1.23	-

Application	Exterior floor	Name	R-Value	Comments
Exterior Floor	_	Mass Floor R-11	12.49	_

Controls

Name	Quantity
Thermostat	74





Cooling

Name	Quantity
Air Conditioners	74





Heating

Name	Quantity
Boilers	2





Heating & Cooling

Name	Quantity
Rooftop Unit	2



Kitchen

Name	Quantity
Oven & Range	72





Name	Quantity
Refrigerator	72



Laundry

Name	Quantity
Washers & Dryers	8





Lighting

Name	Quantity
Unit Light Fixture	80



Name	Quantity
Hallway Light Fixture	140





Name	Quantity
Outdoor Light Fixture	40



Water Heating

Quantity Name 3

Water Heaters





Water Use

Name	Quantity
Faucet Aerator	322



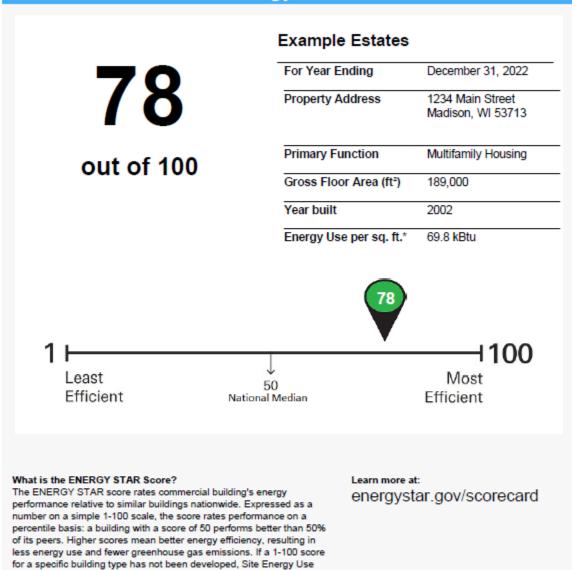
Name	Quantity
Shower Head	260





APPENDIX D - Energy Star Score

ENERGY STAR[®] Energy Performance Scorecard



*Site energy use



Intensity (EUI) will be displayed on this scorecard.

Date Generated: February 14, 2023



APPENDIX E - Credentials

Founded in 1991, Reserve Advisors provides engineering consulting services including, but not limited to, reserve studies, insurance appraisals, developer turnover transition studies, expert witness services and energy services. The **engineering consulting firm** was formed to take a leadership role in helping fiduciaries, boards, and property managers manage their property like a business with a long-range plan for capital projects and property wellness.

Reserve Advisors has conducted inspections for a multitude of different communities and building types. We've analyzed thousands of buildings, from as small as a 3,500-square foot day care center to a 2,600,000-square foot 98-story highrise. We also routinely inspect buildings with various types of mechanical systems from as simple as electric heat, to complex systems with air handlers, chillers, cooling towers and boilers.

As consulting specialists, our **independent opinion** eliminates any real or perceived conflict of interest because we do not conduct or manage capital projects. **Our goal** is to help our clients fulfill their fiduciary responsibilities, recommend energy savings opportunities, and to maintain the property in good condition.

FRED ALATALO

Director of Energy Services

CURRENT CLIENT SERVICES

As Director of Energy Services, Mr. Alatalo is responsible for leading the firm's energy strategy, including product development and go-to-market, for multifamily properties.

PRIOR RELEVANT EXPERIENCE

Fred has spent the bulk of his career in energy efficiency program management including serving as the Director of Operations for all of the business energy efficiency programs for Consumers Energy (\$100 million budget and 150 staff). He has supervised several programs that were responsible for completing over 35,000 energy audits for all types of customers including multifamily, small business, large commercial and industrial. In addition, Fred managed a variety of technical service programs including retro-commissioning, energy star, new construction, small business, multi-family and pilot programs. Fred has also served as VP of C&I Innovation and VP of Engineering Services Strategy for Franklin Energy where he managed the development and promotion of new energy services.

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

Professional Engineer (PE) - Michigan



NICHOLAS JULIA

Regional Engineering Manager, Northeast Region

CURRENT CLIENT SERVICES

Nicholas R. Julia, a Civil Engineer, is an Advisor for Reserve Advisors, LLC. Mr. Julia is responsible for the inspection and analysis of the condition of clients' property, and recommending engineering solutions to increase energy efficiency or prolong the lives of the components. He also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. He is responsible for conducting Life Cycle Cost Analysis and Capital Replacement Forecast services and the preparation of Reserve Study Reports and Energy Audits for multifamily communities, condominiums, townhomes and homeowner associations.



EDUCATION

Marquette University - B.S. Civil Engineering

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

Engineer in Training (E.I.T.) – Washington D.C.

Reserve Specialist (RS) - Community Association Institute

JOSEPH COFFEE

Engineer

CURRENT CLIENT SERVICES

Joseph Coffee, is an engineer for Reserve Advisors, LLC. Mr. Coffee is responsible for the inspection and analysis of the condition of clients' property, and recommending engineering solutions to increase energy efficiency or prolong the lives of the components. He also forecasts capital expenditures for the repair and/or replacement of the property components and prepares technical reports on assignments. He is responsible for conducting Life Cycle Cost Analysis and Capital Replacement Forecast services and the preparation of Reserve Study Reports and Energy Audits for multifamily communities, condominiums, townhomes and homeowner associations.



EDUCATION

Embry-Riddle Aeronautical University - B.S. Civil Engineering

PROFESSIONAL AFFILIATIONS/DESIGNATIONS

Reserve Specialist (RS) - Community Association Institute



RESOURCES

Reserve Advisors utilizes numerous resources of national and local data to conduct its Professional Services. A concise list of several of these resources follows:

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., devoted to the arts and sciences of heating, ventilation, air conditioning and refrigeration; recognized as the foremost, authoritative, timely and responsive source of technical and educational information, standards and guidelines, found on the web at www.ashrae.org. Reserve Advisors actively participates in its local chapter and holds individual memberships.

<u>Michigan Energy Measures Database</u> (MEMD) provides users with accurate information on technologies or measures that could be used in an energy efficiency program and for integrated resource planning (IRP).

<u>National Renewable Energy Laboratory</u> (NREL) specializes in the research and development of renewable energy, energy efficiency, energy systems integration, and sustainable transportation found on the web at www.nrel.gov_

R.S. Means CostWorks, North America's leading supplier of construction cost information. As a member of the Construction Market Data Group, Means provides accurate and up-to-date cost information that helps owners, developers, architects, engineers, contractors and others to carefully and precisely project and control the cost of both new building construction and renovation projects found on the web at www.rsmeans.com.

Reserve Advisors' library of numerous periodicals relating to reserve studies, condition analyses, chapter community associations, and historical costs from thousands of capital repair and replacement projects, and product literature from manufacturers of building products and building systems



APPENDIX F - Definitions

ENERGY STAR SCORE is a measure of how well your property is performing relative to similar properties, when normalized for climate and operational characteristics. The ENERGY STAR scores are based on data from national building energy consumption surveys, and this allows Portfolio Manager to control for key variables affecting a building's energy performance, including climate, hours of operation, and building size. What this means is that buildings from around the country, with different operating parameters and subject to different weather patterns, can be compared side-by-side in order to see how they stack up in terms of energy performance. The specific factors that are included in this normalization (Hours, Workers, Climate, etc) will depend on the property type. The 1-100 scale is set so that 1 represents the worst performing buildings and 100 represents the best performing buildings. A score of 50 indicates that a building is performing at the national median, taking into account its size, location, and operating parameters. A score of 75 indicates that a property is performing in the 75th percentile and may be eligible to earn ENERGY STAR Certification.

ENERGY USE INTENSITY (EUI) is the annual energy use per square foot of a property (energy divided by square foot per year). EUI enables you to compare different sized buildings. There are many versions of EUI available in the metrics of Portfolio Manager: Site EUI, Source EUI, Weather Normalized Site EUI, Weather Normalized Source EUI, National Median Site EUI, and National Median Source EUI. For this report, Site EUI is utilized.

GREENHOUSE GAS (GHG) Emissions are the carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) gases released into the atmosphere as a result of energy consumption at the property. GHG emissions are expressed in carbon dioxide equivalent (CO2e), a universal unit of measure that combines the quantity and global warming potential of each greenhouse gas. Emissions in this report are given in four categories, Scopes One, Two, and Three (defined on the previous page), each available as a total amount in metric tons (Metric Tons CO2e).

GROSS FLOOR AREA (GFA) is the total property square footage, measured between the outside surface of the exterior walls of the building(s). This includes all areas inside the building(s) including supporting areas. GFA is not the same as rentable space, but rather includes all area inside the building(s).

KBTU - The British thermal unit (Btu or BTU) is a unit of heat, defined as the amount of heat needed to raise the temperature of one pound of water by one degree Fahrenheit. In this report, energy is reported in KBtu, or thousand British thermal units.

NATIONAL MEDIAN - the median reference point for your property based on the 2003 Commercial Building Energy Consumption Survey (CBECS). The national median is a commonly used benchmark: 50% of properties perform below the median, and 50% perform above the median. The exact way the median is determined will depend on your property: If your property has an ENERGY STAR score - The national median is the EUI that will give your specific property an ENERGY STAR score of 50. This means the median is normalized to account for weather and property type, telling you what a median building with your activities would consume. Using the median EUI for a score of



50, other metrics like the equivalent cost and GHG emissions at the median can be computed. If your property does not have an ENERGY STAR score - The national median is the EUI from CBECS, without any normalization.

PASSENGER (PSGR) - Used interchangeably in this report with commuter.

PORTFOLIO MANAGER - is an online tool that can used to measure and track energy and water consumption, as well as greenhouse gas emissions. It is used to benchmark the performance of one building or a whole portfolio of buildings, all in a secure online environment.

PROPERTY TYPE - indicates the single, primary use of a property as defined by Portfolio Manager.

SITE ENERGY USE - the annual amount of all the energy your property consumes onsite, as reported on your utility bills. Use Site Energy to understand how the energy use for an individual property has changed over time. Site Energy is available in a number of different formats, such as:

SITE EUI – The Site Energy Use divided by the property square foot.

WEATHER NORMALIZED SITE ENERGY - the energy use your property would have consumed during 30-year average weather conditions. For example, if 2012 was a very hot year, then your Weather Normalized Site Energy may be lower than your Site Energy Use, because you would have used less energy if it had not been so hot. It can be helpful to use this weather normalized value to understand changes in energy use when accounting for changes in weather. Weather Normalized Site EUI is also available (i.e. Weather Normalized Site Energy divided by property size or by flow through a water/wastewater treatment plant).

SOURCE ENERGY USE - Source Energy Use is the total amount of raw fuel that is required to operate your property. In addition to what the property consumes on-site, source energy includes losses that take place during generation, transmission, and distribution of the energy, thereby enabling a complete assessment of energy consumption resulting from building operations.

WATER USE INTENSITY (WUI) - the water used per square foot at a property (water divided by square foot). EUI enables you to compare different sized buildings.



APPENDIX G - Calculations

Calculation Methodology

The following is intended to provide the basis for calculating a building's end use breakdown from asset and operations data.

Heating and cooling end uses may be estimated using a linear regression approach and the building's utility bills. This approach is detailed in the ASHRAE Handbook of Fundamentals Chapter 19.17 as well as a more advanced method called the Bin Method in Chapter 19.19. Since heating is seasonal but water heating and cooking generally operate at a constant level throughout the year, the "base load" natural gas use may be estimated from utility bills and one can assume that the base load is entirely made up of water heating and cooking. As an alternative to the regression analysis, electric space heating, cooling and DHW consumption may be determined through equipment and building specifications documented and sourced through the "2012 Commercial Buildings Energy Consumption Survey: End Use Energy Model Documentation".

Next, we calculate the annual consumption for generic equipment and equipment with electric motors, as documented in 2019 ASHRAE Handbook—HVAC Applications, Chapter 37, "ENERGY AND WATER USE AND MANAGEMENT". Generic equipment annual consumption may be estimated directly if the annual operating hours for the equipment are known. While in operation, most electrical equipment draws a constant electric demand. Equipment utilizing variable speed drives have the ability to adjust the demand to achieve different loads; one should use "equivalent full load hours" when estimating consumption instead. Electric motors operate similar to generic electrical equipment with two important differences; first, part of the electrical energy consumed by the motor is lost as heat and must be accounted for, and second the motor capacity itself is generally described in horsepower which must be converted to kW first.

After calculating the consumption of all equipment; the total consumption for all equipment for a given end use designation should be summed. After summing the consumption for all equipment of a given end use, convert the total consumption to kBtus - we are casting all values to a common unit in order to compare consumption across fuel types and calculate the end use breakdown in percentages. Within the analysis tables, the assessed energy consumption is compared against historical consumption data to ensure alignment and accuracy.

Savings Calculation Methodology

All measure savings calculations are based on a peer-review source that can vary from ASHRAE, EnergyStar, Energy.gov, Technical Reference Manuals, etc. Measure analysis is determined through a number of inputs by user, and defaults sourced and documented within the measure itself. The calculation determines both, baseline and energy efficient cases, where the difference determines the savings. When applicable, part-load or seasonal efficiencies are utilized to represent more accurate savings. Measures may contain interactive effects. Operational hours are determined through building/location operating hours. Weather data is called when necessary in analyzing degree days based on the location of the surveyed building. Electric savings are represented in kWh, gas savings appear in therms and the total energy savings can be found in kBtu. Cost saving evaluation is based on the blended rate of the respective fuels and a cash flow analysis that is based on typical inflation. Emissions are based on the appropriate fuel and factors that apply to this location.



APPENDIX H - Professional Service Conditions

Our Services - Reserve Advisors, LLC ("RA" or "us" or "we") performs its services as an independent contractor in accordance with our professional practice standards and its compensation is not contingent upon our conclusions. The purpose of our energy audit services is to (i) provide an assessment of the subject property's energy needs, and efficiency and (ii) identify opportunities to minimize energy usage and reduce related operating costs at the subject property. Our energy audit services will be performed at one of the following two levels (as indicated in the Proposal): (i) ASHRAE I – Level I Energy Audit ("ASHRAE I"), which includes energy benchmarking services and presents (a) no cost, low cost and capital intensive measures, (b) cost savings ratings in the form of low, medium and high, and (c) applicable utility rebates; and (ii) ASHRAE II – Level II Energy Audit ("ASHRAE II"), which includes energy benchmarking services and presents (a) itemized data by energy system, (b) recommended implementation costs, (c) anticipated savings, and (d) applicable utility rebates. The energy benchmarking services included in an ASHRAE I and ASHRAE II consist of tracking, collecting and summarizing the subject property's energy consumption over time for your use in comparison with other buildings of similar size and establishing a performance baseline for your planning of long-term energy efficiency goals.

Our energy audit inspection and analysis of the subject property is limited to visual observations, is noninvasive and is not meant to nor does it include investigation into statutory, regulatory or code compliance. Inspection of any roof components will only be completed where safe access is available (stairs or ladder permanently attached to the structure). Our energy benchmarking services with respect to the subject property included in the energy audit services is limited to collecting energy and utility data and summarizing such data in the form of an Energy Star Portfolio Manager Report or any other similar report, and hereby expressly excludes the accuracy of the energy information obtained from utility companies and other third-party sources with respect to the subject property. The energy audit and benchmarking report(s) prepared and delivered in connection with the energy audit and benchmarking services (collectively, the "Report") is based upon a "snapshot in time" at the moment of inspection. The inspection and analysis are conducted by employees generally familiar with real estate and building construction and with knowledge of mechanical and energy use systems. For purposes of clarification, our energy audit and benchmarking services exclude any opinion on the structural integrity of or other physical defects in the subject property. Without limitation to the foregoing, RA cannot and shall not opine on, nor is RA responsible for, the subject property's conformity to specific governmental code requirements for fire, building, earthquake, occupancy or otherwise.

RA is not responsible for conditions that have changed between the time of inspection and the issuance of the Report. RA does not provide invasive testing on any mechanical systems that provide energy to the subject property, nor can RA opine on any system components that are not easily accessible during the inspection. RA does not investigate, nor assume any responsibility for, any existence or impact of any hazardous materials, such as asbestos, urea-formaldehyde foam insulation, other chemicals, toxic wastes, environmental mold or other potentially hazardous materials or structural defects that are latent or hidden defects which may or may not be present on or within the subject property. RA does not make any soil analysis or geological study as part of its services, nor does RA investigate vapor, water, oil, gas, coal, or other subsurface mineral and use rights or such hidden conditions, and RA assumes no responsibility for any such conditions. The Report may contain opinions of certain estimated costs (including with respect to the subject property's current energy consumption, proposed energy efficiency implementation costs, and/or anticipated cost savings/rebates), which opinions are neither a quarantee of actual costs or expenses, nor a guarantee of remaining useful lives of any property element. RA assumes, without independent verification, the accuracy of all data provided to it. Except to the extent resulting from RA's willful misconduct in connection with the performance of its obligations under this agreement, you agree to indemnify, defend, and hold RA and its affiliates, officers, managers, employees, agents, successors and assigns (each, an "RA Party") harmless from and against (and promptly reimburse each RA Party for) any and all losses, claims, actions, demands, judgments, orders, damages, expenses or liabilities, including, without limitation, reasonable attorneys' fees, asserted against or to which any RA Party may become subject in connection with this engagement, including, without limitation, as a result of any false, misleading or incomplete information which RA relied upon that was supplied by you or others under your direction, or which may result from any improper use or reliance on the Report by you or third parties under your control or direction or to whom you provided the Report. NOTWITHSTANDING ANY OTHER PROVISION HEREIN TO THE CONTRARY, THE AGGREGATE LIABILITY (IF ANY) OF RA WITH RESPECT TO THIS AGREEMENT AND RA'S OBLIGATIONS HEREUNDER IS LIMITED TO THE AMOUNT OF THE FEES ACTUALLY RECEIVED BY RA FROM YOU FOR THE SERVICES AND REPORT PERFORMED BY RA UNDER THIS AGREEMENT, WHETHER ARISING IN CONTRACT, TORT (INCLUDING NEGLIGENCE), STRICT LIABILITY OR OTHERWISE. YOUR REMEDIES SET FORTH HEREIN ARE EXCLUSIVE AND ARE YOUR SOLE REMEDIES FOR ANY FAILURE OF RA TO COMPLY WITH ITS OBLIGATIONS HEREUNDER OR OTHERWISE. RA SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, ANY LOST PROFITS AND LOST SAVINGS, LOSS OF USE OR INTERRUPTION OF BUSINESS, HOWEVER CAUSED, WHETHER ARISING IN CONTRACT, TORT (INCLUDING NEGLIGENCE), BREACH OF WARRANTY, STRICT LIABILITY OR OTHERWISE, EVEN IF RA HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL RA BE LIABLE FOR THE COST OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES. RA DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES WHATSOEVER, EXPRESS OR IMPLIED OR OF ANY NATURE, WITH REGARD TO THE SERVICES AND THE REPORT, INCLUDING, WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.



Report - RA will complete the services in accordance with the Proposal. The Report represents a valid opinion of RA's findings and recommendations with respect to the energy audit and benchmarking services and is deemed complete. All information received by RA and all files, work papers or documents developed by RA during the course of the engagement shall remain the property of RA and may be used for whatever purpose it sees fit. RA reserves the right to, and you acknowledge and agree that RA may, use any data provided by you in connection with the services, or gathered as a result of providing such services, including in connection with creating and issuing any Report, in a de-identified and aggregated form for RA's business purposes.

Your Obligations - You agree to provide us access to the subject property for an on-site visual inspection. You agree to provide RA all available historical replacement schedules, utility bills, historical energy usage files or any other information that RA requests and deems necessary to complete the services and the Report, and you agree to provide any utility release(s) reasonably requested by RA permitting RA to obtain any such data and/or information from any utility representative or other third party. You agree to pay actual attorneys' fees and any other costs incurred to collect on any unpaid balance for RA's services.

Use of Our Report - Use of the Report is limited to only the purpose stated herein. You acknowledge that RA is the exclusive owner of all intellectual property rights in and relating to the Report. You hereby acknowledge that any use or reliance by you on the Report for any unauthorized purpose is at your own risk and that you will be liable for the consequences of any unauthorized use or distribution of the Report. Use or possession of the Report by any unauthorized third party is prohibited. The Report in whole or in part is not and cannot be used as a design specification for design engineering purposes or as an appraisal. You may show the Report in its entirety to the following third parties: members of your organization (including your directors, officers, tenants and prospective purchasers), your accountants, attorneys, financial institutions and property managers who need to review the information contained herein, and any other third party who has a right to inspect the Report under applicable law, including, but not limited to, any governmental entity or agency, or any utility company. Without the written consent of RA, you shall not disclose the Report to any other third party. By engaging our services, you agree that the Report contains intellectual property developed (and owned solely) by RA and agree that you will not reproduce or distribute the Report to any party that conducts energy audit or benchmarking services or reserve studies without the written consent of RA.

RA will include (and you hereby agree that RA may include) your name in our client lists. RA reserves the right to use (and you hereby agree that RA may use) property information to obtain estimates of costs, useful life of property elements or otherwise as RA, in its sole discretion, deems appropriate.

Payment Terms, Due Dates and Interest Charges - The retainer payment is due upon execution of this agreement and prior to any inspection by RA in connection with the provision of any energy audit services. Any balance is due net 30 days from the Report shipment date. Any balance remaining 30 days after delivery of the Report shall accrue an interest charge of 1.5% per month. Unless this agreement is earlier terminated by RA in the event you breach or otherwise fail to comply with your obligations under this agreement, RA's obligations under this agreement shall commence on the date you execute and deliver this agreement and terminate on the date that is 6 months from the date of delivery of the Report by RA. Notwithstanding anything herein to the contrary, each provision that by its context and nature should survive the expiration or early termination of this agreement shall so survive, including, without limitation, any provisions with respect to payment, intellectual property rights, limitations of liability and governing law.

Miscellaneous – Neither party shall be liable for any failures or delays in performance due to fire, flood, strike or other labor difficulty, act of God, act of any governmental authority, riot, embargo, fuel or energy shortage, pandemic, wrecks or delays in transportation, or due to any other cause beyond such party's reasonable control; provided, however, that you shall not be relieved from your obligations to make any payment(s) to RA as and when due hereunder. In the event of a delay in performance due to any such cause, the time for completion or date of delivery will be extended by a period of time reasonably necessary to overcome the effect of such delay. You may not assign or otherwise transfer this agreement, in whole or in part, without the prior written consent of RA. RA may freely assign or otherwise transfer this agreement, in whole or in part, without your prior consent. This agreement shall be governed by the laws of the State of Wisconsin without regard to any principles of conflicts of law that would apply the laws of another jurisdiction. Any dispute with respect to this agreement shall be exclusively venued in Milwaukee County Circuit Court or in the United States District Court for the Eastern District of Wisconsin. Each party hereto agrees and hereby waives the right to a trial by jury in any action, proceeding or claim brought by or on behalf of the parties hereto with respect to any matter related to this agreement.