

## Performance Metrics for Commercial Buildings



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# **Performance Metrics for Commercial Buildings**

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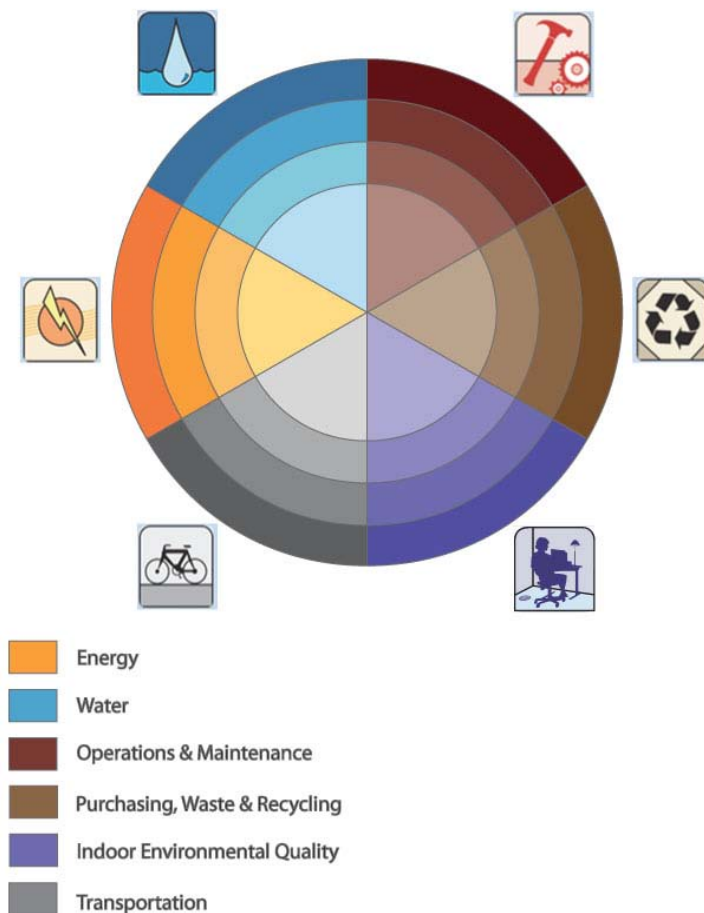
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## Overview

Commercial building owners and operators have requested a standard set of key performance metrics to provide a systematic way to evaluate the performance of their buildings. The performance metrics included in this document provide standard metrics for the energy, water, operations and maintenance, indoor environmental quality, purchasing, waste and recycling and transportation impact of their building. The metrics can be used for comparative performance analysis between existing buildings and industry standards to clarify the impact of sustainably designed and operated buildings. The building features can be used to normalize the building performance metrics for comparative analysis. A companion document titled *Assessing Sustainability: Protocol to Measuring Building Performance* provides the details on how to apply the metrics to a specific commercial building.





ENERGY

Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency		
Total Building Energy Use				kBtu/ft <sup>2</sup> , total & itemized by fuel type	Utility Bill	M		
Total Building Energy Cost				cost/ft <sup>2</sup> , total & itemized by fuel type	Utility Bill	M		
	Indoor Energy Use			kBtu/ft <sup>2</sup> , total & itemized by fuel type	Meter, Utility Bill	M		
	Indoor Energy Cost			cost/ft <sup>2</sup> , total & itemized by fuel type	Utility Bill, Calculation	M		
		Lighting Energy Use		kWh/ft <sup>2</sup>	Meter	M		
			Installed Lighting Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Plug-in Lighting Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Façade Lighting Energy Use	kWh/ft <sup>2</sup> of façade area	Meter	M		
		HVAC Energy Use		Btu/ft <sup>2</sup> , Btu/occupant, total & itemized by fuel type	Meter	M		
			Pump Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Fan Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Exhaust Fan Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Chiller Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Boiler Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Reheat Coil Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Packaged HVAC Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Heat Rejection Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Purchased Chilled Water Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Purchased Steam Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Air Compressor Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Freeze Protection Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
		DHW Energy Use		Btu/occupant, Btu/gal	Meter	M		
		People-mover Energy Use		kWh/mover	Meter	M		
			Elevator Energy Use	kWh/mover	Meter	M		
			Escalator/Moving Sidewalk Energy Use	kWh/mover	Meter	M		
		Refrigeration Energy Use		kWh/ft <sup>2</sup>	Meter	M		
			Refirgeration Compressor Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Refirgeration Condenser Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Refirgeration Evaporator/Case Fan Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Refirgeration Case Lighting Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Refirgeration Defrost Energy Use	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
			Refirgeration Anti Sweat/Door Heater Energy Us	kWh/ft <sup>2</sup> , kWh/occupant	Meter	M		
		Cooking Energy Use		kWh/ft <sup>2</sup>	Meter	M		
		Dishwasher Energy Use		kWh/ft <sup>2</sup>	Meter	M		
		Plug Load Energy Use		kWh/ft <sup>2</sup> , kW/ft <sup>2</sup>	Meter	M		
		Data Center Energy Use		kWh/ft <sup>2</sup> , kW/ft <sup>2</sup>	Meter	M		
		Other Building Energy Use		kWh/ft <sup>2</sup> , kW/ft <sup>2</sup>	Meter	M		
			Swimming Pool (hot water) Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Swimming Pool (pump) Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Water Feature Pump Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Water Treatment Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
			Laundry Energy Use	Btu/ft <sup>2</sup> , Btu/occupant	Meter	M		
		Industrial Process Energy Use		Btu/unit production	Meter	M		
		Cogeneration Fuel Use		Btu/ft <sup>2</sup>	Meter	M		
		Cogeneration Electrical Output		kWh/ft <sup>2</sup>	Meter	M		
		Cogeneration Thermal Output		Btu/ft <sup>2</sup>	Meter	M		
		Cogeneration Losses		% loss/total energy	Calculation	M		
	Outdoor Energy Use			kBtu/ft <sup>2</sup> , total & itemized by fuel type	Meter, Utility Bill	M		
	Outdoor Energy Cost			cost/site area	Calculation, Utility Bill	M		
		Parking Lot Lighting Energy Use		kWh/site area, kW/site area	Meter	M		
		Walkway Lighting Energy Use		kWh/site area, kW/site area	Meter	M		
		Sign Lighting Energy Use		kWh/site area, kW/site area	Meter	M		
		Landscape Lighting Energy Use		kWh/site area, kW/site area	Meter	M		
		Outdoor Swimming Pool Energy Use		kWh/site area	Meter	M		
	Landscape Energy Use		Btu/site area	Operation and Maintenance Record	M			
	Landscape Energy Cost		cost/site area	Operation and Maintenance Record	M			
		Motorized Equipment Energy Use		fuel gal/site area	Operation and Maintenance Record	M		
		Electric Equipment Energy Use		kWh/site area	Operation and Maintenance Record	M		

ENERGY						
Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency
		Landscaping Greenhouse Gas Emissions		Metric Ton CO <sub>2</sub> e/site area	Calculation	M
	Emergency Energy Use			kBtu/time, total & itemized by fuel type	Utility Bill, Calculation	A
	Emergency Energy Cost			cost/time	Utility Bill, Calculation	A
Building Peak Demand				kW, kW/ft <sup>2</sup>	Utility Bill	M
Building Peak Demand Cost				cost, % peak demand/total bill	Utility Bill	M
	Building Load Factor			unitless	Calculation	M
Owner-generated Energy Production				Btu/time, % generated/total energy use	Meter, Utility Bill	M
	Thermal Energy Production			Btu/time, % generated/total energy use	Meter	M
	PV Energy Production			Btu/time, % generated/total energy use	Meter	M
	Wind Energy Production			Btu/time, % generated/total energy use	Meter	M
		Energy Storage Losses		Btu/time, % generated/total energy use	Meter	M
		Electrical Generation System Losses		Btu/time, % generated/total energy use	Meter	M
		Energy Export		Btu/time, % generated/total energy use	Meter	M
Net Building Energy Use				kBtu/ft <sup>2</sup> , total & itemized by fuel type	Utility Bill, Calculation	M
Net Building Energy Cost				cost/ft <sup>2</sup> , total & itemized by fuel type	Utility Bill, Calculation	M
	Total Building Source Energy Use			Btu/site area	Calculation	M
	Building Energy Greenhouse Gas Emissions			Metric Ton CO <sub>2</sub> e/site area	Utility Bill	A
	Purchased Offsets			Metric Ton CO <sub>2</sub> e/site area, cost/site area	Utility Bill	A
		Green Power/Renewable Energy Credits		kWh/site area	Utility Bill	A
		Green Power Costs		cost/kWh	Utility Bill	A
		Greenhouse Gas Emissions Credits		Metric Ton CO <sub>2</sub> e/site area	Operation and Maintenance Record	A
		Greenhouse Gas Emissions Credits Costs		cost/Metric Ton CO <sub>2</sub> e	Operation and Maintenance Record	A

Reporting Frequency:

M= Monthly

A= Annually

S= Spot Measurement



WATER						
Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency
Total Building Water Use				gal/ft <sup>2</sup>	Utility Bill	M
Total Building Water Cost				cost/ft <sup>2</sup>	Utility Bill	M
	Indoor Potable Water Use			gal/ft <sup>2</sup> , gal/occupant	Meter, Utility Bill	M
	Indoor Potable Water Cost			cost/ft <sup>2</sup> , cost/occupant	Utility Bill, Calculation	M
		Restroom Potable Water Use		gal/ft <sup>2</sup> , gal/occupant	Meter	M
			Sink Water Use	gal/ft <sup>2</sup> , gal/occupant	Meter	M
			Potable Toilet Water Use	gal/ft <sup>2</sup> , gal/occupant	Meter	M
			Potable Urinal Water Use	gal/ft <sup>2</sup> , gal/occupant	Meter	M
		Kitchen Water Use		gal/ft <sup>2</sup> , gal/meal	Meter	M
			Rinse Sink Water Use	gal/ft <sup>2</sup> , gal/meal	Meter	M
			Food-prep Sink Water Use	gal/ft <sup>2</sup> , gal/meal	Meter	M
			Dishwasher Water Use	gal/ft <sup>2</sup> , gal/meal	Meter	M
			Ice Maker Water Use Water Use	gal/100 lb ice	Meter	M
		Shower Facility Water Use		gal/ft <sup>2</sup> , gal/occupant	Meter	M
		Drinking Fountain Water Use		gal/ft <sup>2</sup> , gal/occupant	Meter	M
		Janitorial Water Use		gal/ft <sup>2</sup> , gal/occupant	Meter	M
		Laundry Water Use		gal/ft <sup>2</sup> , gal/occupant, gal/100 lb laundry	Meter	M
		Indoor Washdown Water Use (if indoor)		gal/time	Meter	M
			Indoor Vehicle Washdown Water Use	gal/time	Meter	M
			Indoor Equipment Washdown Water Use	gal/time	Meter	M
	Indoor Non-potable Water Use			gal/ft <sup>2</sup> , gal/occupant	Meter	M
	Indoor Non-potable Water Cost			cost/ft <sup>2</sup> , cost/occupant	Calculation	M
		Restroom Non-potable Water Use		gal/ft <sup>2</sup> , gal/occupant	Meter	M
			Non-Potable Toilet Water Use	gal/ft <sup>2</sup> , gal/occupant	Meter	M
			Non-Potable Urinal Water Use	gal/ft <sup>2</sup> , gal/occupant	Meter	M
	Outdoor Potable Water Use			gal/irrigated site area	Meter, Utility Bill	M
	Outdoor Potable Water Cost			cost/irrigated site area	Utility Bill, Calculation	M
		Outdoor Potable Landscape Water Use		gal/irrigated site area	Meter	M
		Outdoor Potable Non-Landscape Water Use		gal/irrigated site area	Meter	M
			Outdoor Potable Water Features Water Use	gal/time	Meter	M
			Outdoor Potable Swimming Pools Water Use	gal/time	Meter	M
		Outdoor Washdown Water Use (if outdoor)		gal/time	Meter	M
			Outdoor Vehicle Washdown Water Use	gal/time	Meter	M
			Outdoor Equipment Washdown Water Use	gal/time	Meter	M
	Outdoor Non-Potable Water Use			gal/ft <sup>2</sup> , gal/occupant	Meter, Utility Bill	M
	Outdoor Non-Potable Water Cost			cost/ft <sup>2</sup> , cost/occupant	Utility Bill, Calculation	M
		Outdoor Non-Potable Landscape Water Use		gal/irrigated site area	Meter	M
		Outdoor Non-Potable Non-Landscape Water Use		gal/irrigated site area	Meter	M
			Outdoor Non-Potable Water Features Water Use	gal/time	Meter	M
	Process Water Use			gal/ft <sup>2</sup> , gal/occupant	Meter, Utility Bill	M
	Process Water Cost			cost/ft <sup>2</sup>	Utility Bill, Calculation	M
		Hydronic Loop Make-up Water Use		gal/ft <sup>2</sup>	Meter	M
			Chilled Water Cooling System Make-up Water Use	gal/ft <sup>2</sup>	Meter	M
			Heating Hot Water System Make-up Water Use	gal/ft <sup>2</sup>	Meter	M
		Evaporative Cooling System Water Use		gal/ft <sup>2</sup>	Meter	M
			Cooling Tower Make-up Water Use	gal/ft <sup>2</sup>	Meter	M
			Evaporative Space Cooling System Make-up Water Use	gal/ft <sup>2</sup>	Meter	M
		Pre-Treatment Process Water Use		gal/ft <sup>2</sup>	Meter	M
	Non-Potable Water Collection			gal/time	Meter	M
	On-site Collected Non-potable Water Treatment Cost			cost/time	Operation and Maintenance Record	M
		Captured Rain Water		gal/time	Meter	M
		Recycled Greywater		gal/time	Meter	M
		Condensate Recovery		gal/time	Meter	M
Total Building Wastewater Production				gal/ft <sup>2</sup>	Utility Bill	M
Total Building Wastewater Cost				cost/ft <sup>2</sup>	Utility Bill	M
	Indoor Wastewater Production			gal/ft <sup>2</sup>	Meter, Utility Bill	M
	Indoor Wastewater Cost			cost/ft <sup>2</sup>	Utility Bill, Calculation	M
	Outdoor Wastewater Production			gal/ft <sup>2</sup>	Meter, Utility Bill	M
	Outdoor Wastewater Cost			cost/ft <sup>2</sup>	Utility Bill, Calculation	M
		Stormwater Sewer Production		gal/irrigated site area	Meter	M
		Stormwater Sewer Cost		cost/irrigated site area	Utility Bill, Calculation	M
		Stormwater Discharge		gal/irrigated site area	Meter	M
			Roof Stormwater Run-off Retention Time	in./time	Calculation	M

OPERATIONS AND MAINTENANCE						
Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency
Operating Cost				cost/ft <sup>2</sup>	Operation and Maintenance Record	A
	Building Liability Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record	A
		Lawsuits		type of lawsuit; # of lawsuits; cost/year	Operation and Maintenance Record	A
		Insurance Cost		cost/ft <sup>2</sup>	Operation and Maintenance Record	A
	Equipment Operation Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record	A
		Equipment Repair Cost		cost/ft <sup>2</sup> ; hours/service; jobs/year	Operation and Maintenance Record	A
		Operation Training Cost		cost/ft <sup>2</sup>	Operation and Maintenance Record	A
		Recommissioning Cost		cost/ft <sup>2</sup>	Operation and Maintenance Record	A
	Environmental Record Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record	A
	Safety Record Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record	A
	Churn Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record	M
		Box Moves Cost		cost/move; hours/move; ratio of box moves/total move	Operation and Maintenance Record	M
		Furniture Moves Cost		cost/move; hours/move; ratio of furniture moves/total move	Operation and Maintenance Record	M
		Construction Moves Cost		cost/move; hours/move; ratio of construction moves/total move	Operation and Maintenance Record	M
		IT Moves Cost (setting up phone, cable, etc.)		cost/move; hours/move; ratio of IT moves/total move	Operation and Maintenance Record	M
Maintenance Cost				cost/ft <sup>2</sup>	Operation and Maintenance Record	A
	Building Maintenance			cost/ft <sup>2</sup> ; preventative maintenance/service call ratio	Operation and Maintenance Record	A
		Preventative Maintenance (PM)		cost/ft <sup>2</sup> ; # of PM items; hours for PM; jobs/year	Operation and Maintenance Record	A
		Work Orders or Service Calls		cost/ft <sup>2</sup> ; # of Work Order items; hours for Work Order	Operation and Maintenance Record	M
			Type of Work Order	% by type	Operation and Maintenance Record	M
			Work Order Hazardous Materials Use	volume/ft <sup>2</sup>	Operation and Maintenance Record	M
			Work Order Materials Inventory	cost/ft <sup>2</sup>	Operation and Maintenance Record	M
		Diagnostic Maintenance Cost		cost/ft <sup>2</sup> ; # of maintenance items; hours for maintenance	Operation and Maintenance Record	A
			HVAC System Diagnostic Maintenance Cost	cost/time; hours/time	Operation and Maintenance Record	A
			Envelope Diagnostic Maintenance Cost	cost/time; hours/time	Operation and Maintenance Record	A
			Refrigeration Diagnostic Maintenance Cost	cost/time; hours/time	Operation and Maintenance Record	A
			Lighting Control System Diagnostic Maintenance Cost	cost/time; hours/time	Operation and Maintenance Record	A
			Other Highlighted Design Features or Materials Diagnostic Cost	cost/time; hours/time	Operation and Maintenance Record	A
		Special Projects Maintenance		cost/ft <sup>2</sup> ; hours/service; jobs/year	Operation and Maintenance Record	A
			Material Choices for Special Projects	cost/ft <sup>2</sup>	Operation and Maintenance Record	A
		Emergency Maintenance Cost		cost/time	Operation and Maintenance Record	A
	Janitorial Services Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record	A
		Regular Cleaning		cost/ft <sup>2</sup> ; hours/service; jobs/year	Operation and Maintenance Record	A
			Special Cleaning	cost/ft <sup>2</sup> ; hours/service; jobs/year	Operation and Maintenance Record	A
		Janitorial Services	Hazardous Materials Use	volume/ft <sup>2</sup>	Operation and Maintenance Record	A
			Janitorial Services Materials Inventory	cost/ft <sup>2</sup>	Operation and Maintenance Record	A
		Window Cleaning		cost/ft <sup>2</sup> ; hours/service; jobs/year	Operation and Maintenance Record	A
	Grounds Maintenance Cost			cost/site area	Operation and Maintenance Record	M
		Landscape Maintenance Cost		cost/ft <sup>2</sup> ; hours/service; jobs/year	Operation and Maintenance Record	M
			landscape Hazardous Materials Use	volume/site area	Operation and Maintenance Record	M
			Landscape Maintenance Materials Inventory	cost/site area	Operation and Maintenance Record	M
		Parking Lot Maintenance Cost		cost/site area; hours/service; jobs/year	Operation and Maintenance Record	M
			Parking Lot Hazardous Materials Use	volume/site area	Operation and Maintenance Record	M
			Parking Lot Maintenance Materials Inventory	cost/site area	Operation and Maintenance Record	M



INDOOR ENVIRONMENTAL QUALITY							
Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Reporting Units (SI)	Typical Data Source	Reporting Frequency
Overall Occupant Satisfaction	Occupant Satisfaction - Thermal Comfort	Satisfaction by Floor		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
		Satisfaction by Space Indoor Temperature by Floor		% satisfaction	% satisfaction	Survey	A
				°F or °C	°F or °C	Measurement	M
			Indoor Temperature by Space	°F or °C	°F or °C	Measurement	M
			Outdoor Temperature	°F or °C	°F or °C	Measurement	M
			Indoor Relative Humidity by Space	%	%	Measurement	M
	Occupant Satisfaction - Lighting	Satisfaction by Floor	Ventilation Rate	ACH, cfm	ACH, m³/s	Measurement	M
			Time within Thermal Comfort Range	time within/total occupied time	time within/total occupied time	Measurement	A
				% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
		Satisfaction by Space Illuminance Levels by Space Luminous Ratios by Space	Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
				foot-candle	lux	Survey	S
				ratio of object to background	ratio of object to background	Survey	S
				% satisfaction	% satisfaction	Survey	A
	Occupant Satisfaction - Air Quality	Satisfaction by Floor		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
		Satisfaction by Space Carbon Dioxide Level by Floor		% satisfaction	% satisfaction	Survey	A
				ppm	ppm	Measurement	A
			CO₂ Level by Space	ppm	ppm	Measurement	S
			Carbon Monoxide Level by Floor	ppm	ppm	Measurement	S
			CO Level by Space	ppm	ppm	Measurement	S
	Occupant Satisfaction - Acoustics	Satisfaction by Floor	Volatile Organic Compound Level by Floor	ppm	ppm	Measurement	S
			VOC Level by Space	ppm	ppm	Measurement	S
				% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
		Satisfaction by Space Sound Levels by Floor	Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
				dB	dB	Measurement	S
			Sound Levels by Space	dB	dB	Measurement	S
	Occupant Satisfaction - Maintenance	Satisfaction by Floor		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
	Occupant Satisfaction - Cleanliness	Satisfaction by Space		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Floor	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
	Occupant Satisfaction - Functionality	Satisfaction by Space		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Floor	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
	Occupant Satisfaction - Safety and Security	Satisfaction by Space		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Satisfaction by Floor	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Gender	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Age	% satisfaction	% satisfaction	Survey	A
	Occupant Satisfaction - Privacy	Satisfaction by Space		% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
			Visual Privacy	% satisfaction	% satisfaction	Survey	A
			Conversational Privacy	% satisfaction	% satisfaction	Survey	A
			Satisfaction by Floor	% satisfaction	% satisfaction	Survey	A
Turnover Rate			Satisfaction by Space	% satisfaction	% satisfaction	Survey	A
				% satisfaction	% satisfaction	Survey	A
				% turnover	% turnover	Personnel Record	A
				% turnover	% turnover	Personnel Record	A
Absenteeism			Turnover Rate by Gender	% turnover	% turnover	Personnel Record	A
			Turnover Rate by Age	% turnover	% turnover	Personnel Record	A
			Turnover rate by Space	% turnover	% turnover	Personnel Record	A
				days	days	Personnel Record	A
			Absenteeism by Gender	days	days	Personnel Record	A
			Absenteeism by Age	days	days	Personnel Record	A
			Absenteeism by Space	days	days	Personnel Record	A



PURCHASING, WASTE, AND RECYCLING

Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency
Waste and Recycling				ton/ft <sup>2</sup> , ton/occupant, CO <sub>2</sub> e/ft <sup>2</sup> , ratio of recycled materials to sanitary waste	Utility Bill, Calculation	M
Waste and Recycling Cost				cost/ft <sup>2</sup> , cost/occupant	Utility Bill	M
	Solid Sanitary Waste			ton/ft <sup>2</sup> , ton/occupant, CO <sub>2</sub> e/ft <sup>2</sup>	Utility Bill, Calculation	M
	Solid Sanitary Waste Cost			cost/ft <sup>2</sup> , cost/occupant	Utility Bill	M
	Recycled Materials			ton/ft <sup>2</sup> , ton/occupant, CO <sub>2</sub> e/ft <sup>2</sup>	Calculation, Operation and Maintenance Record	M
	Recycled Materials Cost			cost/ft <sup>2</sup> , cost/occupant	Calculation, Operation and Maintenance Record	M
		Recycled Metals		ton/ft <sup>2</sup> , ton/occupant,, ratio of recycled metals to total recycled materials	Operation and Maintenance Record	M
		Recycled Metals Cost		cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
		Recycled Paper		ton/ft <sup>2</sup> , ton/occupant, ratio of recycled paper to total recycled materials	Operation and Maintenance Record	M
		Recycled Paper Cost		cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
		Recycled Cardboard		ton/ft <sup>2</sup> , ton/occupant, ratio of recycled cardboard to total recycled materials	Operation and Maintenance Record	M
		Recycled Cardboard Cost		cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
		Recycled Office Products		ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
		Recycled Office Products Cost		cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Toner Cartridges	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Toner Cartridges Cost	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Phones	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Phones Cost	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Charging Equipment and Batteries	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Charging Equipment and Batteries Cost	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Displays	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Displays Cost	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Computers	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Computers Cost	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Printing/Fax Machines	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Printing/Fax Machines Cost	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
			Recycled Image Projection (TV, projector)	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			Recycled Image Projection Cost(TV, projector)	cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
		Recycled Others (Glass, Plastic, Batteries, etc)		ton/ft <sup>2</sup> , ton/occupant, ratio of recycled others to total recycled materials	Operation and Maintenance Record	M
		Recycled Others Cost (Glass, Plastic, Batteries, etc)		cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
	Reused/Refurbished Materials			ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
	Reused/Refurbished Materials Cost			cost/ft <sup>2</sup> , cost/occupant	Operation and Maintenance Record, Calculation	M
	Compost Food Waste			ton/occupant	Operation and Maintenance Record	M
	Compost Food Waste Cost			cost/occupant	Operation and Maintenance Record, Calculation	M
	Landscape Debris			ton/ft <sup>2</sup> site area	Operation and Maintenance Record	A
	Landscape Debris Cost			cost/ft <sup>2</sup> site area	Operation and Maintenance Record, Calculation	A
		Composted Landscape Debris		ton/ft <sup>2</sup> site area	Operation and Maintenance Record	A
		Composted Landscape Debris Cost		cost/ft <sup>2</sup> site area	Operation and Maintenance Record, Calculation	A
		Disposed Landscape Debris		ton/ft <sup>2</sup> site area	Operation and Maintenance Record	A
		Disposed Landscape Debris Cost		cost/ft <sup>2</sup> site area	Operation and Maintenance Record, Calculation	A
	Building Modification Waste			ton/ft <sup>2</sup>	Operation and Maintenance Record	A
	Building Modification Waste Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	A
		Recycled Building Modification Waste		ton/ft <sup>2</sup>	Operation and Maintenance Record	A
		Recycled Building Modification Waste Cost		cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	A
			Recycled Building Modification Concrete	ton/ft <sup>2</sup>	Operation and Maintenance Record	A
			Recycled Building Modification Concrete Cost	cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	A
			Disposed Building Modification Waste	ton/ft <sup>2</sup>	Operation and Maintenance Record	A
			Disposed Building Modification Waste Cost	cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	A
	Hazardous Waste			ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
	Hazardous Waste Cost			cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	M
			F List (Non-source Specific Waste)	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			F List (Non-source Specific Waste) Costs	cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	M
			K List (Source Specific Waste)	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			K List (Source Specific Waste) Costs	cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	M
			P & U List (Commercial Chemical Products)	ton/ft <sup>2</sup> , ton/occupant	Operation and Maintenance Record	M
			P & U List (Commercial Chemical Products) Costs	cost/ft <sup>2</sup>	Operation and Maintenance Record, Calculation	M
Total Purchases Cost				cost of purchases	Purchasing Record	A
Environmentally Preferable Purchases				% cost of EPP/total cost of purchases	Purchasing Record	A
	Office Materials Purchases			% cost of EPP/total cost of purchases	Purchasing Record	A
		Paper Purchases		% cost of EPP/total cost of purchases	Purchasing Record	A
		Plastic Office Products Purchases		% cost of EPP/total cost of purchases	Purchasing Record	A

PURCHASING, WASTE, AND RECYCLING						
Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency
		Electronic Equipment Purchases		% cost of EPP/total cost of purchases	Purchasing Record	A
			Toner Cartridges Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
			Phones Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
			Charging Equipment and Batteries Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
			Displays Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
			Computers Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
			Printing/Fax Machines Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
			Image Projection (TV, projector) Purchases	% cost of EPP/total cost of purchases	Purchasing Record	A
		Office Furniture Purchases		% cost of EPP/total cost of purchases	Purchasing Record	A
	Facilities Operation and Maintenance Purchases			% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		Cleaning Products Purchases		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Tissue Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Plastic Bags Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		Construction and Renovation Materials Purchases		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Concrete Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		Appliances Purchases		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		General Maintenance Products Purchases		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			General Maintenance Lube, Oil, Hydraulic, Grease Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Adhesives and Coatings Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Aerosols Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			De-Icer Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
	Transportation Purchases			% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		Fleet Vehicle Ratio		% alternative fuel vehicles/regular fuel vehicles, % cost of alternative vehicle/total cost of vehicles	Purchasing Record, Operation and Maintenance Record	A
		Fleet Vehicles Alternative Fuel		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		Fleet Vehicle Maintenance Products Purchases		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Fleet Vehicle Maintenance Lube, Oil, Hydraulic, Grease Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
	Landscape Materials Purchases			% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
	Food Services Purchases			% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
		Food Service Appliances Purchases		% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A
			Disposable Containers, Cutlery, etc Purchases	% cost of EPP/total cost of purchases	Purchasing Record, Operation and Maintenance Record	A



TRANSPORTATION						
Level 1	Level 2	Level 3	Level 4	Reporting Units (IP)	Typical Data Source	Reporting Frequency
Occupant Commute Distance				Miles (round trip)/occupant per day	Survey	A
	Transportation Frequency			days/week of commute	Survey	A
	Mode of Transportation Ratio			% occupants driving (including vehicle type), using mass transit, carpooling, walking/biking	Survey	A
	Occupant Commute Greenhouse Gas Emissions			Metric Ton/occupant	Calculation	A
Occupant Commute Time				hr/day/occupant	Survey	A
Occupant Commute Service Cost				cost/occupant	Operation and Maintenance Record	A
	Cost of Alternative Transportation			cost/occupant	Operation and Maintenance Record	A
	Cost of Parking			cost/occupant	Operation and Maintenance Record	A
		Parking Land Cost		cost/occupant	Building Construction Cost Record	A
		Parking Construction Cost		cost/occupant	Building Construction Cost Record	A
		Parking Maintenance Cost		cost/occupant	Operation and Maintenance Record	A
		Parking Lighting Cost		cost/occupant	Operation and Maintenance Record	A
		Parking Security Cost		cost/occupant	Operation and Maintenance Record	A
Fleet Vehicle Fuel Use				gal/each fuel type	Operation and Maintenance Record	M
Fleet Vehicle Fuel Cost				cost/occupant	Operation and Maintenance Record	M
	Fleet Vehicle Type			% of each vehicle type	Operation and Maintenance Record	M
		Fleet Vehicle Type (Occupant)		% of each vehicle type	Operation and Maintenance Record	M
		Fleet Vehicle Type (Building)		% of each vehicle type	Operation and Maintenance Record	M
	Fleet Vehicle Distance			miles/time	Operation and Maintenance Record	M
		Fleet Vehicle Distance (Occupant)		miles/time	Operation and Maintenance Record	M
		Fleet Vehicle Distance (Building)		miles/time	Operation and Maintenance Record	M
	Fleet Vehicle Greenhouse Gas Emissions			Metric Ton/occupant	Calculation	M
		Fleet Vehicle Emissions (Occupant)		Metric Ton/occupant	Calculation	M
		Fleet Vehicle Emissions (Building)		Metric Ton/ft <sup>2</sup> site area	Calculation	M
Landscape Vehicle Fuel Use				gal/each fuel type	Operation and Maintenance Record	M
Landscape Vehicle Fuel Cost				cost/ft <sup>2</sup> site area	Operation and Maintenance Record	M
	Landscape Vehicle Greenhouse Gas Emissions			Metric Ton/ft <sup>2</sup> site area	Calculation	M
Business Air Travel Distance				miles/occupant	Travel Record	M
	Business Air Travel Type			short, medium, long haul	Travel Record	M
	Business Air Travel Greenhouse Gas Emissions			Metric Ton/occupant	Calculation	M
Business Rental Vehicle Distance				miles/occupant	Travel Record	M
	Business Rental Vehicle Type			% of each vehicle type	Travel Record	M
	Business Rental Vehicle Greenhouse Gas Emissions			Metric Ton/occupant	Calculation	M



BUILDING FEATURES

Level 1	Level 2	Level 3	Level 4	Context Comparability
General				
Building Location	Functional Area by Space	Climate Zone	Occupant Gender Ratio	Ratings or Awards
Building Type and Function	Conditioned Floor Area	Heating Degree Days	Total Façade Area	Building Floor plans
Year of Building First Occupied	Semi-Conditioned Floor Area	Cooling Degree Days	Total Roof Area	Key Building Features/Design Intent
Year of Last Major Renovation	Unconditioned Floor Area		Vegetated Roof Area	Type of Occupant
Total Number of Regular Occupants	Lighted Floor Area		Stormwater Flow Rate	Specialized Equipment Type and Efficiency (e.g. Refrigerator)
Number of Regular Visitors			Age Group of Occupants	Number of Floors
Gross Floor Area				Number of Underground Floors
Rentable Area				Gross Ground Floor Footprint
				Roof Type
				Fenestration-to-Wall Ratio
				Skylight-to-Floor Area Ratio
				Insulation Type and Thickness
				Opaque Wall Area
				Window Area
				Skylight Area
Utilities				
Electric Utility		Insurance Provider		Water Utility
Electricity Rate Structure				Water Rate Structure
Gas Utility				Waste and Recycling Management Company
Gas Rate Structure				Other Utilities
				Cogeneration System Type and Fuel Source
				Cogeneration System Peak Capacity (Electrical and Thermal)
				Renewable Energy System Type and Capacity
				Irrigation Water Source
				Stormwater System Features
Operation				
Operating Schedules (Building)			Operating Schedules (Lighting)	Operational Concerns
			Operating Schedules (HVAC)	Key Policies (PTO, Recycling, Transportation)
			Operation Schedule (Data Center)	Type of Maintenance Practices (Preventative, Predictive, Reactive, etc)
			Hours of Operation (Water Feature)	Number of Maintenance Staff
			Hours of Operation (Swimming Pool)	Maintenance Schedule
				Cleaning Schedule
				Number and Type of Fleet Vehicles
				Number and Type of Landscape Vehicles
Systems				
	Lighting Systems		Lamp/Fixture Type and Count by Space	Whole Building Installed Lighting Power Density
			Lamp/Fixture Wattage	Installed Lighting Power Density by Space
				Daylighting Controls (Yes/No)
				Occupancy Sensors (Yes/No)
	HVAC and Hot Water Systems		Cooling Equipment Capacity and Efficiency	HVAC System Types (List all systems by space)
			Heating Equipment Capacity and Efficiency	Cooling System (List all systems by space)
			Air Handling Unit Capacity	Heating System (List all systems by space)
			Pump Sizes	Air Distribution (List all systems by space)
			Cooling Tower Size	HVAC Control System (Local or Building Automation System)
			Economizers	Ventilation Rate
			Thermostat Set Points by Space	Piping Insulation
			Humidity Control Set Points by Space	Domestic Hot Water Tank Year, Efficiency, and Capacity
			Minimum Ventilation Rates	
	Data Center and Plug Loads		Data Center PUE	Average Plug Load Density
			Data Center Cooling Energy Source	
	Water Systems		Number of Plumbing Fixtures	Major Water Features
			Bathroom Fixture Efficiency and Frequency of Use	
			Kitchen Fixture Efficiency and Frequency of Use	
			Kitchen Appliance Efficiency and Frequency of Use	
			Washdown Fixture Efficiency and Frequency of Use	
			Swimming Pool Volume	
			Water Feature Volume	
Site Features				
Total Building Site Area	Irrigated Site Area	Lighted Parking Lot Area		Hard Site Surface Area
	Stormwater Best Management Practices			Permeable Site Surface Area
				Number of Outdoor Parking Spaces
				Number of Parking Garage Spaces

Notes:

Normalization factors for multiple categories

Building features not used for normalization

Normalization factors for Energy

Normalization factors for Water

Normalization factors for IEQ

Normalization factors for O & M