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THE STANDARD FOR LIGHTING MANAGEMENT QUALITY SINCE 1953

# SPRING SEMINAR

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# HOW TO PRESENT ENVIRONMENTAL IMPACT TO YOUR CUSTOMERS



**Energy Performance Improvement Project**

**Energy and Carbon Reduction Report** | **Tractor Tavern** | Report Date: 02/06/2024

Primary Function: **Tractor Tavern**  
Gross Floor Area (sq. ft.): **50,000**  
Built:

**Property Contact Information**

**Property Address:** 1215 Woodinvale Road, Maple Valley, WA 99735  
**Property Owner:** Bear Creek Records, 1215 Woodinvale Road, Maple Valley, WA 99735  
**Primary Contact:** Bear Creek Records

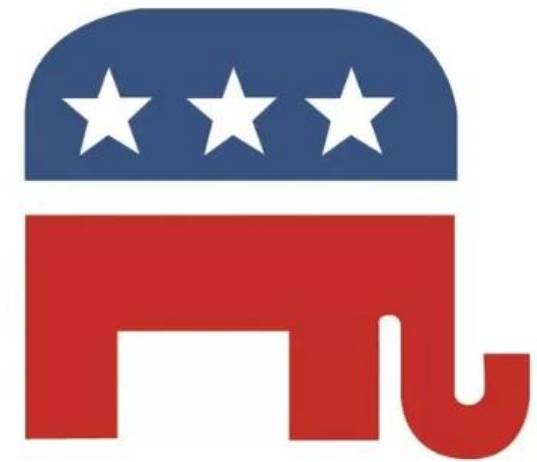
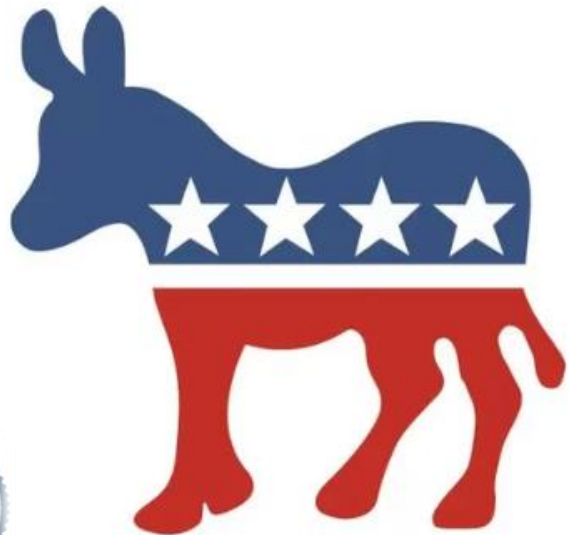
Property Metrics	Pre-Project	Post-Project	Reduction
Energy Reduction	2,147,600 kWh	1,310,400 kWh	837,200 kWh
Reduction in Energy Use Intensity		0.057 kBtu/ft <sup>2</sup>	
<i>(Adjusted for grid region efficiency factor excluding grid gross loss - RFC West)</i>			
Carbon Dioxide	2,246,604 lbs	1,370,809 lbs	875,795 lbs
Nitrous Oxide	0.030 lbs	0.018 lbs	0.012 lbs
Methane	0.204 lbs	0.124 lbs	0.080 lbs
Sulfur Dioxide	1,460 lbs	0.891 lbs	0.569 lbs

March 15, 2024

# Why Care About Sustainability?



The Standard for Lighting Management Quality since 1953 [www.nalmco.org](http://www.nalmco.org)



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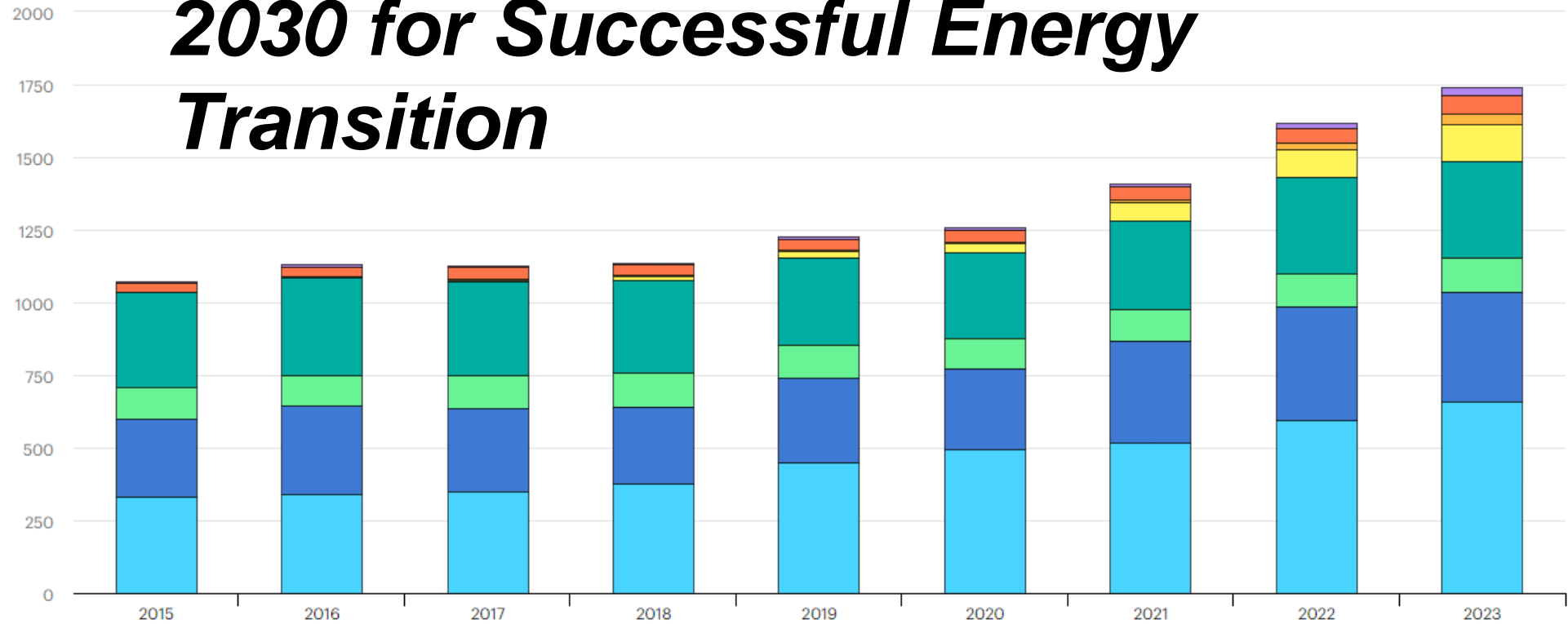
# Sustainability & Environmental Trends



# Climate Economics

## *Investment Needs of \$35 trillion by 2030 for Successful Energy Transition*

billion USD (2022)



IEA. Licence: CC BY 4.0

● Renewable power ● Energy efficiency ● Other end use ● Grids ● Electric vehicle ● Battery storage ● Nuclear ● Low-emission fuels and carbon capture utilisation and storage



# Why Climate is Important to Your Customers



**Cost Savings**



**Brand Reputation**



**Market Access & Opportunity**



**Attracting & Retaining Talent**



**Ethical & Social Responsibility**



**Regulatory Compliance**



**Risk Mitigation**



# Why is Climate Important to You the Service Provider?

- ✓ Important to your customers
- ✓ .. and your customer's customer
- ✓ Leadership and differentiation
- ✓ They will get their information from somewhere (why not you?)
- ✓ Opportunity to earn the role of trusted advisor
- ✓ Help them de-risk their business
- ✓ Positive impact to your top and bottom lines



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# Who's overseeing progress?

## Who *isn't*?

- ✓ Government Agencies
- ✓ Alliances
- ✓ Clubs
- ✓ NGO
- ✓ Non-profits
- ✓ Associations
- ✓ Foundations
- ✓ Forums
- ✓ Frameworks
- ✓ Accords
- ✓ Public Private Partnerships
- ✓ Charities
- ✓ Commissions (e.g. SEC, PUC's)
- ✓ Standards boards

- ✓ International
- ✓ National
- ✓ Regional
- ✓ State
- ✓ Municipal
- ✓ Cities
- ✓ Tribal
- ✓ Ethnic
- ✓ Activist Groups
- ✓ Corporations
- ✓ Utilities
- ✓ Asset Management Companies

# Key Environmental Metrics

## Usage



### ELECTRICITY

- Kilowatt hours (kWh)
- Energy Use Intensity (EUI)
- Renewable Generation



### GAS

- Cubic Feet (CF)
- British Thermal Units (Btu's)
- Therms (100k Btu)



### WATER

- Gal/min
- Gal/flush
- Gal/cycle



### MATERIAL

- Material Input per Unit of Output
- Waste Generation
- Recycling Rate

## Waste



### MATERIAL

- Total & per-capita waste
- Waste composition
- Recycling rate
- Waste to energy



### AIR

- Pollutant Concentrations
- Air Quality Index
- Health Impact



### TOXIC CHEMICALS

- Exposure Monitoring:
- Risk Assessment
- Substitution Rates
- Toxicity Profiles

## Other



### HEALTH & SAFETY

- Lost time rates
- Incident rates
- Safety Compliance



### PROCUREMENT

- Supplier Diversity
- Supplier Sustainability
- Ethical sourcing



# Reporting & Benchmarking



- ✓ Goal to transform the way that commercial buildings use energy.
- ✓ Measures, tracks and benchmarks energy performance of commercial/government buildings
- ✓ Energy Star certification indicates building performs in top 25% of like buildings.
- ✓ Cost-free verification available



**ENERGY STAR® Statement of Energy Performance**

77

ENERGY STAR®  
Score<sup>1</sup>

**Sample Property**

Primary Property Function: Office  
Gross Floor Area (ft²): 50,419  
Built: 1951

For Year Ending: July 31, 2014  
Date Generated: October 01, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information		
<b>Property Address</b> Sample Property 123 Main St Boston, Massachusetts 02134	<b>Property Owner</b> Property Inc. 123 Early Bird St. Washington, DC 20480 202-999-9878	<b>Primary Contact</b> Jane Doe 123 Early Bird St. Washington, DC 20480 555-123-4567 jane_doe@propertyinc.com
<b>Property ID:</b> 3881885		

Energy Consumption and Energy Use Intensity (EUI)			
<b>Site EUI</b> 75.7 kBtu/ft²	<b>Annual Energy by Fuel</b>		<b>National Median Comparison</b>
	Electric - Grid (kBtu)	2,453,824 (64%)	National Median Site EUI (kBtu/ft²) 103.5
	Natural Gas (kBtu)	1,273,766 (33%)	National Median Source EUI (kBtu/ft²) 247.6
	Propane (kBtu)	81,000 (2%)	% Diff from National Median Source EUI -27%
<b>Source EUI</b> 181.2 kBtu/ft²			<b>Annual Emissions</b> Greenhouse Gas Emissions (Metric Tons CO2e/year) 311

**Signature & Stamp of Verifying Professional**

I \_\_\_\_\_ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Licensed Professional**

John Smith  
4 Privet Dr  
Arlington, VA 22201  
703-111-1234  
john\_smith@energyinspectors.com

**Professional Engineer Stamp  
(if applicable)**

# Energy Use Intensity

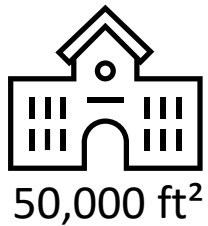
- Total energy used per sq ft per year
- Site & Source EUI



=



Example:



$$7.5\text{M kBtu} / 50,000 \text{ ft}^2 = \text{EUI of } 150$$

# Energy Use Intensity by Sector

Mkt Sector	Property Type	Source EUI (kBty/ft2)	Site EUI (kBty/ft2)
Food Sales & Service	Fast Food Restaurant	886.4	402.7
Food Sales & Service	Restaurant	573.7	325.6
Healthcare	Hospital (General Medical & Surgical)	426.9	234.3
Food Sales & Service	Convenience Store	592.6	231.4
Healthcare	Other/Specialty Hospital	433.9	206.7
Food Sales & Service	Supermarket/Grocery Store	444	196
Food Sales & Service	Bar/Nightclub	297	130.7
Technology/Science	Laboratory	318.2	115.3
Retail	Strip Mall	228.8	103.5
Retail	Retail Store	120.0	103.5
Public Services	Courthouse	211.4	101.2
Lodging/Residential	Residential Care Facility	213.2	99.0
Banking/Financial Services	Bank Branch	209.9	88.3
Education	College/University	180.6	84.3
Warehouse/Storage	Refrigerated Warehouse	235.6	84.1
Public Services	Library	143.6	71.6
Lodging/Residential	Prison/Incarceration	156.4	69.9
Retail	Enclosed Mall	170.7	65.7

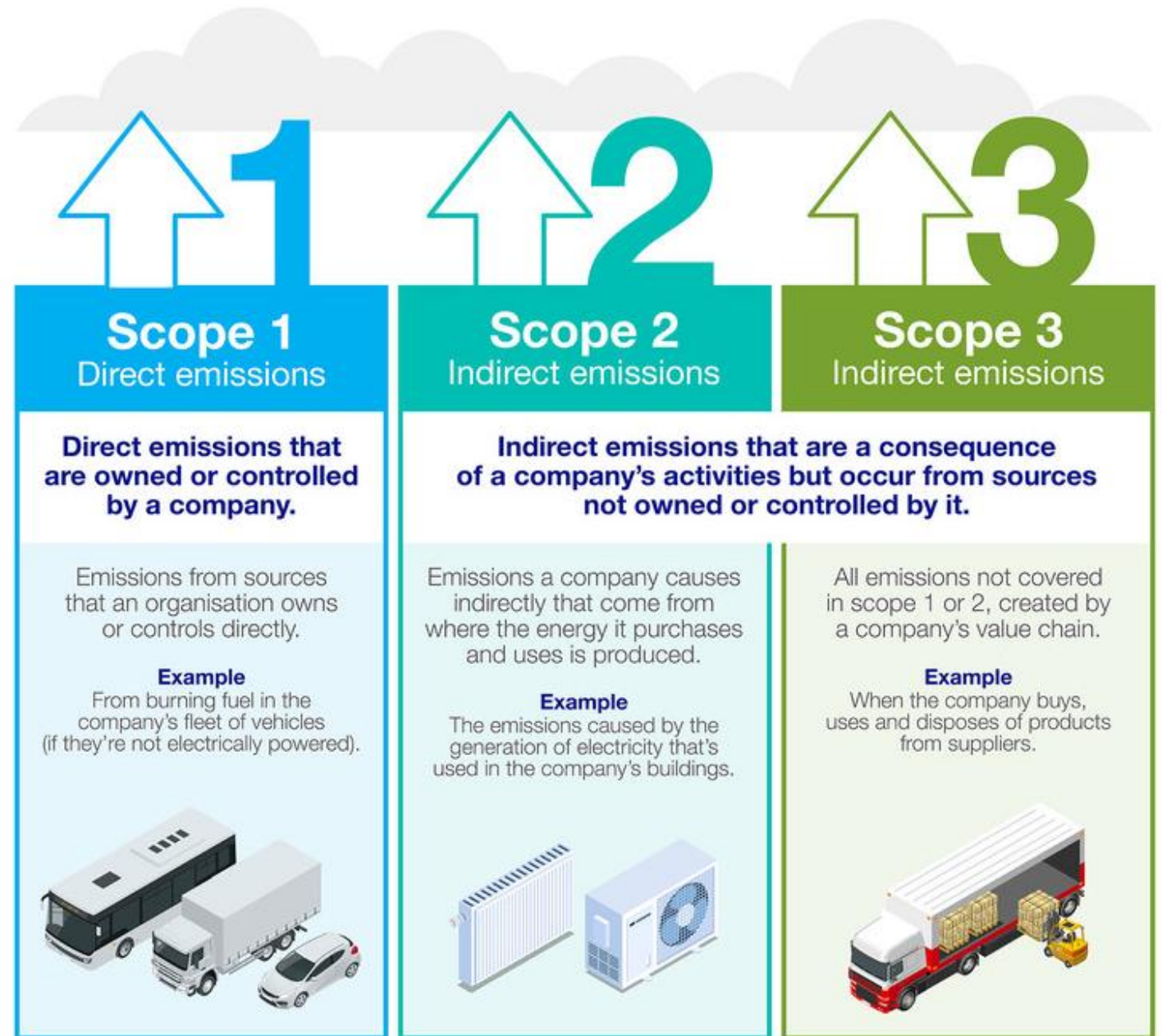
Mkt Sector	Property Type	Source EUI (kBty/ft2)	Site EUI (kBty/ft2)
Education	Pre-school/Daycare	131.5	64.8
Healthcare	Urgent Care/Clinic/Other Outpatient	145.8	64.5
Office	Veterinary Office	145.8	64.5
Public Services	Fire/Police Station	124.9	63.5
Lodging/Residential	Hotel	146.7	63.0
Healthcare	Ambulatory Surgical Center	138.3	62.0
Healthcare	Outpatient Rehabilitation/Physical Therapy	138.3	62.0
Lodging/Residential	Multifamily Housing	118.1	59.6
Lodging/Residential	Barracks	107.5	57.9
Lodging/Residential	Residence Hall/Dormitory	107.5	57.9
Public Assembly	Entertainment	112.0	56.2
Public Services	Transportation Terminal/Station	112.0	56.2
Public Assembly	Convention Center/Meeting Hall	109.6	56.1
Retail	Automobile Dealership	124.1	55.0
Banking/Financial Services	Financial Office	116.4	52.9
Office	Office	116.4	52.9

Mkt Sector	Property Type	Source EUI (kBty/ft2)	Site EUI (kBty/ft2)
Education	Vocational School/Adult Ed	110.4	52.4
Food Sales & Service	Wholesale Club/Supercenter	120	51.4
Healthcare	Medical Office	121.7	51.2
Office	Medical Office	121.7	51.2
Public Assembly	Recreation/Athletic Centers	112.0	50.8
Education	K-12 School	104.4	48.5
Public Services	Mailing Center/Post Office	96.9	47.9
Services	Dry cleaning, Shoe Repair, Locksmith, Salon, etc.	96.9	47.9
Mixed Use	Mixed Use Property	89.3	40.1
Utility	Energy/Power Station	89.3	40.1
Public Assembly	Worship Facility	58.4	30.5
Warehouse/Storage	Distribution Center	52.9	22.7
Warehouse/Storage	Non-Refrigerated Warehouse	52.9	22.7
Warehouse/Storage	Self-Storage Facility	47.8	20.2
Utility	Drinking Water Treatment & Distribution	5.9	2.3

# Greenhouse Gas Reduction

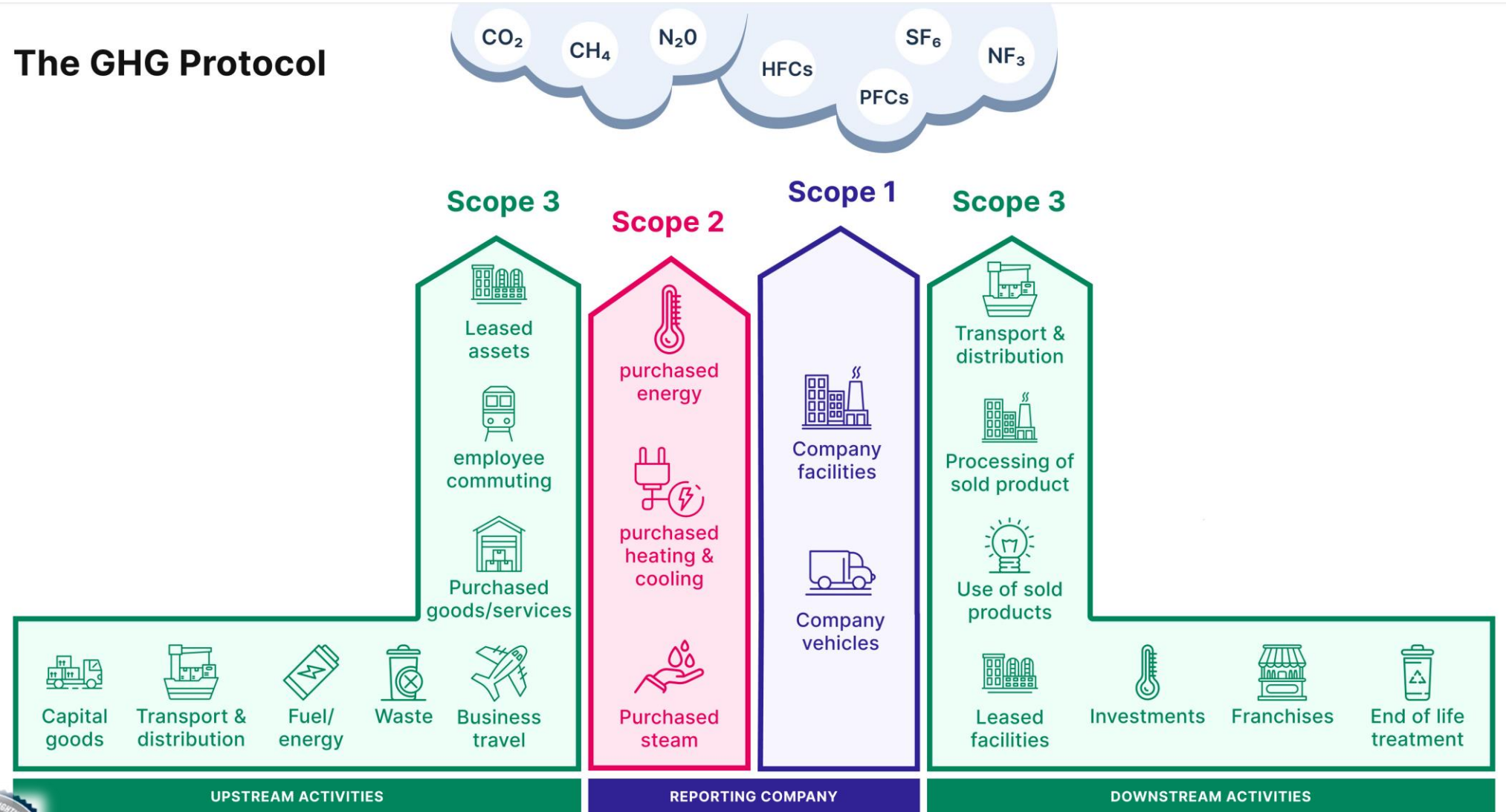


## GREENHOUSE GAS PROTOCOL



# Greenhouse Gas Reduction

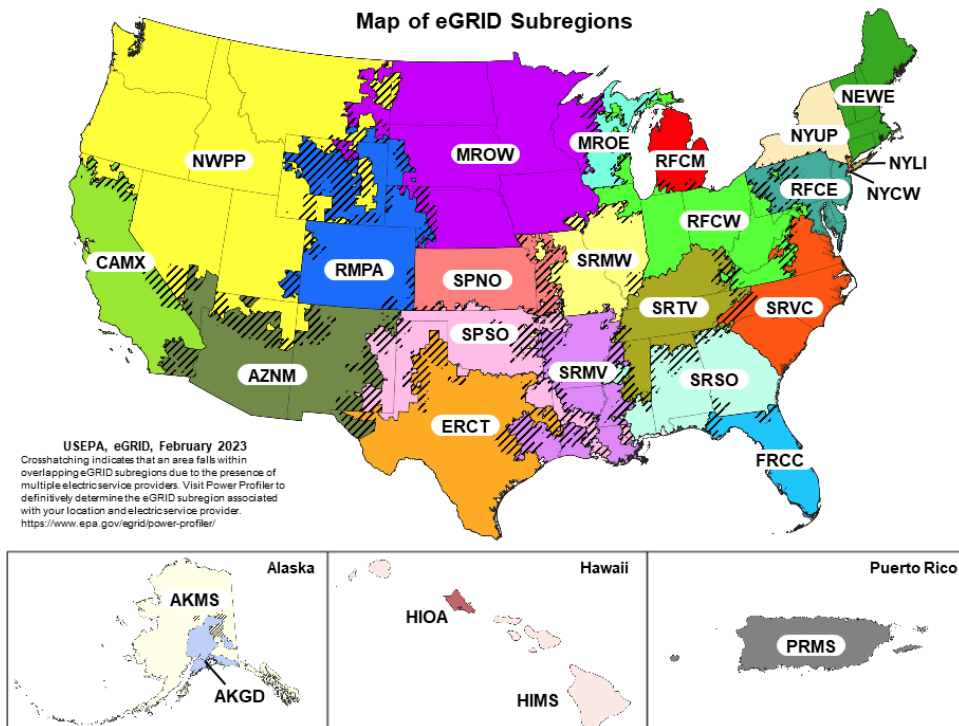
## The GHG Protocol



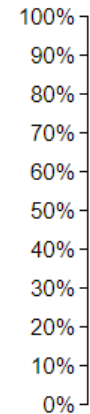
# Grid Emission Factor

## What is Grid Emission Factor (GEF)?

The Grid Emission Factor (GEF) measures the amount of carbon emissions per unit of electricity generated. This includes all generation sources such as natural gas, solar and waste-to-energy



Generation



- |                  |                            |
|------------------|----------------------------|
| Gas (27.7 %)     | Solar (0.3 %)              |
| Coal (35.6 %)    | Oil (0.3 %)                |
| Nuclear (28.5 %) | Geothermal (0 %)           |
| Hydro (1.1 %)    | Other Fossil Fuel (0.7 %)  |
| Wind (5.2 %)     | Other Unknown Fuel (0.1 %) |
| Biomass (0.5 %)  |                            |



## Energy Usage

	Pre-Project	Post-Project	Reduction
<b>Energy Use</b>	Existing kWh used in Project	Installed kWh used in Project	Pre-use – post use
<b>Energy Use Intensity (EUI) in kBtu/ft2</b>	1 kWh = 3.412141633 kBtu kBtu/ft2 = kBtu/ft2		
<b>Lighting Power Density (LPD)</b>	Total Light Load (watts) / Total Light Area		

## Greenhouse Gas Measures – RFC West Emission Rates

<b>Carbon Dioxide (CO2)</b>	(Existing kWh * CO2 Regional GEF * 0.001)	(Installed kWh * CO2 Regional GEF * 0.001)	(kWh Savings * CO2 Regional GEF * 0.001)
<b>Nitrous Oxide (N2O)</b>	(Existing kWh * N2O Regional GEF * 0.001)	(Installed kWh * N2O Regional GEF * 0.001)	(kWh Savings * N2O Regional GEF * 0.001)
<b>Methane (CH4)</b>	(Existing kWh * CH4 Regional GEF * 0.001)	(Installed kWh * CH4 Regional GEF * 0.001)	(kWh Savings * CH4 Regional GEF * 0.001)
<b>Sulfur Dioxide (SO2)</b>	(Existing kWh * SO2 Regional GEF * 0.001)	(Installed kWh * SO2 Regional GEF * 0.001)	(kWh Savings * SO2 Regional GEF * 0.001)
<b>Other GHG's</b>	Hydrofluorocarbons (HFCs) Perfluorocarbons (PFCs) Sulphur hexafluoride (SF6) Nitrogen trifluoride (NF3)		

## Environmental Equivalents – epa.gov calculator

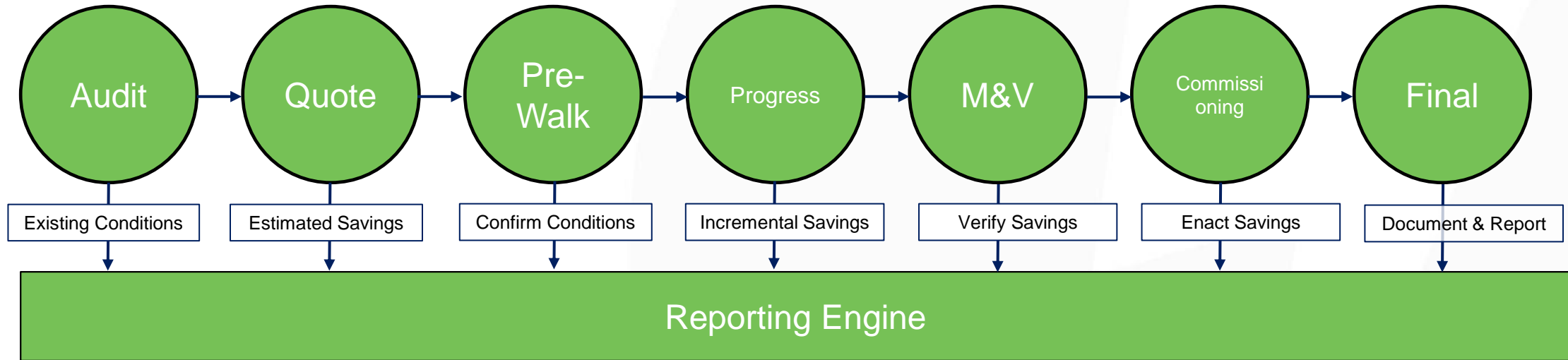
<b>Seedlings</b>	(Existing kWh * 0.0117181)	(Installed kWh * 0.0117181)	(kWh Savings * 0.0117181)
<b>Acres of Trees</b>	(Existing kWh * 0.0008677)	(Installed kWh * 0.0008677)	(kWh Savings * 0.0008677)
<b>Cars</b>	(Existing kWh * 0.0001540)	(Installed kWh * 0.0001540)	(kWh Savings * 0.0001540)
<b>Gallons of gasoline</b>	(Existing kWh * 0.0797439)	(Installed kWh * 0.0797439)	(kWh Savings * 0.0797439)



# Simplified, project-related reporting



# Reporting and project lifecycle data sets



Energy Savings		Annual Summary	Existing Definition	Solution	Savings	Assumptions	Close
Location / Area:		LIGHTING kWh	140,005	66,094	73,912		
--- All Areas (0 Elements)		ANNUAL kWh	\$28,805	\$60,807	\$69,129		
		ANNUAL DEMAND kW	\$1,358	\$545	\$758		
		Annual LIGHTING Savings	-	-	\$65,897		

Area/ Room	Fixture	Qty	kW	Burn	kWh	kWh\$	Proposed Action	Solution	Qty	kW	Burn	kWh	kWh\$	Savings						
														% Red.	% Cap.	kW	kWh	\$ kWh	\$ Demand	\$ Total
<b>Naperville / Office Area</b>																				
0.92 \$/kWh    0.20 \$/kW Demand																				
Office 101	#1 / F-F32T8-3	3	267	3,640	972	\$894	Retrofit	2x4 Flat Panel 38/29/23W DIM	3	114	3,640	415	\$382	0%	100%	353	557	512	24	536
	#2 / INCAN-60-1	3	380	3,640	655	\$603	Retrofit	9.2WLED/ROL/S 6/9/30/100V/6PK	3	028	3,640	100	\$92	0%	100%	352	555	510	24	534
Office 102	#3 / F-F32T8-3	3	267	3,640	972	\$894	Retrofit	2x4 Flat Panel 38/29/23W DIM	3	114	3,640	415	\$382	0%	100%	353	557	512	24	536
Office 103	#4 / F-F32T8-3	3	267	3,640	972	\$894	Retrofit	2x4 Flat Panel 38/29/23W DIM	3	114	3,640	415	\$382	0%	100%	353	557	512	24	536
Office 104	#5 / F-F32T8-3	3	267	3,640	972	\$894	Retrofit	2x4 Flat Panel 38/29/23W DIM	3	114	3,640	415	\$382	0%	100%	353	557	512	24	536
	#6 / INCAN-60-1	2	120	3,640	437	\$402	Retrofit	9.2WLED/ROL/S 6/9/30/100V/6PK	2	018	3,640	67	\$62	0%	100%	302	370	340	16	356
Office 105	#7 / F-F32T8-3	3	267	3,640	972	\$894	Retrofit	2x4 Flat Panel 38/29/23W DIM	3	114	3,640	415	\$382	0%	100%	353	557	512	24	536
Office 106	#8 / F-F32T8-3	3	267	3,640	972	\$894	Retrofit	2x4 Flat Panel 38/29/23W DIM	3	114	3,640	415	\$382	0%	100%	353	557	512	24	536

## Considerations:

- Precision lifecycle version control
- Include usage, savings & emissions metrics
- Include results, graphics and calculations
- Consider progressive project reporting for energy/emissions-sensitive customers



# Energy Performance Improvement Project



**Energy and Carbon Reduction Report**

## Espresso Enterprise Headquarters

**Primary Function:** Office Building  
**Gross Floor Area (sq. ft.):** 1,918  
**Built:** 1993

**Report Date:** 02/19/2024

### Property Contact Information

#### Property Address

1122 Main Ave  
Middleburg, CO 85888

#### Property Owner

Espresso Enterprise  
1122 Main Ave  
Centerville, CO 80123

#### Primary Contact

John Smith  
john.s@gmail.com  
330-556-5554

### Property Metrics

	Pre-Project	Post-Project	Reduction
--	-------------	--------------	-----------



**Energy Reduction**

151,293.000 kWh

10,286.480 kWh

141,006.520 kWh



**Reduction in Energy Use Intensity**



9.623 kBtu/ft<sup>2</sup>

#### Scope 2 GHG Reduction

*(Adjusted for grid region efficiency factor excluding grid gross loss - RFC West)*



**Carbon Dioxide**

158,267.607 lbs

10,760.687 lbs

147,506.921 lbs



**Nitrous Oxide**

2.118 lbs

0.144 lbs

1.974 lbs



**Methane**

14.373 lbs

0.977 lbs

13.396 lbs



**Sulfur Dioxide**

102.879 lbs

6.995 lbs

95.884 lbs

## Installed Lighting Power Density per Room

Totals		190	21,807			73	1,982	3,869	1,918	1.03
Area	Existing Fixture		Proposed Solution			Lighting Power Density				
Room	Existing	Qty	Watts	Proposed	Qty	Watts	Watts Saved	Room ft <sup>2</sup>	LPD (W/ft <sup>2</sup> )	
<b>Middleburg / Office Area</b>										
Office 101	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 101	INCAN-I60-1	3	180	(1) S11641	3	28	152	65	0.4	
Office 102	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	45	1.2	
Office 103	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 103	INCAN-I60-1	5	300	(1) S11641	5	46	254	54	0.8	
Office 104	F-F32T8-3	3	267	3L 10W Dimmable 30K	5	150	117	75	2.0	
Office 104	INCAN-I60-1	2	120	(1) S11641	2	18	102	54	0.3	
Office 105	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 106	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 107	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 108	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 109	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 110	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 111	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 112	F-F32T8-3	3	267	3L 10W Dimmable 30K	3	90	177	75	1.2	
Office 113	F-F32T8-3	3	267	3L 10W Dimmable 30K	5	150	117	75	1.2	
Hallway	F-F32T8-3	30	2,670	3L 10W Dimmable 30K	20	600	1,180	800	0.7	

# In Conclusion

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- ✓ **Sustainability & environmental** impact are increasing in importance to your customers
- ✓ **You** are the best resource to inform and advise them on project impact
- ✓ Keep it **simple, accurate** and **relevant** to their data reporting needs



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# THANK YOU!



**SNAPCOUNT**<sup>®</sup>  
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