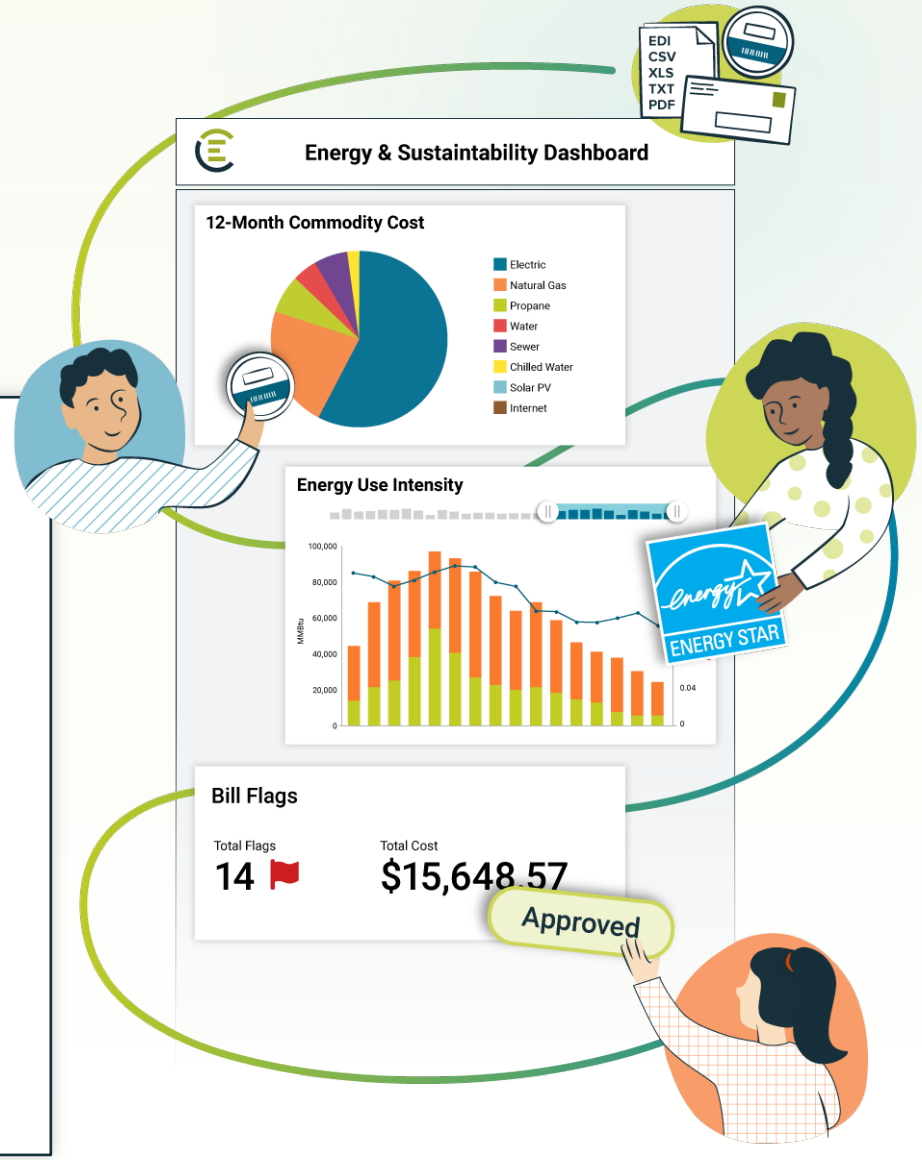
ENERGYCAP®

How EnergyCAP is using EnergyCAP

Lalit Agarwal

VP of Energy Management & Sustainability

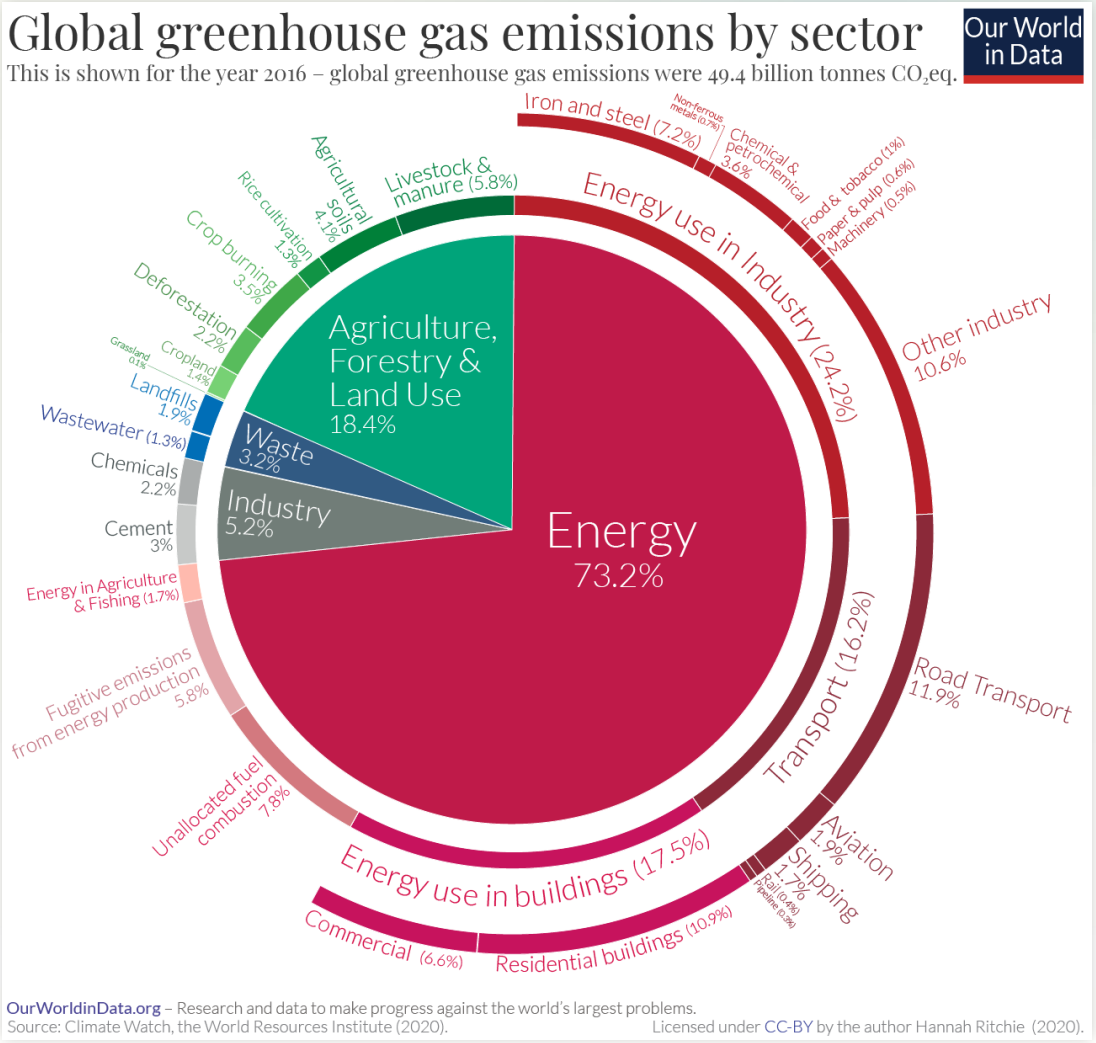
EnergyCAP



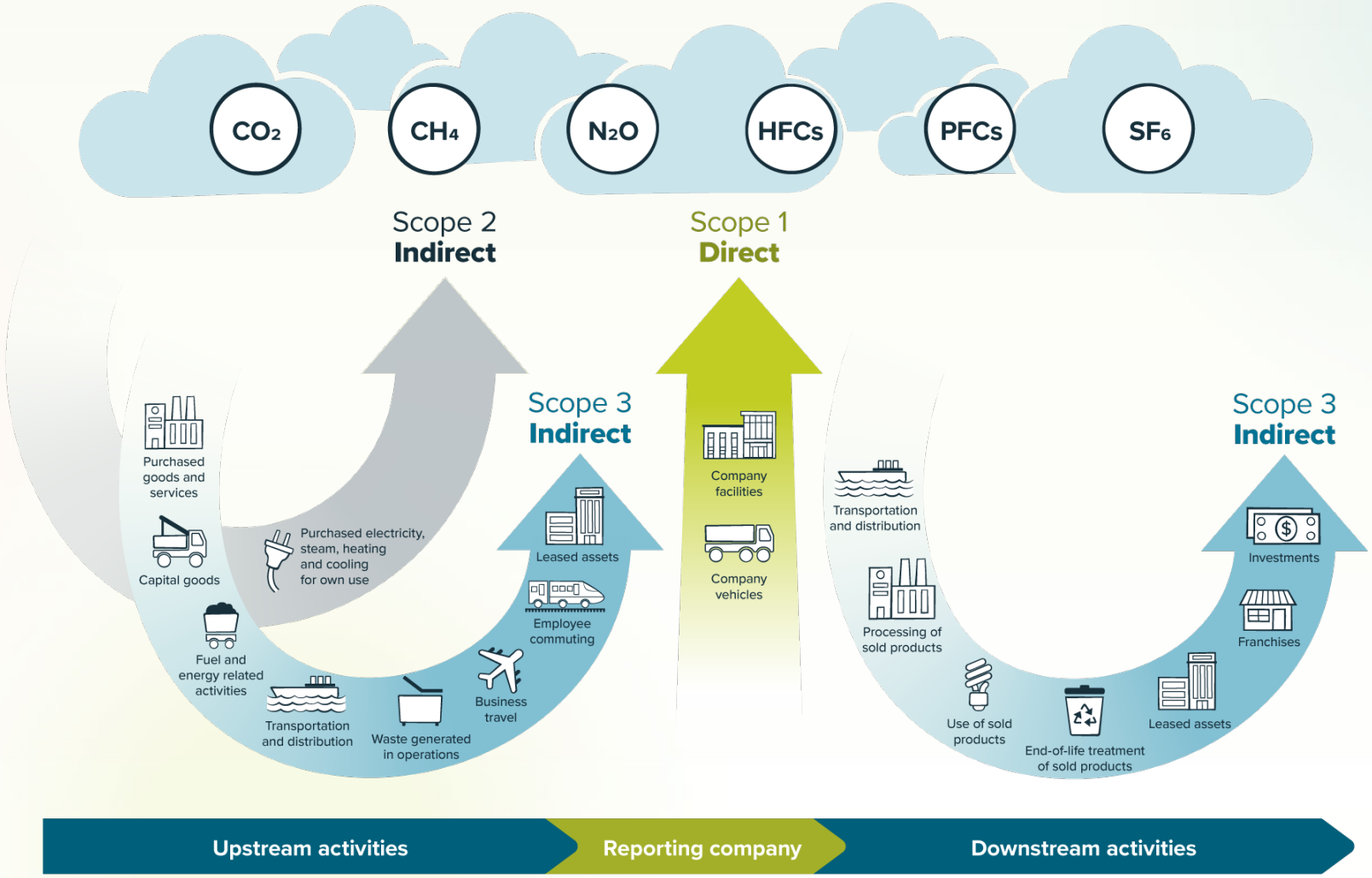
Fundamentals of Greenhouse Gases

GHG Sources

- Energy needs of human activity (anthropogenic emissions)
- Common GHGs
  - CO_2
  - N_2O
  - CH_4
- Fugitive emissions from refrigerants
- Typically reported in CO_2 equivalent



Greenhouse Gases (GHG) Scopes



GHG Scopes // It's a matter of perspective

Natural gas

Emissions count toward Scope 1

Electricity

Emissions count toward Scope 2

Carbon Accounting for EnergyCAP

Energy and sustainability ERP // The single source of truth

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Persona:
Energy/facilities

CAPture Services: Bill CAPture, Bill Processing/Managed Services

Process

- Walk the talk
  - Understand our impact on the environment
  - Leverage the technology we built
  - Understand the process our clients would undertake
- Get buy-in
  - The senior leadership of the organization (ELT/CEO/CFO)
  - Some data may be proprietary or sensitive

Where do you start?

- Identify what applies to your operations
- Guidance for Scope 1, 2 and 3 from GHG Protocol (https://www.ghgprotocol.org)

Scope 1

Fugitive Emissions	Direct emissions from refrigeration and air conditioning result from leakage and service over the operational life of the equipment. The leakage of refrigerant gas is a small but significant source of GHG emissions because of a high GWP associated with these GHGs.
Mobile Combustion	Direct emissions from owned or leased mobile sources (both on-road and non-road vehicles) that are within the company's inventory boundaries.
Stationary Combustion	Direct emissions typically from devices that combust solid, liquid or gaseous fuel, generally for the purposes of producing electricity, generating steam or heat.

Scope 1 // As it applies to EnergyCAP

Fugitive Emissions	Direct emissions from refrigeration and air conditioning result from leakage and service over the operational life of the equipment. The leakage of refrigerant gas is a small but significant source of GHG emissions because of a high GWP associated with these GHGs.
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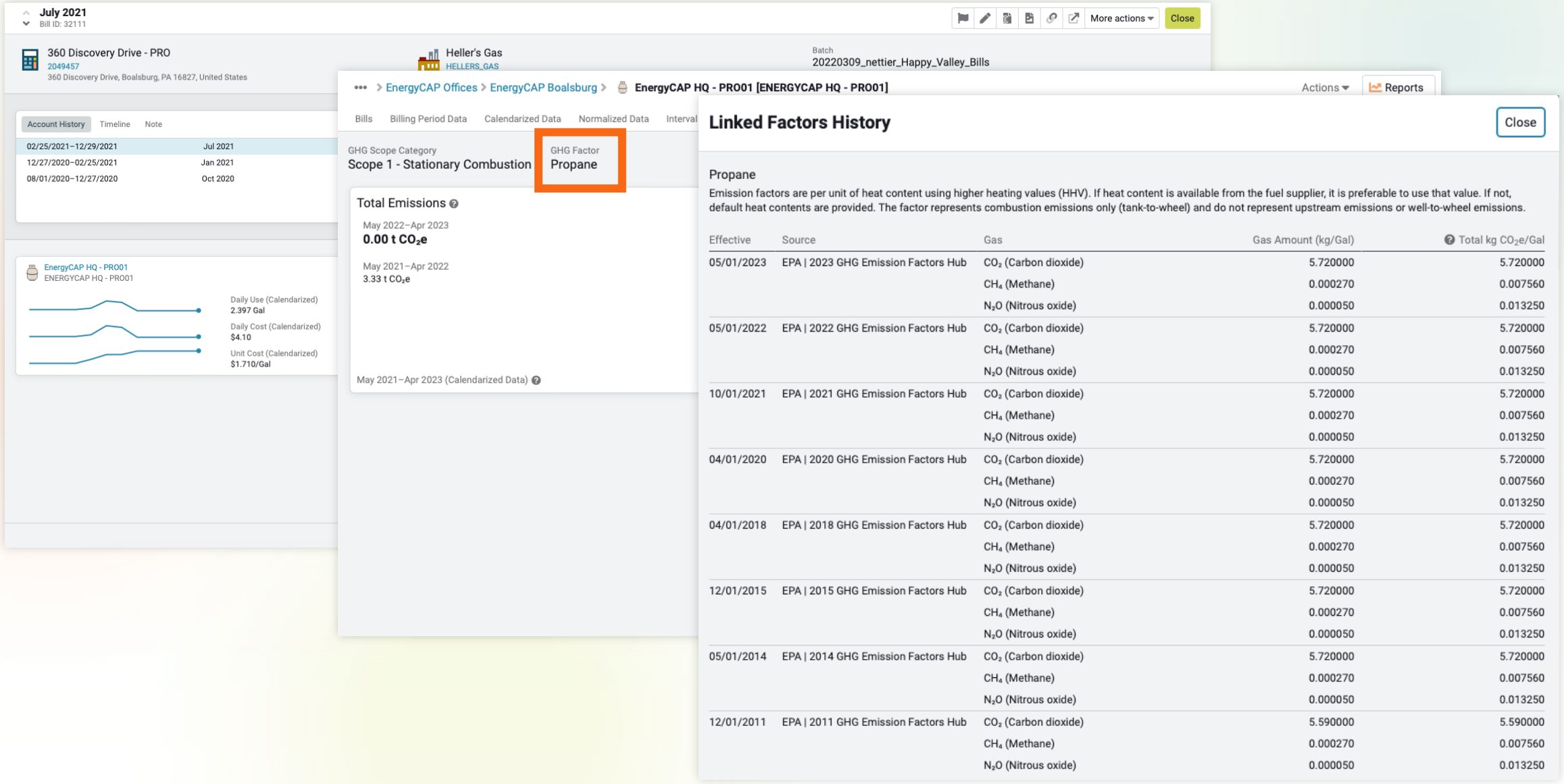
Propane at Boalsburg Office



Effective	Source	Gas	Gas Amount (kg/Gal)	Total kg CO_2e/Gal
05/01/2023	EPA | 2023 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
05/01/2022	EPA | 2022 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
10/01/2021	EPA | 2021 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
04/01/2020	EPA | 2020 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
04/01/2018	EPA | 2018 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
12/01/2015	EPA | 2015 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
05/01/2014	EPA | 2014 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.720000	5.720000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250
12/01/2011	EPA | 2011 GHG Emission Factors Hub	CO_2 (Carbon dioxide)	5.590000	5.590000
		CH_4 (Methane)	0.000270	0.007560
		N_2O (Nitrous oxide)	0.000050	0.013250

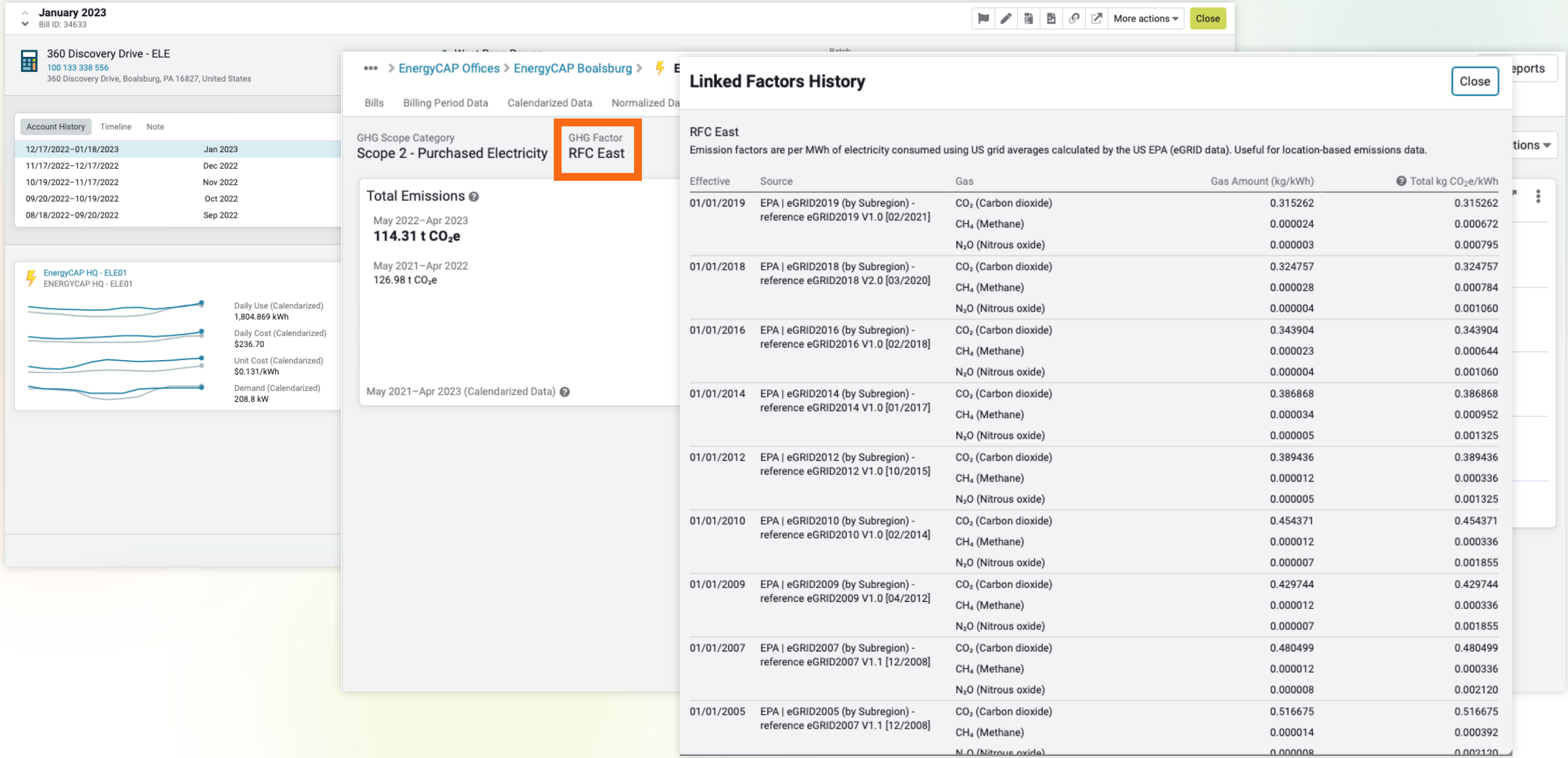
Scope 2

Purchased Cooling	Indirect emissions from purchased or acquired cooling.
Purchased Electricity	Indirect emissions from purchased or acquired electricity.
Purchased Heat	Indirect emissions from purchased or acquired heat.
Purchased Steam	Indirect emissions from purchased or acquired steam

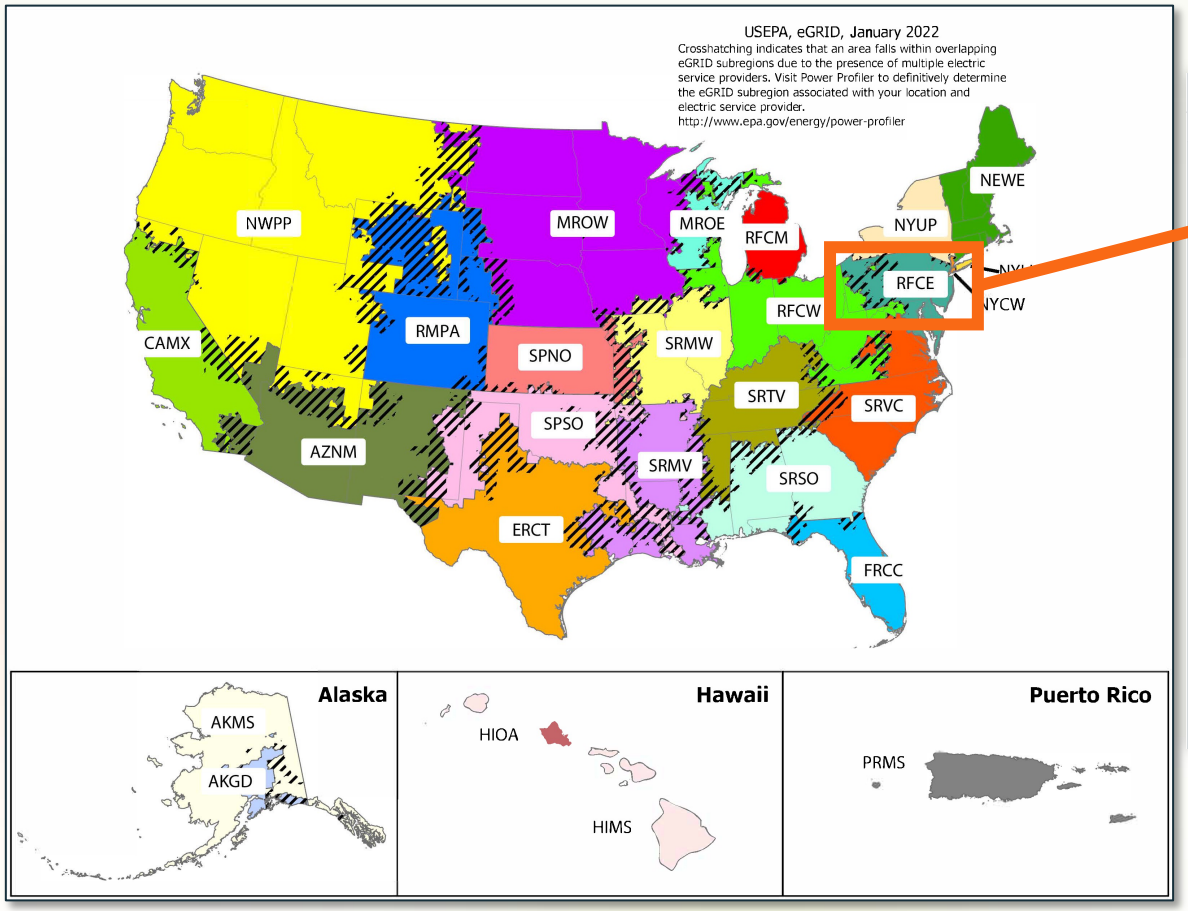
Scope 2 // As it applies to EnergyCAP

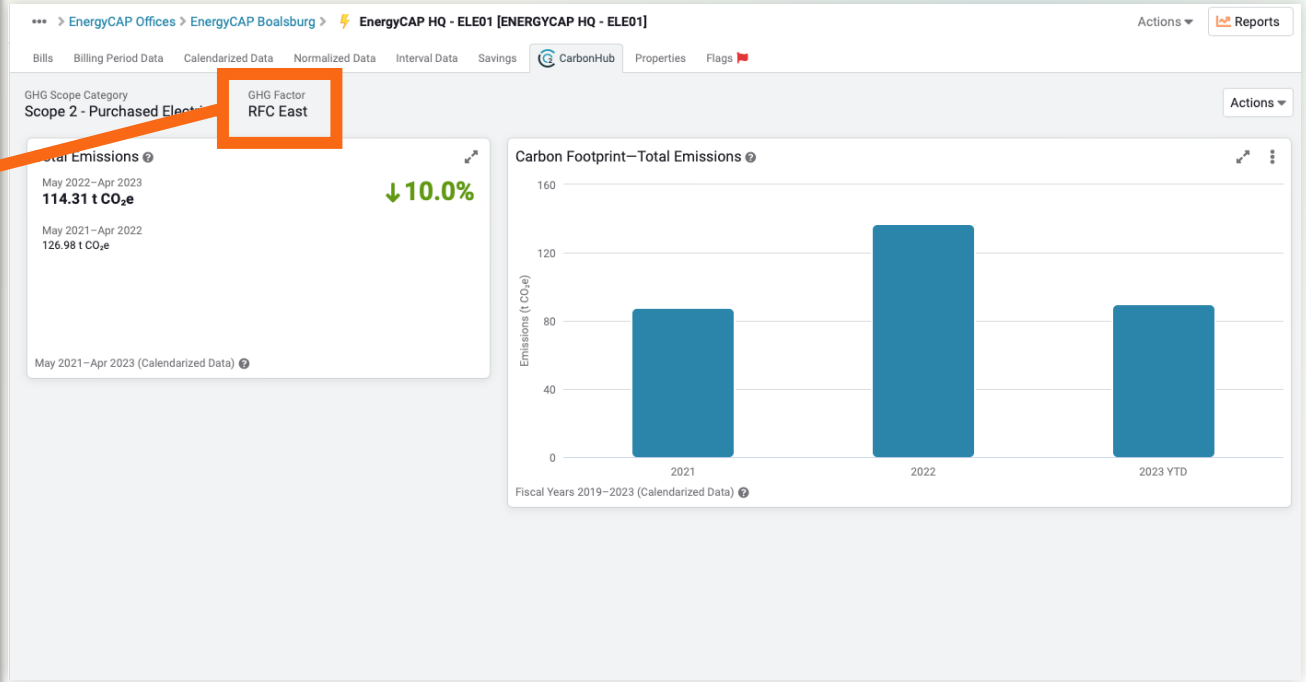
Purchased Cooling	Indirect emissions from purchased or acquired cooling.
Purchased Electricity	Indirect emissions from purchased or acquired electricity.
Purchased Heat	Indirect emissions from purchased or acquired heat.
Purchased Steam	Indirect emissions from purchased or acquired steam

Electricity at Boalsburg Office



Scope 2 // Electricity – location-based reporting

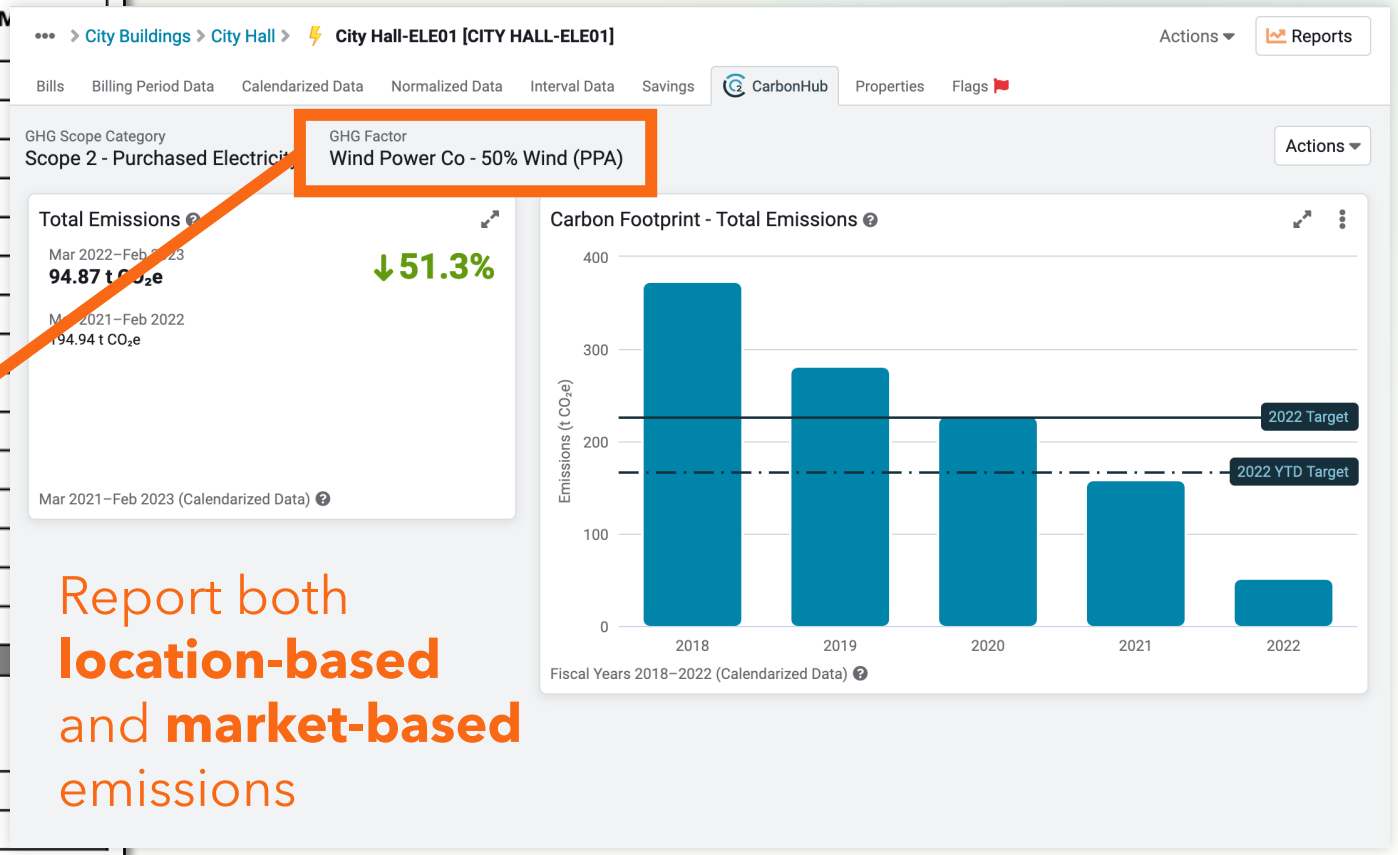




Use location-based factors from EPA (US) eGrid, IEA and other agencies

Scope 2 // Electricity – market-based reporting

Source	PJM* System Mix	Large Commercial WGL Energy Fuel Mix	Small Commercial (3.5% PJM* Wind Included)	Residential (5% Wind PJM* Included)	50% Local PJM* Wind	100% Local PJM
Coal	21.3%	18.5%	17.7%	17.4%	7.8%	
Gas	38.7%	34.1%	32.8%	32.2%	14.8%	
Nuclear	33.0%	28.7%	27.6%	27.1%	12.2%	
Oil	0.2%	0.2%	0.2%	0.2%	0.1%	
Renewable Energy						
Captured Methane Gas	0.2%	0.2%	0.2%	0.2%	0.1%	
Geothermal	0.0%	0.0%	0.0%	0.0%	0.0%	
Solar Voltaic	1.0%	2.9%	2.9%	2.9%	2.4%	
Solar Thermal	0.0%	0.0%	0.0%	0.0%	0.0%	
Solid Waste	0.5%	1.4%	1.4%	1.4%	1.2%	
Hydro-electric	1.2%	2.6%	2.5%	2.5%	2.0%	
Wind	3.6%	8.3%	11.7%	13.1%	56.5%	
Wood or other Biomass	0.2%	3.1%	3.1%	3.1%	3.0%	
Other	0.0%	0.0%	0.0%	0.0%	0.0%	
Total	100.0%	100.0%	100.0%	100.0%	100.0%	
Air Emissions (lbs. per MWh)						
Sulphur Dioxide (SO_2)	0.48	0.48	0.46	0.46	0.24	
Nitrogen Oxides (NO_x)	0.36	0.40	0.39	0.38	0.22	
Carbon Dioxide (CO_2)	827.52	750.85	721.89	709.47	337.09	



Report both **location-based** and **market-based** emissions

Scope 3 Categories

Upstream	Downstream
01. Purchased Goods and Services	09. Downstream Transportation & Distribution
02. Capital Goods	10. Processing of Sold Products
03. Fuel and Energy Related Activities	11. Use of Sold Products
04. Upstream Transportation & Distribution	12. End-of-life Treatment of Sold Products
05. Waste Generated in Operations	13. Downstream Leased Assets
06. Business Travel	14. Franchises
07. Employee Commuting	15. Investments
08. Upstream Leased Assets	

https://ghgprotocol.org/scope-3-calculation-guidance-2

Scope 3 Categories // As it applies to EnergyCAP

Upstream	Downstream
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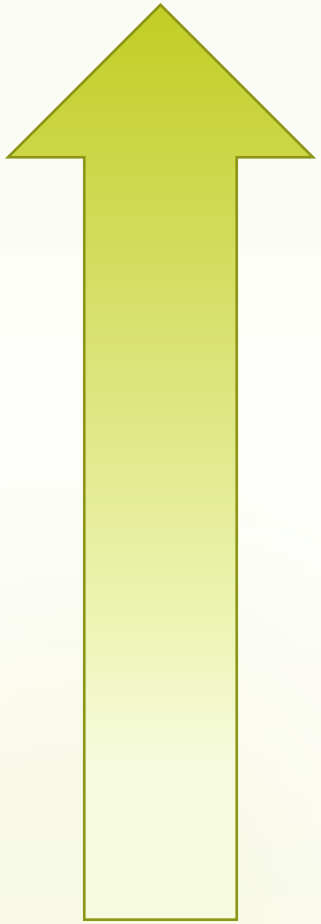
Options for Scope 3 reporting

Most Detailed/Accurate



Detailed GHG values from suppliers/vendors

Actual use/purchase quantities x GHG factors

Estimated use/purchased quantities x GHG factors

Least Detailed/Accurate

Actual spending/cost x spend-based GHG factors

Options for Scope 3 reporting

Most Detailed/Accurate

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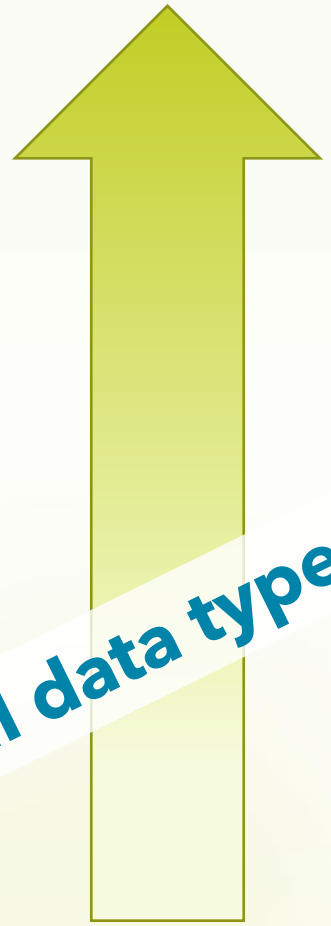


Not all data types require the same level of detail

Live Demo

Tracking Scope 1, 2, and 3 emissions in CarbonHub

Track purchased utilities at the level of detail you have

Track individual utility bills when available or

Track monthly, quarterly, or annual data

Record date range and quantity

Map supply chain and other data to GHG factors

CarbonHub includes many built-in factors:

Published **EPA & IPCC** values for raw fuels

EPA eGrid & IEA electricity factors

EPA, Defra, EcoInvent, and other published Scope 3 and lifecycle assessment (LCA) factors

CarbonHub enables custom factors:

Factors from suppliers/vendors (PPAs)

Custom fuel mix for your organization

Custom supply-chain emission factors

GHG Protocol provides guidance for capturing Scope 3 for your business

CarbonHub can accommodate all those scenarios

https://ghgprotocol.org/sites/default/files/2022-12/Intro_GHGP_Tech.pdf

Track Offsets and Renewable Energy Credits (RECs)

- Carbon Offsets and RECs
  - Carbon Offsets: Scope 1
  - Carbon Offsets: Scope 2
  - Carbon Offsets: Scope 3
  - Electric RECs (non-solar)
  - Solar RECs (SRECs)

GHG Scope Category
Scope 2 - Carbon Offsets and Adjustments (Scope 2)

GHG Factor
Carbon Offset

Actions

Total Emissions

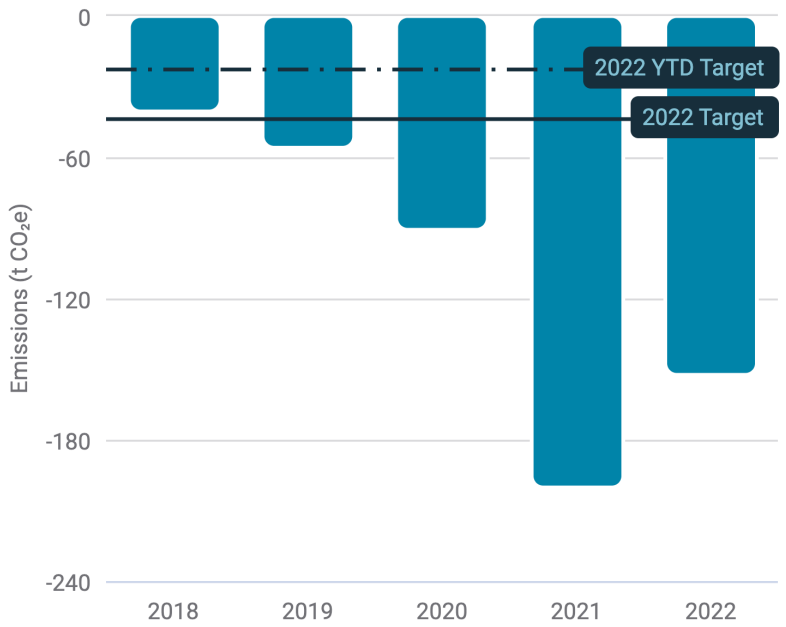
Mar 2022–Feb 2023
-251.51 t CO_2e

↓90.1%

Mar 2021–Feb 2022
-132.33 t CO_2e

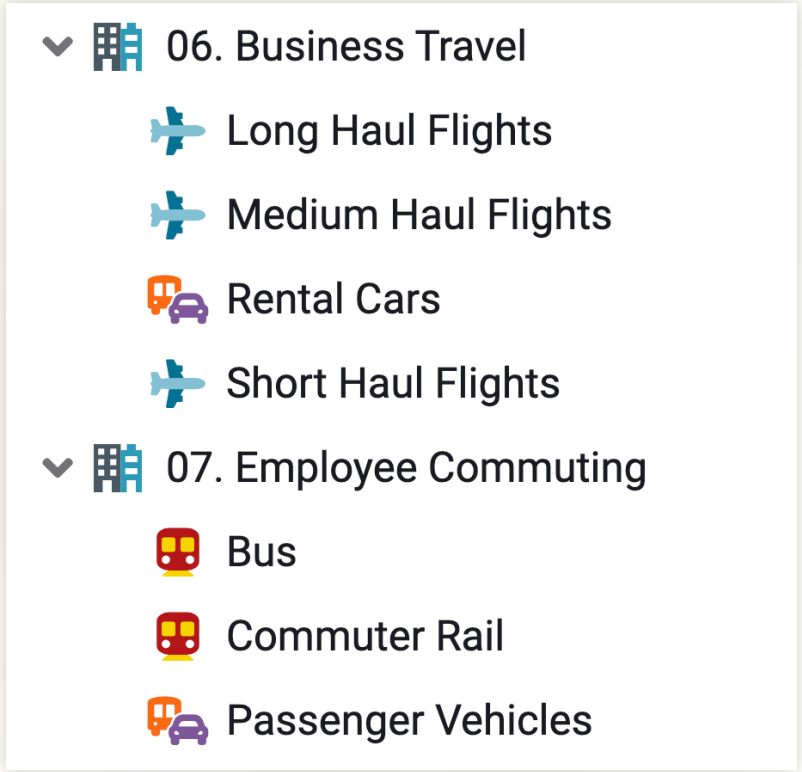
Mar 2021–Feb 2023 (Calendarized Data)

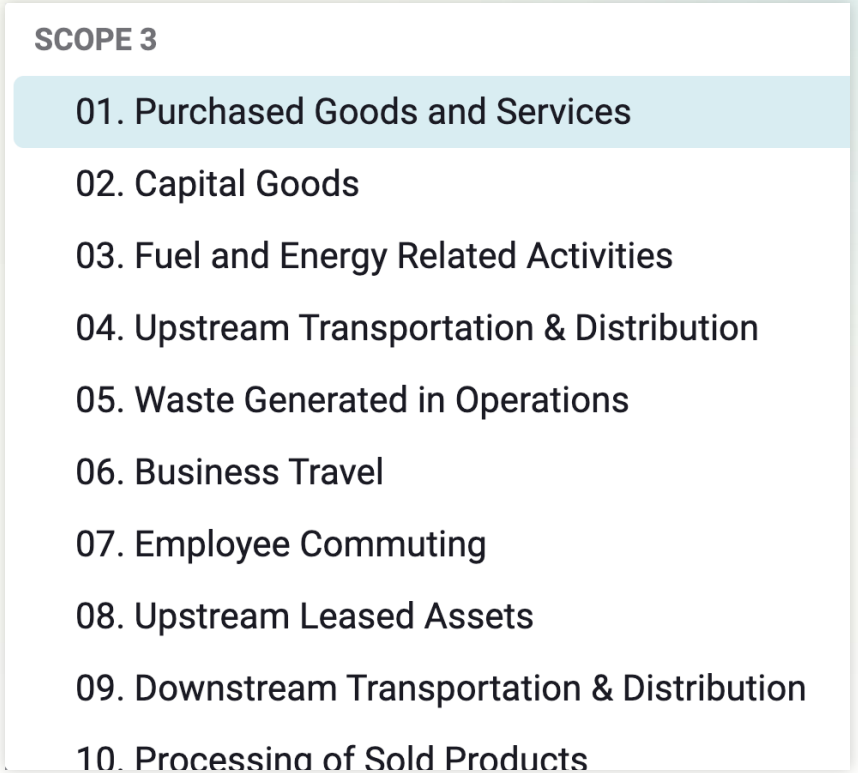
Carbon Footprint - Total Emissions



Fiscal Years 2018–2022 (Calendarized Data)

Scope 3 // Use, volume, distance, and weight-based tracking





What's Next

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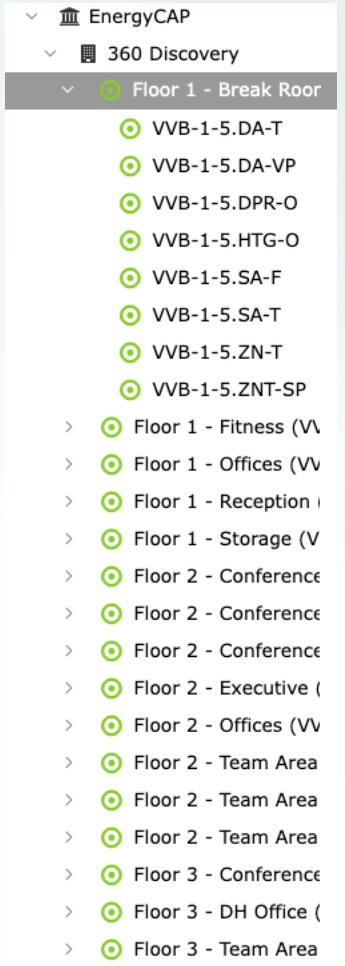
Real-time Smart Analytics // Wattics

- Integrate BAS data (MetaSys)
- Analyze building HVAC performance
- Better manage our facilities



We have good reporting, now we focus on detail tracking, alarming, alerting, and actionable intelligence

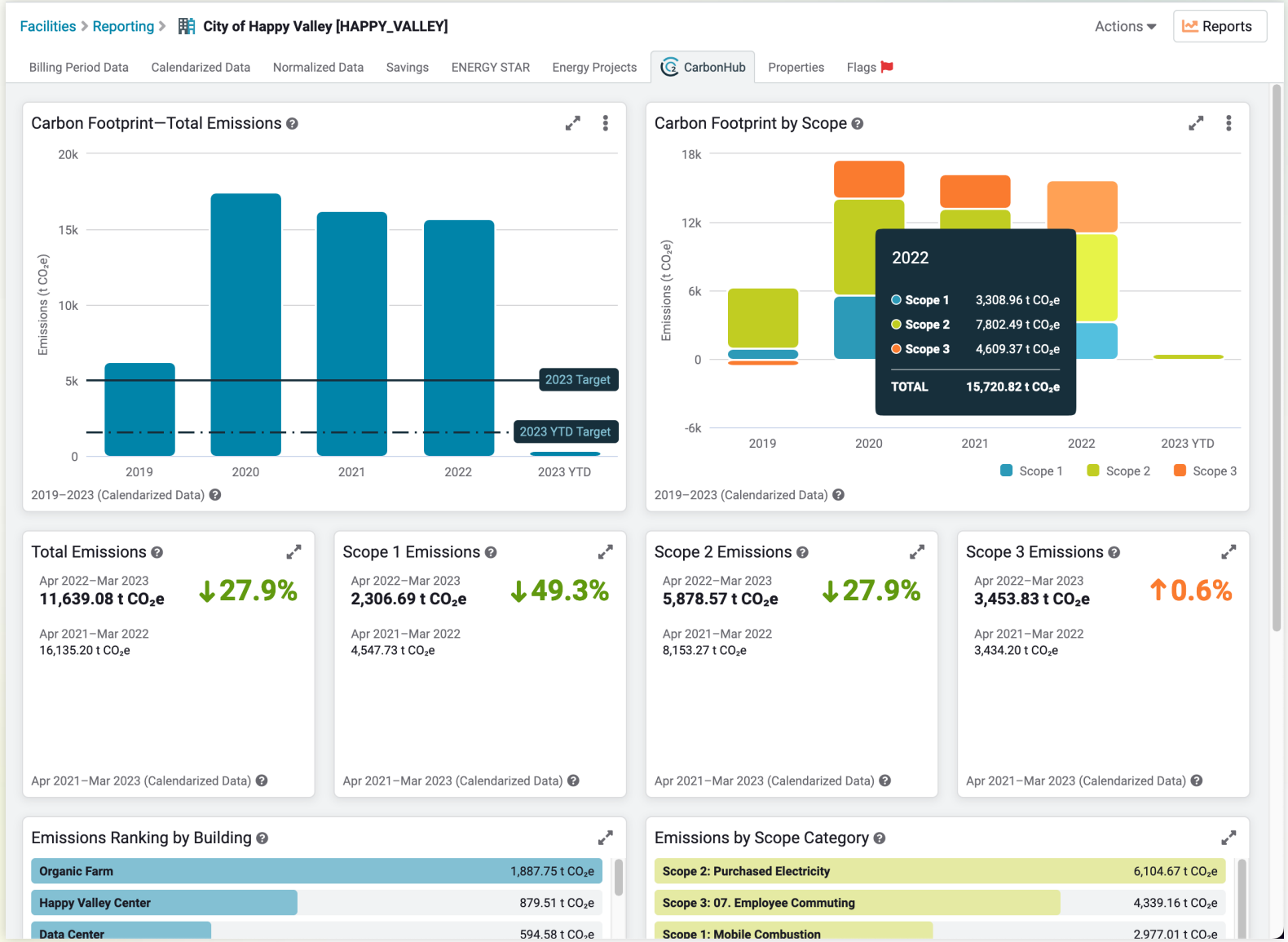
Single Source of Truth

Insights into your organization's Energy and Sustainability

Aggregate energy and emissions data across your organization

Visual insights into where your energy and emissions are allocated and opportunities for improvement projects

Report progress towards goals over time



CATALYST ROADSHOW

Tuesday September 12th - Oakland, California

Friday September 15th - Frisco, Texas

ENERGYCAP®

Thank you