Credibility Assessment of Emissions Data: Floodlight and Industry Providers, U.S. Meat Processing Facility (2024)

Executive Summary

A major insurance company engaged three sustainability analytics providers—including two established industry leaders and Floodlight—to quantify emissions and Value at Risk (VaR) for a 358,000 sq. ft. meat processing facility in the U.S. Midwest. The facility produces both raw and fully cooked proteins, including ready-to-eat items such as bacon, and its reliance on refrigeration, cooking, and sanitation makes it highly energy intensive.

The insurance company further asked Floodlight to substantiate our results against those of Vendor 1 (V1) and Vendor 3 (V3). Our analysis found that V1's reported Scope 1 emissions and Scope 2 emissions (based on an analysis of electricity usage) are implausibly low for a facility of this size and likely operational intensity, while V3's data was incomplete and inaccurate from the outset.

In contrast, Floodlight's results, which leverage satellite-based measurement and proprietary large language model (LLM) AI systems, align with sector benchmarks, underscoring significant shortcomings in the vendor-reported data. If relied upon for internal standards—such as green lending or underwriting frameworks—V1's or V3's numbers could expose the company to reputational risk, accusations of greenwashing, or even claims of misrepresentation.

Vendor Comparison Data Table of Specified Asset

VENDOR	1	FL	3
Building Size (sqft)	353,129	358,586	29,450
Parcel size (sqft)		2,077,560	
Value total $		$ 26,499,961	$ 200,000,000
Valye $ per sqft		$ 74	$ 6,791
VaR $		$ 52,575	
VaR %	12.9%	0.20%	19.84%
Active risk (1 in 500-yr event)	0.2%		
VaR context	2030	Annual	% of capital value, 2050 VaR
VaR Scenario	SSP 5-8.5 , 1 in 500y	Industry risk assumptions	
Scope 1 (kg CO2)	84,751	1,199,100	
Scope 2 (kg CO2)	772,773	21,109,300	
Scope 1 (kg CO2/sqft)	0.24	3.34	
Scope 2 (kg CO2/sqft)	2.21	58.87	
Scope 1 (kg CO2/sqm)	2.58	35.99	
Scope 2 (kg CO2/sqm)	23.79	633.65	
Total Scope 1+2 Intensity (kgCO2/sqft)	2.45	94.86	
Total Scope 1+2 Intensity (kgCO2/sqm)	26.37	669.65	
Market Proxy (kgCO2/sqm)			*271.2*
Electricity (kwh)	1,537,400	31,464,653	
Gas (kwh)	370,013	n/a	
ITR			2.5

Note: this data table was provided by the insurance company after Floodlight submitted its findings. The Scope 1 emissions noted as reported by Floodlight (1,199,100 kg) were the total CO2e emissions of all GHG Protocol gases measured at the site, whereas 1,178,800 kg of this total were emissions related specifically to CO2, which was the value used to compare CO2 specifically against V1's value in the underlying analysis.

Key Findings

- **V3's reporting** was insufficient and inaccurate, including a failure to correctly capture the facility's square footage, or any emissions values, which rendered their data unsuitable for comparison.
- **V1's Scope 1 emissions** appear materially understated — more consistent with the heating needs of a small office building than with a **358,000 sq. ft. meat processing facility** that requires significant energy for refrigeration, cooking, and sanitation.
- **V1's reported electricity usage** (and therefore Scope 2 emissions, which are directly proportional to electricity usage) also appear materially understated – more aligned to a basic dry warehouse rather than a protein-processing facility with likely high-intensity energy demands such as refrigeration, steam generation, hot water, and plastics processing.
- **Value-at-Risk (VaR) outputs** from both V1 and V3 are skewed due to reliance on incomplete datasets and the omission of property tax records, leading to results that diverge from credible industry norms.
- **Floodlight's analysis**, grounded in satellite-based measurement and proprietary LLM-driven AI models, is consistent with established benchmarks for this sector—highlighting the disconnect between V1's reported values and industry expectations.

Risk Implications

If the insurance company applies its own green lending or underwriting standards, or is a signatory to frameworks that require accurate and transparent emissions reporting, reliance on V1's or V3's emissions data would create both compliance and reputational risks. Their figures—either implausibly low or incomplete—could be interpreted as artificially favorable disclosures, raising concerns of greenwashing. In certain contexts, presenting such numbers could also constitute a misrepresentation of climate risk exposure, with potential regulatory and liability implications. By contrast, Floodlight's benchmark-aligned results provide a defensible and credible basis for decision-making.

Conclusion

Floodlight's results are methodologically robust and empirically credible, aligning with established benchmarks for emissions in this sector. By contrast, V1 and V3's outputs contain objective inaccuracies—ranging from implausibly low emissions estimates to insufficient facility characterization—that undermine their reliability.

Relying on such data not only produces misleading insights but could also expose the insurance company to reputational harm, accusations of greenwashing, or potential misrepresentation of climate-related risk. Taken together, these findings demonstrate that among the three vendors evaluated, Floodlight's data provides the most credible and defensible foundation for assessing emissions at this facility.

Comparison of Reported Values

Scope 1 (Direct fuel use)

Category	V1 Reported	Floodlight Reported	Benchmark
Scope 1 (Direct fuel)	84,751 kg CO_2 (equates to circa 1,598,000 kBtu/1,600 MMBtu natural gas per year, or **4.5 kBtu/ft²·yr**)	1,178,800 kg CO_2 (equates to circa 22,216,000 kBtu/22,216 MMBtu natural gas per year, or **61.9 kBtu/ft²·yr**)	**30–100+ kBtu/ft²·yr**[1]

Note: for purposes of comparison, the facility square footage reported by Floodlight of 358,586 sqft was used for calculation purposes, which is based on property records. Floodlight reported 1,178,800 kg CO2 as part of the total Scope 1 emissions of 1,199,100 kg CO2e emissions as noted in the data table. For calculation purposes, Scope 1 combustion assumes natural gas. US EPA emissions factor for natural gas utilized**:** 53.06 kg CO_2 equates to circa 1 MMBtu (million Btu) of natural gas combusted.[2]

- V1 value: 84,751 kg CO_2 ≈ 1,600 MMBtu total fuel use → ~4.5 kBtu/ft²·yr. This is lower than a typical small office building's heating load.
- Floodlight value: 1,178,800 kg CO_2 ≈ 22,216 MMBtu → ~61.9 kBtu/ft²·yr. This is within the 30–100+ kBtu/ft²·yr range for manufacturing plants with steam/hot water needs.

Conclusion: V1 appears to have missed parcel-level combustion sources; the Floodlight value is plausible given the size and usage of the facility.

Electricity Usage / Scope 2 Emissions

Category	V1 Reported	Floodlight Reported	Benchmark
Electricity Usage Per Data Table	1,537,400 kWh (1.54 GWh) (**4.3 kWh/ft²·yr**)	31,464,653 kWh (31.5 GWh) **(87.7kWh/ft²·yr)**	95.1 kWh ft²·yr[3]

- V1: 1.54 GWh → 4.3 kWh/ft²·yr. Equivalent to the annual energy use of a basic dry warehouse of this size, far below electricity consumption expected for a 358k ft² meat processing plant.
- Floodlight value: 31.5 GWh → 87.7 kWh/ft²·yr. On average, manufacturing facilities use 95.1 kilowatt-hours (kWh) of electricity per square foot each year, though actual consumption varies across subsectors.

Conclusion: V1's electricity usage value is an order of magnitude too low and likely undercounts electricity usage substantially, which directly affects V1's Scope 2 emissions value. Floodlight's electricity usage value (and therefore Scope 2 emissions value) is realistic for a facility with heavy refrigeration and cooking activities.

[1] https://www.eia.gov/consumption/commercial/data/2018/pdf/CBECS%202018%20CE%20Release%202%20Flipbook.pdf
[2] https://www.epa.gov/climateleadership/ghg-emission-factors-hub
[3] https://esource.bizenergyadvisor.com/article/manufacturing-facilities