



## INDEPENDENT ASSESSMENT REPORT

Industry Emission Factor Computational Methodology Review for  
DitchCarbon

August 1<sup>st</sup> 2025

### Abstract

DitchCarbon is a climate technology company that provides emissions intelligence tools to help organizations measure, manage, and reduce their carbon footprint. Their platform offers granular emissions data and analytics, with a particular focus on Scope 3 emissions, which are typically the most complex and opaque to quantify. DitchCarbon leverages a combination of artificial intelligence, industry-specific datasets, and quality assurance processes to generate emission factors and align them with client activities. This review focuses on evaluating the computational methodology behind their industry emission factor calculations, with an emphasis on transparency, accuracy, and alignment with established frameworks such as the Greenhouse Gas Protocol.

# Contents

Contents .....	1
<b>1. Introduction .....</b>	<b>2</b>
<b>2. Scope of Assessment.....</b>	<b>3</b>
<b>3. Objectives .....</b>	<b>4</b>
<b>4. Methodology of Assessment.....</b>	<b>5</b>
<b>5. Summary of Findings .....</b>	<b>7</b>
<b>5.1 Data Sources &amp; Quality: .....</b>	<b>8</b>
<b>5.2 Calculation Methodology: .....</b>	<b>9</b>
<b>5.3 Alignment with GHG Protocol .....</b>	<b>10</b>
<b>5.4 Transparency &amp; Documentation.....</b>	<b>10</b>
<b>5.5 AI Model Use &amp; Validation .....</b>	<b>11</b>
<b>6. Recommendations .....</b>	<b>13</b>
<b>7. Conclusion &amp; Certification .....</b>	<b>14</b>
<b>Appendix: Standards Reference .....</b>	<b>15</b>

# 1. Introduction

This Independent Assessment (IA) has been conducted by Globus Thenken as part of a consulting and assurance engagement with DitchCarbon, a climate-tech platform that provides emissions intelligence to help organizations manage and reduce their carbon footprints.

The primary objective of this assessment is to evaluate and validate the methodology used by DitchCarbon in the computation of industry-specific emission factors, with a particular focus on its application to spend-based Scope 3 emissions. The review assesses the technical soundness, transparency, and alignment of the methodology with globally recognized greenhouse gas (GHG) accounting frameworks.

Given that industry emission factors are a foundational input for estimating indirect emissions — particularly in the absence of supplier-specific data — the integrity and defensibility of this methodology are essential to ensuring credibility in corporate sustainability reporting, supply chain analysis, and auditor assurance processes. This assessment, therefore, plays a critical role in affirming DitchCarbon’s readiness to support enterprise-level GHG disclosures.

## 2. Scope of Assessment

This Independent Assessment covers both qualitative and quantitative components of DitchCarbon's methodology and toolchain. Specifically, the scope includes:

### 2.1 Methodological Review:

Detailed analysis of DitchCarbon's internal methodology for deriving industry emission factors (EFs), including disaggregation of electricity-related emissions, inflation adjustment procedures, and regional alignment.

### 2.2 Standards Benchmarking:

Evaluation of the methodology's alignment with globally accepted emissions accounting frameworks, including the GHG Protocol Corporate Value Chain (Scope 3) Standard, [ISO 14064-1:2018](#) <sup>(1)</sup>, and relevant guidelines from the Intergovernmental Panel on Climate Change (IPCC).

### 2.3 Data and Assumption Validation:

Assessment of the data sources utilized (e.g., [DEFRA](#) <sup>(2)</sup>, [EPA](#) <sup>(3)</sup>, [EXIOBASE](#) <sup>(4)</sup>), the logic used for transforming EEIO datasets into usable emission factors, and the assumptions underpinning fuel type allocation, pricing, and regionalization.

### 2.4 AI-Driven Classification and Matching Logic:

Review of the role of artificial intelligence in matching user inputs (e.g., industry name, region) to emission factor databases, including QA protocols and override capabilities.

### 2.5 Traceability and Auditability:

Verification of whether the methodology maintains traceable data lineage and version control that would support external audit or assurance activities.

### 2.6 Applicability to Scope 3 Emissions:

Consideration of the methodology's suitability for integration into upstream and potentially downstream Scope 3 categories, with emphasis on Category 1 (Purchased Goods and Services) and Category 3 (Fuel- and Energy-Related Activities).

### 3. Objectives

The objectives of this Independent Assessment are as follows:

- To validate the technical robustness of DitchCarbon’s methodology for computing industry emission factors, including the underlying data models, transformation logic, and unit conversions.
- To assess compliance and alignment with recognized global standards and protocols for greenhouse gas accounting, ensuring the methodology can support corporate disclosure requirements under frameworks such as the GHG Protocol and [ISO 14064-1:2018<sup>\(1\)</sup>](#)
- To identify areas of improvement, such as gaps in documentation, data sourcing inconsistencies, or methodological transparency, which could strengthen audit readiness and scalability.
- To issue an Independent Assessment Certification, affirming that, based on the review conducted, DitchCarbon’s current approach is suitable for enterprise Scope 3 emissions estimation and can withstand external scrutiny when properly implemented.

## 4. Methodology of Assessment

The independent assessment of DitchCarbon's emission factor methodology was conducted using a multi-layered approach, combining technical verification, standards alignment, and methodological evaluation. The following core activities were undertaken:

### 4.1 Documentation Review:

We conducted a comprehensive review of the documentation provided by DitchCarbon, including internal methodology papers, emission factor computation frameworks, transformation logic for third-party databases (e.g., [DEFRA](#) <sup>(2)</sup>, [EPA](#) <sup>(3)</sup>, [EXIOBASE](#) <sup>(4)</sup>, [DENSTORE](#)), and AI-driven classification models. This review was aimed at assessing the transparency, completeness, and internal consistency of DitchCarbon's emissions estimation processes.

### 4.2 Stakeholder Discussions:

Structured discussions were held with DitchCarbon's product, sustainability, and data science teams to gain insights into the practical implementation of the methodology. These conversations covered the logic behind data mapping, fallback hierarchies, enrichment techniques, and exception handling, particularly in areas where supplier-specific data was unavailable or substituted with EEIO estimates.

### 4.3 Technical Evaluation of Calculation Methodology:

We selected representative samples across industry and regional categories to verify the mathematical integrity of emission factor transformations and recalculated outputs to confirm alignment with DitchCarbon's reported values. This included assessing the handling of inflation adjustments, currency conversions, and regional grid intensity scaling factors.

### 4.4 Standards and Protocol Mapping:

DitchCarbon's methodology was mapped against globally recognized emissions accounting frameworks to assess conformance and auditability. Specifically, we benchmarked the approach against:

- [GHG Protocol](#) <sup>(5)</sup> Scope 3 Accounting and Reporting Standard – for category definitions and reporting structure
- [ISO 14064-1:2018](#) <sup>(1)</sup> – for principles of transparency, completeness, and quantification
- [IPCC Guidelines for National GHG Inventories](#) <sup>(6)</sup> – for consistency in emission factor derivation and national-level aggregation logic

#### **4.5 Data Source and Emission Factor Validation:**

We examined the provenance, update frequency, and transformation logic of the emission factor databases used within the platform. Particular attention was paid to the integrity of data from EPA<sup>(3)</sup> and EXIOBASE<sup>(4)</sup>, including a review of data lineage, granularity (e.g., annual vs. spot data), and regional applicability. Where discrepancies or deviations were identified, we assessed their impact on emissions estimation and the corrective actions taken.

## 5. Summary of Findings

Area Reviewed	Observation / Comments	Compliance Status	Assessment Notes
Data Sources & Quality	Our review indicates that DitchCarbon utilizes data sources validated and approved by the <a href="#">GHG Protocol</a> <sup>(5)</sup> . The reported figures are well-aligned with the cited references, indicating strong data credibility and adherence to recognized emissions accounting standards.	Compliant	Completed data-lineage audit; verified metadata completeness and alignment with <a href="#">EXIOBASE</a> <sup>(4)</sup> and <a href="#">EPA</a> <sup>(3)</sup> references.
Calculation Methodology	Our initial review indicates that the emission factor calculations are accurate. DitchCarbon’s methodology primarily addresses Scope 3.1 and 3.2 emissions using a spend-based approach. Our verification and recalculation have confirmed that this methodology is appropriate and appears to be correctly applied.	Compliant	Performed sample recalculations on 10% of entries; all deviations fell within the established ±1% tolerance threshold.
Alignment with GHG Protocol	DitchCarbon’s methodology appears to be aligned with the <a href="#">Greenhouse Gas (GHG) Protocol</a> <sup>(5)</sup> , particularly in its application to Scope 3.1 and 3.2 emissions through a spend-based approach. This alignment suggests adherence to established standards for emissions accounting and reporting.	Compliant	Benchmarked process against GHG Protocol scope definitions; no gaps or inconsistencies detected.
Transparency & Documentation	DitchCarbon uses a spend-based approach for calculating Scope 3 emissions, aligned with the <a href="#">GHG Protocol</a> <sup>(5)</sup> , relying on trusted data sources like <a href="#">EXIOBASE</a> <sup>(4)</sup> and <a href="#">EPA</a> <sup>(3)</sup> . The methodology incorporates regional adjustments for grid intensity, inflation, and currency fluctuations to ensure accuracy. Client inputs are classified using a hybrid AI and human oversight system, with final reviews ensuring data consistency. Retroactive adjustments are applied to maintain accuracy across past and future data. The approach is transparent, standardized, and dependable.	Compliant	Reviewed version-control logs and change history; verified that all retroactive adjustments are fully documented and traceable.

[Table 1 – Summary of Findings]

Area Reviewed	Observation / Comments	Compliance Status	Assessment Notes
AI Model Use & Validation	Based on our discussions, DitchCarbon employs a hybrid approach that combines AI-driven classification with human quality assurance to map client inputs to industry categories. An LLM (Large Language Model) performs the initial mapping and assigns a confidence rating (High/Medium/Low). These mappings are reviewed weekly by a QA team, which has the authority to override AI-generated assignments—changes that are applied both retroactively and prospectively. Additionally, the QA team reviews all classifications before the delivery of customer outputs to ensure accuracy. We have completed this assessment to evaluate the reliability of both the data-matching logic and the associated emission factor assignments.	Compliant	Walkthrough confirmed that the LLM applies High/Medium/Low confidence tags to classifications, and that a QA team performs weekly reviews with override authority (retroactive and prospective) and conducts a final review of all mappings before delivery.

[Table 1 – Summary of Findings]

### 5.1 Data Sources & Quality:

As part of our review process, we confirmed the accuracy of DitchCarbon’s figures, calculations, and the reliability of their underlying data sources. To ensure the integrity of the broader dataset, we cross-checked multiple independent sources and examined the reference documentation provided by DitchCarbon, including datasets from the EPA<sup>(3)</sup> and EXIOBASE<sup>(4)</sup>.

For inflation adjustments, DitchCarbon uses the U.S. Bureau of Labor Statistics (BLS) calculator<sup>(7)</sup>. For grid intensity values, DitchCarbon references data from grid intensity datasets. These are all credible and transparent sources that provide a strong foundation for emissions estimation.

In our review of the Emission Factor calculation methodology, we noted some differences between DitchCarbon’s grid intensity values and those published in public datasets. These were primarily related to the use of daily spot grid intensity data, which provides greater temporal granularity but can differ from annual averages used in benchmarks.

We appreciate DitchCarbon’s initiative-taking engagement in addressing our observations. Following our discussion, they promptly refined their methodology and updated their data inputs. The revised figures now align more closely with publicly available sources, further strengthening the overall accuracy and transparency of the platform.

Beyond this, we found the broader dataset to be robust, with no other material inconsistencies noted.

## 5.2 Calculation Methodology:

As part of our review, we assessed DitchCarbon’s emissions calculation methodology and performed sample recalculations to evaluate the consistency of its outputs. The methodology reflects a structured and transparent approach aligned with recognized standards. The following is the methodology followed by DitchCarbon for calculating emission factors: -

The base emission factor is sourced from the U.S. Environmental Protection Agency (EPA <sup>(3)</sup>).

This emission factor is proportionally allocated between:

- Grid-based contributions and non-grid-based contributions, based on the respective energy source shares.

For the grid-based portion:

- An intensity adjustment is applied. This aligns the grid emission intensity of the target country with that of the U.S., ensuring cross-regional comparability.
- After adjustment, the intensity-adjusted grid emission factor is combined with the non-grid emission factor.

The result is the final emission factor, excluding the effects of inflation. Finally, this value is inflation-adjusted from the base year to the applicable/ desired calculation year to reflect changes over time.

Below is a sample emission factor calculation for the Post and Telecommunication industry for the year 2024.

Base EF of 2022 - Post and Telecommunication		kgCO <sub>2</sub> e/USD	0.074	
Emission Source			From Grid	Not from Grid
<b>Grid Contribution</b>			<b>32%</b>	<b>68%</b>
EF affected by grid			0.0236	
EF not affected by grid				0.0504
<b>Grid intensity adjustment</b>				
United States	gCO <sub>2</sub> eq/kWh		400	
Russia	gCO <sub>2</sub> eq/kWh		367	
<b>Intensity Adjustment</b>			0.9175	
EF after Grid Intensity Adjustment	kgCO <sub>2</sub> e/USD		0.0216	
Final Emission Factor	kgCO <sub>2</sub> e/USD		0.0216	0.0504
<b>Total EF before Inflation Adjustment</b>	<b>kgCO<sub>2</sub>e/USD</b>		<b>0.0721</b>	
<b>Inflation 2022 to 2024</b>			<b>1.1</b>	
<b>EF after Inflation Adjustment</b>	<b>kgCO<sub>2</sub>e/USD</b>		<b>0.0655</b>	

[Table 2 – Emission Factor Calculation]

### 5.3 Alignment with GHG Protocol

DitchCarbon's emissions calculation methodology is closely aligned with the [Greenhouse Gas \(GHG\) Protocol](#) <sup>(5)</sup>, specifically in its approach to Scope 3 emissions, including Scope 3.1 (purchased goods and services) and Scope 3.2 (capital goods). In cases where primary, activity-based data is unavailable, the [GHG Protocol](#) <sup>(5)</sup> recommends using a spend-based approach. DitchCarbon applies this approach by estimating emissions based on the amount of money spent on goods, services, and capital goods, which provides a practical and scalable solution for emissions calculation.

The spend-based methodology is particularly valuable for value chain analysis, as it helps estimate emissions in the absence of direct activity data. By using a unit of monetary spend as a proxy for emissions, DitchCarbon ensures that emissions calculations are not only scalable but also comparable across different industries and regions. This approach aligns with the GHG Protocol's guidelines, which support the use of spend-based emissions estimates when direct data is unavailable or difficult to obtain.

Moreover, DitchCarbon's methodology enhances the accuracy of emissions estimates by adjusting for regional carbon intensity and considering inflation and currency conversion factors. These adjustments allow the methodology to better reflect local conditions and economic fluctuations, ensuring that the final emission factors are accurate and relevant for each reporting period. In this way, DitchCarbon's methodology adheres to the GHG Protocol's emphasis on producing consistent, accurate, and transparent emissions data.

### 5.4 Transparency & Documentation

DitchCarbon's emissions calculation methodology follows a spend-based approach to account for Scope 3 emissions, specifically Scope 3.1 (purchased goods and services) and Scope 3.2 (capital goods). This approach is aligned with the [GHG Protocol](#) <sup>(5)</sup>, leveraging trusted data sources such as [DEFRA](#) <sup>(2)</sup>, [EXIOBASE](#) <sup>(4)</sup>, and [EPA](#) <sup>(3)</sup> for emission factors. The methodology incorporates regional adjustments based on local grid intensity, inflation, and currency fluctuations to ensure the calculations reflect accurate, up-to-date emissions. Emission factors are separated into grid electricity and other sources, with adjustments made to account for differences in carbon intensity between regions, ensuring the calculations are tailored to specific countries and jurisdictions.

DitchCarbon utilizes a hybrid methodology for classifying client inputs into industry categories, combining AI-powered automation and human quality assurance (QA). A Large Language Model (LLM) classifies data, assigning confidence levels to each mapping, while a dedicated QA team reviews and overrides AI-generated classifications as needed. This ensures accuracy and consistency across both historical and future data, with all classifications undergoing a final

review before delivery to clients. The process is transparent and systematic, with retroactive adjustments applied to past data when necessary. While internal verification processes ensure the reliability of the results, third-party audits could further strengthen the credibility of the methodology.

Overall, DitchCarbon's approach is grounded in established standards, with a focus on accuracy and transparency in emissions reporting. The methodology ensures that emissions data is consistent, regionally tailored, and aligned with industry's best practices, with room for improvement through external audits and dynamic grid intensity adjustments.

### **5.5 AI Model Use & Validation**

DitchCarbon utilizes a hybrid methodology to classify client inputs into appropriate industry categories, combining AI-powered automation with human quality assurance. Specifically, a Large Language Model (LLM) performs the initial classification and assigns a confidence level (High, Medium, or Low) to each mapping. These classifications are reviewed every week by a dedicated QA team, which has the authority to override AI-generated outputs. Any changes made by the QA team are applied both retroactively to past data and prospectively to future inputs. Furthermore, all classifications undergo final review before the delivery of outputs to clients, adding a layer of quality control.

## Summary: DitchCarbon’s Emission Factor Alignment with Scope 3 Standards

Standard Element	Assessment	Review Notes
<b>Spend-based EF method</b>	Aligned	The spend-based emission factor method used by DitchCarbon is fully aligned with the <a href="#">GHG Protocol<sup>(5)</sup></a> , offering a valid and recognized approach for emissions estimation based on financial data.
<b>Supplier-specific data as priority</b>	Aligned	Supplier-specific emissions data is prioritized and integrated wherever available, ensuring higher data accuracy and alignment with Scope 3 standards.
<b>Category 1 focus (Purchased Goods &amp; Services)</b>	Appropriate	A strong focus on Category 1 is maintained, aligning with its significance as the most material Scope 3 category for many organizations.
<b>Multi-database EF sourcing</b>	Allowed	Emission factors are sourced from multiple databases with comprehensive and clearly documented coverage, ensuring robust and flexible emissions reporting.
<b>AI matching logic</b>	Appropriate	AI-driven matching is supported by well-defined accuracy thresholds and a documented override policy, ensuring both efficiency and control in assigning emission factors.
<b>Reporting requirements</b>	Appropriate	Emission factor versions and methodologies are clearly defined, categorized, and version-controlled, supporting consistent, traceable, and reliable reporting.

[Table 3 – Emission Factor Alignment]

## 6. Recommendations

- DitchCarbon’s emissions estimation methodology demonstrates broad alignment with the [GHG Protocol](#)<sup>(5)</sup>, leveraging reputable data sources such as [DEFRA](#)<sup>(2)</sup> and [EXIOBASE](#)<sup>(4)</sup>. Their approach to adjusting emission factors for regional grid intensity, inflation, and currency ensures that outputs are both geographically and temporally relevant. The use of standardized databases and structured calculations supports methodological consistency, while their hybrid AI–human QA model offers a strong layer of review.
- Supporting documentation is well-organized, and key processes—such as EF adjustments for grid electricity and economic changes—are clearly defined. These practices contribute to the credibility and traceability of DitchCarbon’s outputs.  
To further enhance the accuracy, consistency, and verifiability of its emissions estimates, we recommend transitioning from daily spot grid intensity values to standardized annual averages sourced from publicly available datasets (e.g., national energy agencies). Annual averages offer a more stable and representative basis for emissions calculations and facilitate easier third-party verification.
- We also recommend maintaining more detailed and robust documentation around grid intensity data. This includes clearly specifying data sources and methodologies, timestamping when spot values are used, outlining any normalization processes, and archiving original data inputs. These enhancements would meaningfully improve transparency, data traceability, and the replicability of results.
- On quality assurance, DitchCarbon maintains audit trails for all overrides and sign-offs, supported by documented criteria, enhancing traceability within its AI–human review framework. Publishing summary QA metrics (e.g., override rates by confidence level) in client reports further reinforces DitchCarbon’s commitment to transparency, objectivity, and continuous improvement.

## 7. Conclusion & Certification

Based on the documentation reviewed, stakeholder engagements, and technical evaluations performed, we conclude that:


DitchCarbon's Industry Emission Factor Computational Methodology is **Compliant** with applicable international standards and best practices, including the GHG Protocol Scope 3 Guidance, [ISO 14064-1:2018<sup>\(1\)</sup>](#), and general principles drawn from the IPCC Guidelines for national inventory methods.

The methodology used by DitchCarbon demonstrates a robust framework for estimating Scope 3 upstream emissions, incorporating credible data sources, a clearly defined fallback hierarchy, and thoughtful region-specific adjustments. Notably, DitchCarbon's recent refinements reflect a commitment to transparency and continuous improvement.

Accordingly, we issue our Independent Assessment Sign-Off for the current version of DitchCarbon's computational methodology as of **August 1<sup>st</sup>, 2025**. This sign-off affirms that the reviewed components of the methodology are suitable for use in enterprise climate reporting workflows and align with the expectations of external auditors, clients, and stakeholders seeking credible, standards-aligned emissions data.

We recommend periodic revalidation of emission factor inputs and ongoing documentation updates as DitchCarbon evolves its platform to maintain conformance with emerging standards and ensure continued stakeholder confidence.

Signed by:

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Director

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## Appendix: Standards Reference

Reference Name	Version/Date	Link
ISO 14064-1:2018 <sup>(1)</sup>	2018	<a href="https://www.iso.org/standard/66453.html">https://www.iso.org/standard/66453.html</a>
DEFRA <sup>(2)</sup>	2024	<a href="https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024">https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2024</a>
EPA <sup>(3)</sup>	2025	<a href="https://www.epa.gov/climateleadership/ghg-emission-factors-hub">https://www.epa.gov/climateleadership/ghg-emission-factors-hub</a>
EXIOBASE <sup>(4)</sup>	v_3.8.2	<a href="https://www.exiobase.eu/">https://www.exiobase.eu/</a>
Greenhouse Gas (GHG) Protocol <sup>(5)</sup>	2025	<a href="https://ghgprotocol.org/corporate-value-chain-scope-3-standard">https://ghgprotocol.org/corporate-value-chain-scope-3-standard</a>
IPCC Guidelines for National GHG Inventories <sup>(6)</sup>	2025	<a href="https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html">https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html</a>
U.S. Bureau of Labor Statistics (BLS) <sup>(7)</sup>	2025	<a href="https://www.bls.gov/data/inflation_calculator.htm">https://www.bls.gov/data/inflation_calculator.htm</a>

[Table 4 – Standard Reference]