CASSAVA TECHNOLOGIES

Liquid Intelligent Technologies UK Carbon Footprint Report

Prepared by Promethium Carbon

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PROMETHIUM CARBON

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Table of Contents

List of Tables

Document Control

Date	Amendment	Amendment Number
8 May 2024	First draft submission for external review	1
21 May 2024	Final updates on format and content	2

1. Introduction

This report is an assessment of Liquid Intelligent Technologies' (Liquid) greenhouse gas (GHG) inventory for the financial year 2024 (FY24), specifically focusing on its operations within the United Kingdom. Liquid, a division of the Cassava Group, operated within the reporting period of 1st March 2023 to 29th February 2024 for FY24.

The objective of this report is to compile a GHG emissions inventory for Cassava's Liquid UK division, tailored to meet corporate reporting standards. This inventory encompasses both direct emissions, such as those from fuel combustion, and indirect emissions, including those from purchased electricity and business travel.

The intended audience of this report includes company executives, shareholders, and other relevant stakeholders. This report serves as a tool for understanding and managing Cassava's environmental impact on climate change. By providing transparent data stakeholders can make informed decisions to drive sustainable practices within the organisation and to inform investments.

Promethium Carbon (an independent specialist group) has been appointed to calculate Cassava's GHG inventory. While no verification or assurance of the data sources or results has been conducted by a third party, efforts have been made to ensure data accuracy, integrity and completeness. This was done by conducting sense checks on the data collected, by comparing the FY24 data to the FY23 data to identify possible anomalies correlation with industry trends. In addition, data sources such as invoices, lease contracts and financial statements were also checked as a method of verifying data.

In Cassava's GHG inventory, it's important to address the impact of the UK offices. The Liquid UK division maintains the same scope in their GHG inventory as the Cassava Group and falls under Cassava's relevance criteria.

The UK offices underwent a relocation within the same building in September 2023, transitioning to different floors, reducing floor space from 1 166.7 m^2 to 914.6 m^2. Additionally, the headcount increased from 74 in FY23 to 76 in FY24.

FY24 marks a milestone as the baseline year for setting group-wide sustainability targets. This commitment underscores the Cassava Group's dedication to environmental stewardship and aligns with global efforts to mitigate climate change. The same applies to the scope of this report. The carbon footprint data will serve as the baseline for future UK carbon emissions reporting.

2. Background

Cassava has expanded since the last carbon footprint assessment to include additional divisions and expanded its reach globally. However, as stated, this report only focuses on the Liquid UK operations. For the compressive Cassava Carbon Footprint Report for FY24 refer to https://liquid.tech/about-us/sustainability/

Liquid is a leading provider of digital infrastructure in Africa. Its fibre broadband network and satellite connectivity delivers high-speed internet access anywhere on the continent. Subsidiaries of the Liquid Group leverage Liquid's digital network and their partnerships with leading global players to provide specialised and customised digital and telecommunication solutions in Africa and beyond. Liquid also offers managed cloud and cyber security professional and advisory services and solutions as well as wholesale connectivity solutions, commercialising our pan-African fibre network, subsea cable network and global satellite connectivity.

The site details of the UK operations are shown in ***Table 1*** below.

Table 1: UK Site Details

No	Site ID	Site Type	Area [m^2]	Power Supplier
1	Liquid Telecom London Office	Office	831.6	Land Securities
2	Telehouse North, Suite H1	Commercial Data Centre	20	Telehouse
3	Telecity/Equinix	Commercial Data Centre	22	Equinix
4	Global Switch	Commercial Data Centre	1	Global Switch
5	Brookmans Park	Commercial Data Centre	40	Arqiva
Total			**914.6**	

3. Approach and Methodology

The Liquid UK GHG inventory for FY24 was undertaken and compiled in accordance and consideration of the following standards:

- The Greenhouse Gas Protocol Corporate Standard (GHG Protocol[1]) as developed by the World Business Council for Sustainable Development and the World Resources Institute.
- The ISO 14064-1, 2nd edition. The ISO standard for measuring and reporting GHG emissions, ISO 14064-1:2006, was revised by the ISO in 2018 and a new edition, ISO 14064-1:2018[2], was released and used in this report.

By using these internationally recognised standards in a complementary way, the GHG inventory's environmental integrity is enhanced, corporate risk management is supported, and the development of a GHG management strategy is facilitated. In the FY24 report the focus will be mainly on the GHG Protocol**.** The GHG Protocol's principles for the accounting of this GHG inventory are detailed in ***Table 2.***

Table 2: Principles for GHG accounting and reporting

Principle	Description
Relevance	Ensure the GHG inventory appropriately reflects the GHG emissions of Cassava and serves the decision-making needs of both internal and external stakeholders.

[1] World Business Council for Sustainable Development & World Resources Institute. The Greenhouse Gas Protocol. 2004. [Available Online]: ghg-protocol-revised.pdf (ghgprotocol.org).

[2] International Organization for Standardization. 2018. *Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.* [Available Online]: ISO 14064-1:2018 - Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

Principle	Description
Completeness	The GHG inventory accounts for all significant GHG emission sources within Cassava chosen inventory boundary.
Consistency	Utilise consistent methodologies to enable meaningful comparisons of emissions over time within Cassava.
Transparency	Address all relevant issues in a factual and coherent manner, based on a clear audit trail specific to Cassava. Disclose any relevant assumptions and provide appropriate references to the accounting and calculation methodologies as well as data sources used.
Accuracy	Ensure that the quantification of GHG emissions for Cassava is systematically neither overestimated nor underestimated to the best of our judgment, while reducing uncertainties as far as practicable.

The first step in the quantification of a GHG inventory is the selection of reporting boundaries. These boundaries are important as they identify the GHG emission sources (activities that emit GHGs) that are to be included in the inventory calculation. Two types of GHG inventory boundaries need to be set – an organisational boundary and an operational boundary.

3.1. Organisational Boundary

The organisational boundary refers to a grouping of activities or facilities over which an organisation exercises operational or financial control. It determines which facilities or operations are included in the organisation's GHG inventory for reporting purposes. Two approaches can be used to set the organisational boundary: the control approach and the equity share approach.

Under the control approach, a company accounts for 100% of the GHG emissions from facilities or operations that it has direct control over. This approach considers both financial control and operational control. Financial control is established when a company has the authority to direct the financial and operating policies of an operation, allowing them to gain economic benefits from it. Operational control, on the other hand, is determined by the company's full authority to introduce and implement operating policies at an operation.

The equity share approach, in contrast, considers a company's GHG emissions based on its share of equity in an operation. In this approach, the company accounts for its proportionate emissions based on its ownership stake in the operation.

By establishing the organisational boundary, organisations can accurately determine which facilities or operations to include in their GHG inventory. This ensures the comprehensive reporting of emissions for the purposes of measuring and managing the organisation's carbon footprint and implementing effective emission reduction strategies.

Cassava Group and therefore Liquid has adopted an operational control approach for determining the organisational boundary for their GHG reporting. This means that Cassava accounts for GHG emissions from all facilities over which they have full authority to introduce and implement operating policies. However, for the purpose of this report, the focus is solely on the emissions from Liquid UK’s division operations. Therefore, the emissions reported in this document pertain specifically to Liquid's activities

and operations within the United Kingdom. It is important to note that while this report provides insights into the UK operation's emissions, it represents a subset of Cassava's overall GHG inventory.

3.2. Data and Emission Sources

The inputs, resources, and activities associated with Liquid UK's operations have GHG emission-related impacts. It is crucial to identify the relevant activity data sets to calculate the company's carbon footprint for FY24.

The activity data sets used for the carbon footprint calculations were provided by Liquid UK and included in the GHG inventory calculations for FY24. The following data sets were considered in the carbon footprint calculations:

- Indirect GHG emissions from purchased electricity consumed by Liquid UK facilities.
- Indirect emissions associated with employee commuting of the UK operations' employees.
- Emissions from business travel activities, including flights, car rentals, train journeys, and accommodation of the UK operations' employees.
- Indirect emissions from the disposal and treatment of waste generated by within the UK operations.
- Indirect emissions associated with water consumption, considering the energy required for water treatment and distribution within the UK operations.
- Emissions from other ancillary activities or operations identified as significant contributors to Liquid UK's carbon footprint.
- The emissions associated with purchased goods and services by the Liquid UK operations.

3.3. Relevance criteria

In FY23 the GHG inventory report made use of the significance criteria recommended by ISO 14064-1:2018 for indirect emissions. The GHG Protocol recommends an equivalent set of relevance criteria to asses emissions in terms of their relevance, considering the impact on the carbon footprint.

Companies are responsible for establishing their own criteria to determine the relevance of their indirect emissions, taking into consideration the purpose of the GHG inventory. This assessment serves as a guideline for future carbon footprint reporting by Cassava, ensuring that the identified emission sources are appropriately addressed.

The relevance assessment, outlined in ***Table 3,*** ensures that the carbon footprint boundary includes emission sources that are considered relevant. The outcomes of the relevance assessment are contained in ***Table 4***.

Table 3: GHG Protocol relevance criteria

Criteria	Description
1. Size	**Relevant if** they contribute significantly to the company's total anticipated Scope 3 emissions.
2. Influence	**Relevant if** the emission source can be influenced by the company.

Criteria	Description
3. Risk	**Relevant if** they contribute to the company's climate related risk exposure.
4. Stakeholders	**Relevant if** they are deemed critical by key stakeholders
5. Outsourcing	**Relevant if** they are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting companies' sector
6. Sector Guidance	**Relevant if** they have been deemed significant by sector-specific guidance.
7. Other	**Relevant if** they meet any additional criteria for determining relevance developed by the company or industry sector. In Cassava's case employee engagement has been deemed as additional criteria for determining relevance.

By employing these relevance criteria, Liquid UK ensure a comprehensive evaluation of its indirect emissions, focusing on emission sources that have the most relevant impact on its carbon footprint. This approach enables Liquid UK to prioritise its reporting and mitigation efforts, align with industry standards, and engage stakeholders effectively.

Table 4 outlines the framework used to assess the relevance of emissions sources and determine the inclusions in Cassava's and therefore Liquid UK's GHG inventory based on recommended thresholds.

Table 4: **Relevance criteria and threshold for inclusion**

Criteria	Threshold
1. Size	**Relevant if** emissions account for 1% or more of Liquid UK's total carbon footprint are considered quantitatively substantial and relevant.
2. Influence	**Relevant if** Liquid UK has control of emission sources and can implement measures to monitor and reduce the emissions associated with these activities.
3. Risk	**Relevant if** indirect emissions contribute to Liquid UK's exposure to relevant climate-related risks. This could include emissions associated with activities that contribute to at least one of the following: increase in regulatory risk or increase in supply chain risk.
4. Stakeholders	**Relevant if** there are sector-specific guidance, benchmarks or targets for indirect emissions that are relevant to Liquid UK.
5. Outsourcing	**Relevant if** indirect emissions result from outsourced activities that are core business activities. For example, transportation of products by third-party logistics providers.
6. Sector Guidance	**Relevant if** there are sector-specific guidance, benchmarks or targets for indirect emissions that are relevant to Liquid UK.

Criteria	Threshold
7. Other: Employee engagement	**Relevant if** employees' activities or behaviour (e.g. travel/commuting) result in a significant contribution to Liquid UK's indirect emissions.

The emission sources which have been included in Liquid UK's GHG inventory are detailed in ***Table 5.*** Further details on the significance assessment are contained in ***Appendix 2: Relevance Assessment.***

In accordance with the corporate GHG standards, the emissions from Liquid UK's operations are categorised as either direct or indirect emission sources. The reporting of direct emissions, also known as Scope 1 emissions, as well as energy indirect emissions, known as Scope 2 emissions, is mandatory according to the GHG Protocol and the ISO 14064-1:2018 standard. However, the reporting of other indirect emissions, referred to as Scope 3 emissions, is considered voluntary in the GHG Protocol and is at the discretion of the company of whether to report on these emissions. It is important to note that Cassava's sustainability journey includes setting targets through the Science Based Targets initiative (SBTi), that requires companies to report on all Scope 3 emissions category with the exception of allowing exclusions if there is a valid justification. The GHG Protocol provides guidance in the form of relevance criteria which should be used to determine what indirect emissions sources should be included in the GHG inventory.

The emission sources included in the boundary of this assessment are presented below, categorised according to the respective categories used by the GHG Protocol. These categories align with the different scopes referenced in the GHG Protocol. These emission sources have been carefully evaluated for their relevance and inclusion within Liquid UK's carbon footprint boundary. The assessment ensures transparency, accuracy, and comparability in reporting, allowing for future reference and the establishment of emissions reduction targets.

As Liquid UK continues to develop and mature its carbon footprint calculations, the emission sources and their boundary may evolve. The identification and justification of emission sources are essential components of the formal emissions target setting procedure, providing a foundation for sustainability efforts. ***Table 5*** shows the emission sources and their categorisation using the GHG Protocol.

Appendix 2: Relevance Assessment Appendix 2: Relevance Assessment provides a detailed breakdown and justifications for inclusion or exclusions on the emission sources based on the relevance criteria.

Table 5: Emission sources in Liquid UK's FY24 GHG inventory

GHG Protocol Classification			Emission Source
Scope	**Category**	**Description**	
1		Stationary Combustion Sources Mobile Combustion Sources Fugitive Emissions	Emissions that occur from sources that are controlled or owned by Liquid UK:. None for Liquid UK
2		Purchased Electricity	Emissions associated with the purchasing of electricity, or the generation of renewable energy. Purchased electricity.

3	Category 1	Purchased Goods and Services	Products include both goods (tangible products) and services (intangible products) such as:
			• Water
			• Telecommunication equipment
			  ○ Equipment (Laptops)
			  ○ CCTV camera's
			  ○ Monitors
			• Varius electronic equipment

	Category 2:	Capital Goods	Emissions from the production of capital goods purchased by the company in the reporting year, including: Uninterrupted power supply (UPS)
	Category 3:	Fuel and energy related activities	Emissions related to the production of fuels and energy purchased and consumed by Liquid UK in the reporting year such as: • Upstream emissions of purchased electricity • Transmission and Distribution losses
	Category 5	Waste Generated in Operations	Waste treatment activities may include: • Disposal in a landfill • Recovery for recycling • Food waste
	Category 6	Business travel	Emissions from business travel such as: • Air travel • Rail Travel • Accommodation
	Category 7	Employee Commuting	Emissions from employee commuting such as: • Automobile travel • Rail travel • Motorcycle • Bus travel • Bicycle • Mixed travel (combination of above)

3.4. Calculation Methodology

The methodology used to calculate the GHG inventory entails multiplying the GHG activity data by an appropriate emission factor:

Activity data x Emission Factor = Quantity of GHG Emissions

The total GHG emissions produced by Liquid UK annually are determined by adding up the GHG emissions quantities calculated for each activity data source using the above equation.

3.5. Assumptions, Emissions Factors and Conversion Factors

The calculations of Liquid UK's FY24 GHG inventory rely on a range of assumptions, emission factors, and conversion factors, which have been carefully selected and applied to ensure accuracy and applicability. These factors are provided in the accompanying Excel spreadsheet and are also available in ***Appendix 1: Emissions/ Conversion Factors*** of this report.

The guidance of the GHG Protocol states that if source- or facility's specific emission factors are available, they are preferable to more generic or general emission factors The selection of the emission factors used also follows the guidance provided by the emissions reporting standards, ensuring that they meet the necessary criteria for robust emissions quantification. The factors employed in the calculation process should satisfy the following requirements:

Recognised Source: All factors used originate from reputable and recognised sources within the field of greenhouse gas accounting and reporting.

Appropriate for GHG Sources: Each factor is specifically chosen to be appropriate for the greenhouse gas source being assessed. This ensures that the calculations accurately reflect the emissions associated with each activity.

Up to date factors: The selected factors are up to date as of the time of quantification, considering the most recent available data and scientific knowledge. This ensures that the inventory calculations capture the current understanding of emissions and reflect the latest information.

Consideration of Uncertainty: The chosen factors consider the quantification uncertainty associated with each emission source. They are calculated with methodologies that provide accurate and reproducible results, minimising uncertainties and ensuring the reliability of the inventory.

Alignment with Intended Use: The factors align with the intended use of the GHG inventory, which is to provide a comprehensive and accurate representation of Liquid UK's emissions. They are specifically chosen to suit the purpose of the inventory and facilitate effective decision-making based on the results.

By adhering to these criteria Liquid UK ensures that the calculations of its GHG inventory are based on reliable and relevant information. The transparent inclusion of these assumptions, emission factors, and conversion factors allows for traceability and facilitates the understanding and verification of the reported emissions.

During the calculation of Liquid UK's GHG inventory for FY24, several key assumptions were made to ensure the completeness and accuracy of the emissions assessment. The following assumptions were taken into consideration:

Scope 1 and 2: No assumptions were made as Liquid UK does not have scope 1 emissions, and the scope 2 data did not require assumptions.

Scope 3:

- Municipal water consumption: Estimated using headcount and an average of 32 litres per employee per day for 20 days a month.
- Waste Treatment - Sent to Landfill: Estimated based on data provided.
- Waste Treatment - Paper Waste Recycled: assumes that the weight provided in is kg based on last year's reporting quantity and number of employees in UK office.
- General Waste Recycled and Food Waste to Landfill: Estimated based on data provided.
- Purchased goods and services were categorised, and according to the category an emission factor was applied e.g. The electronics category includes docking stations and computer components.
- Employee commuting: majority of full-time employees (FTE) completed the commuting survey. The computing data was then extrapolated to include an estimate on all FTE commuting habits.

These assumptions were made to ensure a reasonable estimation of GHG emissions in cases where direct data was unavailable or incomplete. It is important to note that these assumptions were based on available information and industry best practices. As more accurate or specific data becomes available, these assumptions can be refined in future reporting cycles to further improve the accuracy and reliability of Liquid UK's GHG inventory calculations.

The calculation of GHG emissions for Liquid UK's carbon footprint relied on the use of reliable and up-to-date emission factors obtained from various trusted sources. The UK Department of Environment Food and Rural Affairs (DEFRA) played a significant role as a primary source for emission factors related to Liquid UK's activities. DEFRA's emission factors are widely recognised and accepted within the industry, ensuring the reliability and relevance of the data for the UK context.

4. Results for Corporate Reporting

This section provides an overview of the FY24 GHG inventory for Liquid UK, intended for corporate reporting purposes and to develop reductions target as part of the Group's Climate Change Strategy. The inventory has been prepared following the reporting formats outlined in the GHG Protocol.

4.1. Results as per the GHG Protocol

The GHG inventory for Liquid UK's FY23 and FY24 is show in ***Table 6*** and follows the reporting structure outlined by the GHG Protocol. The inventory only covers Scope 2 and 3, as Liquid UK does not have any Scope 1 emissions due to the absence of combustion sources under its operational control or company-owned vehicles.

Table 6: FY24 GHG inventory according to the GHG Protocol

Scope	Description	FY23 Emissions	FY24 Emissions*
Scope 1	Stationary and Mobile Combustion Sources	0 tCO_2e	0 tCO_2e
Total scope 1		**0 tCO_2e**	**0 tCO_2e**
Scope 2	Purchased Electricity	80.03 tCO_2e	77.97 tCO_2e
Total scope 2		**80.03 tCO_2e**	**77.97 tCO_2e**

Scope	Description	FY23 Emissions	FY24 Emissions*
Scope 3	Category 1: Purchased Goods and Services	0.25 tCO_2e	0.51 tCO_2e
	Category 2: Capital Goods	-	0.04 tCO_2e
	Category 3: Fuel- and Energy-related Activities	7.32 tCO_2e	6.75 tCO_2e
	Category 5: Waste Generated in Operations	0.004 tCO_2e	0.36 tCO_2e
	Category 6: Business Travel	1 201.33 tCO_2e	2 082.99 tCO_2e
	Category 7: Employee Commuting	37.07 tCO_2e	168.86 tCO_2e
Total scope 3		**1 245.98 tCO_2e**	**2 259.51 tCO_2e**
Total Emissions		**1 326.02 tCO_2e**	**2 337.48 tCO_2e**

*** FY 24 is Liquid UK's baseline year**

In FY24, Liquid UK's scope 2 emissions amounted to 77.97 tCO_2e, showing a decrease from 80.03 in FY23. This reduction reflects the carbon impact of the purchased electricity used in Liquid UK's operations.

The calculated Scope 3 emissions for FY24 totalled 2 259.51 tCO_2e, a significant increase from 1 245.98 tCO_2e in FY23. This increase is attributed to several factors:

- Capital goods were reported for the first time in FY24 as capital goods is not necessarily purchased each financial year.
- More waste streams were included in FY24, leading to higher emissions.
- Business travel emissions rose due to the availability of more data and increased travel as markets recover after Covid-19.
- Emissions from fuel- and energy-related activities remained consistent with Scope 2 trends.
- Employee commuting emissions increased because of a larger headcount and better participation in the commuting survey.

Among the Scope 3 categories, business travel accounted for the largest portion at 2,082.99 tCO_2e, with employee commuting being the second largest at 168.86 tCO_2e. The total emissions for Liquid UK is 2337.48 tCO_2e.

5. Conclusion and Recommendations

In this section of the FY24 carbon footprint report, valuable insights into the organisation's greenhouse gas emissions are provided. The data collected and analysed in accordance with the GHG Protocol highlights the relevant sources of emissions, offering valuable insights for future carbon footprint reporting and management strategies. The management strategies include using FY24 as a baseline for target setting.

5.1. Conclusions

The total emissions for Liquid UK's FY24 carbon footprint are summarised in ***Table 7***, following the GHG Protocol standards.

Table 7: GHG inventory summary

GHG Inventory according to the GHG Protocol	FY23 Emissions	FY24 Emissions
Scope 1: Direct GHG emissions and removals	0 tCO_2e	0 tCO_2e
Scope 2: Indirect GHG emissions from imported energy	80.03 tCO2e	77.97 tCO_2e
Scope 3: Other indirect emissions that occur in the value chain	1 245.98 tCO2e	2 259.51 tCO_2e
Total emissions	**1 326.02 tCO_2e**	**2 337.48tCO_2e**

The total carbon footprint for FY24 amounts to 2 337.48 tCO_2e, a significant increase from FY 23 at 1 326.02 tCO_2e. This is due to the increase in data collection and reporting as well as additional emission sources added from FY23. The largest contributor is Scope 3 indirect emissions, specifically from the business travel activities, accounting for 2 082.99 tCO_2e. Scope 1 direct emissions, did not contribute to Liquid UK's emissions as they do not have any direct sources of emissions. Scope 2 energy indirect emissions amount to 77.97 tCO2e, which represents the emissions associated with the purchasing of electricity.

Liquid UK's carbon footprint for FY24 reveals important insights into the organisation's emissions sources. Identifying the major emission sources highlighted in this report serves as a foundation for informed decision-making. Having established its first baseline data (FY24), the information can now be used for setting emission reduction targets and developing sustainability strategies. By addressing business travel emissions and expanding monitoring efforts to include all waste streams, Liquid UK can continue its journey towards a more sustainable and environmentally responsible future. The total emissions of 2 337.48 tCO_2e underscore the need for ongoing mitigation measures and the implementation of sustainable practices across various categories.

5.2. Recommendations

The following are general recommendations discussed under two categories, namely emission reduction opportunities and suggestions for improving the quantification of Liquid UK's carbon footprint data to achieve more accurate emissions data.

Emission reduction opportunities:

- *Continued Electricity Monitoring and Reduction Efforts:*
  Liquid UK should continue to monitor its energy consumption closely and identify areas for further reduction such as making use of motion activated office lighting or the use of daylight sensors. Implementing energy-efficient technologies and practices can lead to significant carbon footprint reductions over time.
- *Employee Engagement and Awareness:*
  Encourage employee engagement in sustainability initiatives through awareness campaigns, training programs, and incentives for eco-friendly behaviours. Employees play a crucial role in driving sustainability efforts within the organisation in areas such as business travel and commuting habits.
- *Supply Chain Collaboration:*
  Strengthen collaboration with suppliers to promote sustainable practices throughout the supply chain. This can include sourcing materials from environmentally responsible suppliers and encouraging them to reduce their own carbon emissions.
- *Investment in Renewable Energy:*
  Explore opportunities to invest in renewable energy sources such as solar or wind power to reduce reliance on fossil fuels and further mitigate carbon emissions.

Recommendations for future Liquid UK carbon footprint quantification:

- *Improved Data Monitoring:*
  Implementing improved data monitoring such as waste streams to provide more accurate data and rely less on estimations. Monitoring and reporting of upstream and downstream transportation and distribution activities can also improve and expand on Liquid UK's GHG inventory to include all business-related activities.
- *Reduce Business Travel Activities*:
  Implementation of more sustainable business activities such as conducting business meetings online instead of in person to reduce travel emissions.
- *Transportation and Travel Policies*:
  Review and revise transportation and travel policies to minimise carbon emissions associated with business travel. This may include promoting telecommuting options, encouraging and incentivising the use of public transportation, and supporting carpooling initiatives.
- *Continuous Improvement:*
  Emphasise the importance of continuous improvement in sustainability performance. Regularly assess and update carbon footprint metrics, set ambitious emission reduction targets, and celebrate achievements to maintain momentum in sustainability efforts. Obtaining supplier specific emission factors from suppliers would also help in improving the accuracy of the scope 3 reporting.

Appendix 1: Emissions/ Conversion Factors

Item	Value	Unit	Source
None	-	-	-
UK - GEF	0.21	tCO_2e/MWh	DEFRA GHG conversion factors 2023 - 'UK Electricity' tab
3.1 Purchased Goods and Services			
Water Consumption	0.0002	tCO_2e/kiloliter	DEFRA GHG conversion factors 2023 - 'Water Supply' tab
IT Equipment (Dell)	0.000002	tCO_2e/USD	Calculated by dividing the total scope 1 + 2 emissions of a major computer manufacturer (Dell) by their total revenue to get an estimate emissions per revenue
IT Components (Intel)	0.0000.24	tCO_2e/USD	Calculated by dividing the total scope 1 + 2 emissions of a major computer component manufacturer (Intel) by their total revenue to get an estimate emissions per revenue
Security Systems + CCTV (Logitech)	0.0000003	tCO_2e/USD	logi-fy23-impact-report-final.pdf (logitech.com)
3.3 Fuel and Energy Related Activities			
Transmission & Distribution Losses			
UK - T&D Factor	0.2	tCO_2e/MWh	DEFRA 2023 "Transmission and Distribution" Tab
Well-To-Tank Losses			
WTT Diesel	0.0006	tCO_2e/Litre	DEFRA GHG conversion factors 2023 - 'WTT - fuels' tab - Diesel (100% mineral)
WTT Petrol	0.00060664	tCO_2e/Litre	DEFRA GHG conversion factors 2023 - 'WTT - fuels' tab - Petrol (100% mineral)
3.5 Waste generated in operations			
Waste to Landfill	0.52	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab - Commercial and industrial waste
E-Waste Disposed	0.01	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab
Recyclable Waste	0.02	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab - Assumed Average Plastic Waste
E-Waste Recycled	0.02	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab
Hazardous Waste	0.02	tCO_2e/tonnes	Assumed to be E-waste disposed after Discussion with Liquid
Recycled Mixed Paper	0.02	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab
Waste to Landfill - Food Waste	0.70	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab
Waste to Landfill - Paper Waste	.16	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab
Waste to Landfill - Plastic Waste	0.01	tCO_2e/tonnes	DEFRA GHG conversion factors 2023 - 'Waste Disposal' tab
Waste to Landfill - Mix Paper & Food Waste	0.93	tCO_2e/tonnes	Calculated
3.6 Business Travel			

Item	Value	Unit	Source
Flights			
Domestic UK	0.0003	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Economy to/from UK (Short-haul)	0.0002	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Business to/from UK (Short-haul)	0.0003	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Economy to/from UK (Long-haul)	0.0002	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Premium Economy to/from UK (long-haul)	0.0003	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Business to/from UK (Long-haul)	0.0006	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
First to/from UK (Long-haul)	0.0008	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Economy to/from Non-UK	0.0001	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Premium Economy to/from Non-UK	0.0002	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Business to/from Non-UK	0.0004	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
First to/from Non-UK	0.00005	tCO_2e/km	DEFRA 2023 "Business Travel - Air" tab
Rail			
Rail - Economy Class	0.00001	tCO_2e/km	What is the Co2 emission factor per kilometer when using Eurostar? - Eurostar Help Centre
Rail - Business Premier	0.00001	tCO_2e/km	What is the Co2 emission factor per kilometer when using Eurostar? - Eurostar Help Centre
Rail - First Class	0.00004	tCO_2e/km	DEFRA 2023 "Business Travel - land" & "WTT - pass vehs & travel - land" tab; Assume National Rail
Rail - Standard Class	0.00004	tCO_2e/km	DEFRA 2023 "Business Travel - land" & "WTT - pass vehs & travel - land" tab; Assume National Rail
Accommodation			
United Arab Emirates - Accommodation	0.06	$tCO_2e/night$	DEFRA 2023 “Hotel Stay” Tab
USA - Accommodation	0.02	$tCO_2e/night$	DEFRA 2023 “Hotel Stay” Tab
South Africa - Accommodation	0.13	$tCO_2e/night$	Hotel Footprint Calculator (hotelfootprints.org)
UK - Accommodation	0.01	$tCO_2e/night$	DEFRA 2023 “Hotel Stay” Tab
Mexico - Accommodation	0.02	$tCO_2e/night$	DEFRA 2023 “Hotel Stay” Tab
Kenya - Accommodation	0.04	$tCO_2e/night$	Hotel Footprint Calculator (hotelfootprints.org)
Monaco - Accommodation	0.01	$tCO_2e/night$	Hotel Footprint Calculator (hotelfootprints.org)
Italy - Accommodation	0.01	$tCO_2e/night$	DEFRA 2023 “Hotel Stay” Tab
Malta- Accommodation	0.02	$tCO_2e/night$	Hotel Footprint Calculator (hotelfootprints.org)
Morocco - Accommodation	0.09	$tCO_2e/night$	Hotel Footprint Calculator (hotelfootprints.org)

Item	Value	Unit	Source
Spain - Accommodation	0.01	tCO_2e/night	DEFRA 2023 “Hotel Stay” Tab
Israel - Accommodation	0.05	tCO_2e/night	Hotel Footprint Calculator (hotelfootprints.org)
Ivory Coast - Accommodation	0.04	tCO_2e/night	Hotel Footprint Calculator (hotelfootprints.org)
Netherlands - Accommodation	0.01	tCO_2e/night	DEFRA 2023 “Hotel Stay” Tab
Croatia - Accommodation	0.02	tCO_2e/night	Hotel Footprint Calculator (hotelfootprints.org)
Australia - Accommodation	0.04	tCO_2e/night	DEFRA 2023 “Hotel Stay” Tab
3.7 Employee Commuting			
Employee Commuting - Car (Diesel)	0.00017	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab; Average Diesel Vehicle
Employee Commuting - Car (Petrol)	0.00016	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab; Average Petrol Vehicle
Employee Commuting - Car (Hybrid)	0.00012	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab; Average Hybrid Vehicle
Employee Commuting - Car (Unknown)	0.00017	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab; Average Unknown Vehicle
Employee Commuting - Car, train & walk	0.00007	tCO_2e/km	Calculated
Employee Commuting - Bus	0.00010	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab - Average Bus
Employee Commuting - Mix: Bus and Taxi	0.00016	tCO_2e/km	Calculated
Employee Commuting - Mix: train and bus	0.00007	tCO_2e/km	Calculated
Employee Commuting - Underground	0.00003	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab - Rail London Underground
Employee Commuting - Mix: Train, Bus & Taxi	0.00012	tCO_2e/km	Calculated
Employee Commuting - Mix: Underground, Bus/Taxi	0.00011	tCO_2e/km	Calculated
Employee Commuting - Mix: Car, Train & Walk	0.00007	tCO_2e/km	Calculated
Employee Commuting - Mix: Car & Train	0.00010	tCO_2e/km	Calculated
Employee Commuting - Train	0.00004	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab - Rail National Rail
Employee Commuting - Taxi	0.00021	tCO_2e/km	DEFRA 2023 "Business Travel - Land" Tab - Regular Taxi
Employee Commuting - Motorbike	0.00014	tCO_2e/km	DEFRA Concersion Factors 2023 'Business Travel - Land' & 'WTT - pass Vehs & travel - land' sheet - Average Motorbike
Averaged Consumptions used for Estimates			

Item	Value	Unit	Source
Average warehouse electricity consumption per floorspace	33.0	kWh/m2	Warehousing-and-logistics-guide.pdf (ctprodstorageaccountp.blob.core.windows.net)
Average Office waste sent to landfill	0.74	kg/person/day	https://datatopics.worldbank.org/what-a-waste/trends_in_solid_waste_management.html#:~:text=Worldwide%2C%20waste%20generated%20per%20person%20per%20day%20averages%200.74%20kilogram
Average working days per month	20	Days/months	Assumed
Average Water Consumed in Office per day per employee	32	litre/person/day	Office-Buildings-Water-Efficiency-Guide-EN.pdf (squarespace.com)
Conversions			
US Dollar to Great British Pound	0.80	GBP/USD	1 USD to GBP - US Dollars to British Pounds Exchange Rate (xe.com)

Appendix 2: Relevance Assessment

Source of indirect emissions	Relevance criteria							Recommendation
	Size	Influence	Risk	Stakeholders	Outsourcing	Sector guidance	Other (Employee Engagement)	
Purchase of goods and services – water consumption - Municipal	No- these emissions do not form more than 1% of the overall indirect emissions.	No – Cassava has no level of influence on the purchase of water as it is supplied by a municipality.	Yes- There is a high level of risk if water shortages occur for Cassava's workforce. This risk is higher in countries such as South Africa who experience frequent water shortages.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - water is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector	No - sector guidance does not have a recommendation for this emission source.	Yes – Campaigns to use less water and to reduce water waste can be implemented for Cassava's employees through employee engagement.	This emission source should be included in the inventory because of the risk to Cassava, and employee engagement.
Purchase of goods and services - Purchase of IT equipment	No – these emissions do not form more than 1% of the overall indirect emissions.	Yes -_ Cassava can influence suppliers of IT equipment as there are some possibilities for switching to other suppliers or equipment with a lower emission factor.	Yes- risk of supply chain disruptions from climate change related events such as flooding, can disrupt Cassavas supply chain for the goods that can negatively impact Cassava's business activities.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - IT equipment is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector.	Yes – ICT sector guidance[3] is applicable and recommends that IT equipment and services are included.	No – employees are not responsible for procurement of IT Equipment.	Yes, this emission source should be included based on influence, risk and sector guidance.
Capital Goods - UPS	No – these emissions do not form more than 1% of the overall	Yes - Cassava can influence suppliers of UPS as there are some possibilities for switching to	Yes- risk of supply chain disruptions from climate change related events such as flooding, can disrupt Cassavas supply chain for the	No – Cassava's stakeholders do not specifically require the emission	No - UPS equipment is not an outsourced activity previously performed in-house nor is it an activity that is typically	Yes – ICT sector guidance[4] is applicable and recommends that ICT equipment and	No – employees are not responsible for procurement of IT Equipment.	Yes, capital goods should be included based on influence, risk and sector guidance.

[3] Available at: https://ghgprotocol.org/sites/default/files/2023-03/GHGP-ICTSG%20-%20ALL%20Chapters.pdf
[4] Available at: https://ghgprotocol.org/sites/default/files/2023-03/GHGP-ICTSG%20-%20ALL%20Chapters.pdf

Source of indirect emissions	Relevance criteria							Recommendation
	Size	Influence	Risk	Stakeholders	Outsourcing	Sector guidance	Other (Employee Engagement)	
	indirect emissions.	other suppliers or equipment with a lower emission factor.	UPS that can negatively impact Cassava's business activities.	source to be included in their GHG inventory.	performed in-house by other companies in the ICT sector.	services are included and can influence their business services.		
Fuel- and Energy-related activities – purchased electricity	No – these emissions do not form more than 1% of the overall indirect emissions.	No – Cassava has no level of influence on the purchase of electricity as it is supplied by a utility company.	Yes- risk of supply chain disruptions from climate change related events such as flooding and high wind speeds, can disrupt Cassava's supply chain for electricity supply that can negatively impact Cassava's business activities.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - Electricity is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector.	No - sector guidance does not have a recommendation for this emission source.	Yes – Campaigns to use less electricity can be implemented for Cassava's employees through employee engagement.	Yes, it should be included based on risk and employee engagement.
Waste generated in operation – Waste Sent to Landfill	No – these emissions do not form more than 1% of the overall indirect emissions.	Yes – Cassava has a level of influence on the waste sent to landfill as they can limit the amount sent to landfill and increase recycling practices.	Yes- risk of supply chain disruptions from climate change related events such as flooding, can disrupt Cassava's supply chain for waste sent to landfill that can negatively impact Cassava's employee health.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - waste sent to landfill is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector.	No - sector guidance does not have a recommendation for this emission source.	Yes – Campaigns to use reduce waste sent to landfill and to make use of recycling can be implemented for Cassava's employees through employee engagement.	Yes, waste sent to landfill should be included based on influence, risk and employee engagement.
Waste generated in operation – Waste Recycled	No – these emissions do not form more than 1% of the overall indirect emissions.	Yes – Cassava has a level of influence on the waste recycled as they can influence the way the waste is recycled	No - risk for this emission source is low.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	Yes- some recycling can be done in-house such as separating waste and composting.	No - sector guidance does not have a recommendation for this emission source.	Yes – Campaigns to recycle can be implemented for Cassava's employees through employee engagement.	Yes, waste recycled should be included based on influence, outsourcing and employee engagement.

Source of indirect emissions	Relevance criteria							Recommendation
	Size	Influence	Risk	Stakeholders	Outsourcing	Sector guidance	Other (Employee Engagement)	
Business travel - Flights	Yes – these emissions forms more than 1% of the overall indirect emissions.	Yes – Cassava has a level of influence on the flights as they can choose different suppliers and lower emission flights.	Yes- risk of supply chain disruptions from climate change related events such as extreme weather events that can delay a flight, can disrupt Cassava's business operations.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - Flights is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector.	No - sector guidance does not have a recommendation for this emission source.	No – employees are not responsible for booking flights for business travel.	Yes, flights should be included based on size, influence and risk
Business travel - Rail	No – these emissions do not form more than 1% of the overall indirect emissions.	Yes – Cassava has a level of influence on the rail travel as they can choose different suppliers.	Yes- risk of supply chain disruptions from climate change related events such as extreme weather events that can delay a train route, can disrupt Cassava's business operations.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - Rail travel is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector.	No - sector guidance does not have a recommendation for this emission source.	No – employees are not responsible for booking rail travel for business travel.	Yes, rail travel should be included based on influence and risk.
Business travel - Accommodation	No – these emissions do not form more than 1% of the overall indirect emissions.	Yes – Cassava has a level of influence on accommodation as they can choose different suppliers and accommodation that implements sustainable practices.	Yes- risk of supply chain disruptions from climate change related events such as extreme weather events that can disrupt Cassava's business travel.	No – Cassava's stakeholders do not specifically require the emission source to be included in their GHG inventory.	No - Accommodation is not an outsourced activity previously performed in-house nor is it an activity that is typically performed in-house by other companies in the ICT sector.	No - sector guidance does not have a recommendation for this emission source.	No – employees are not responsible for booking accommodation for business travel.	Yes, accommodation should be included based on influence and risk.
Employee commuting	Yes – these emissions forms more than 1% of the overall	No – Cassava has no level of influence on employee commuting.	Yes- risk change related events such as extreme weather events can disrupt employees	No – Cassava's stakeholders do not specifically	No – employee commuting is not an outsourced activity previously performed in-house	No - sector guidance does not have a recommendation for this	Yes, campaigns can be implemented to encourage carpooling, or	This emission source should be included based on size, risk, and employee engagement.

Source of indirect emissions	Relevance criteria							Recommendation
	Size	Influence	Risk	Stakeholders	Outsourcing	Sector guidance	Other (Employee Engagement)	
	indirect emissions.		commuting to work, putting them in danger.	require the emission source to be included in their GHG inventory.	nor is it an activity that is typically performed in-house by other companies in the ICT	emission source.	arrange for a shuttle service.	