

LOUNGERS

| **Report**

**Task Force on Climate
Related Financial
Disclosure (TCFD)**

Loungers plc

FY2024

1.0 Financial disclosure of climate related risk and opportunity

This is our second Task Force on Climate Related Financial Disclosure (TCFD) report and we are pleased to communicate an even greater focus on environmental social governance and an enhanced risk assessment. The actions put in place and the governance structure have also been assessed in terms of proposed reporting under IFRS S1 and S2 and a gap analysis between the two reporting standards has indicated a good alignment between what we report here and the relatively few additional items that would need to be included under S1 and S2 and as fuller financial disclosure becomes a requirement.

The TCFD is a framework, formed by the Financial Sustainability Board to encourage the uptake of climate risk and opportunity measurement and disclosure in the private sector. In 2017 it outlined guidance through 11 disclosure recommendations regarding governance, strategy, risk management and climate targets. It requires businesses to map risks and opportunities and assign a financial value to enable a carbon emissions strategy that will limit the global warming trajectory to as close to 1.5°C as possible.

The overall structure of TCFD has enabled Loungers to integrate climate related risks and opportunities into its governance review process and to improve the accuracy of the full scope 1-3 carbon reporting analysis of its operations and supply chain that was first reported in 2023.

This report follows the structure of the TCFD guidance in describing our approach in terms of governance, strategy, risk management and metrics and targets.

There is still much uncertainty around the trajectory for global temperature rise, but the consensus is that we will miss our target of a maximum average temperature rise of 1.5C beyond which we start to lose the ability to predict the impact of changes to people, financial prosperity and our planet. This so-called triple bottom line indicates that there are three ways we can influence business success that leads to supply chain prosperity by engaging with people and minimising our impact on the planet. By reporting openly and transparently what our carbon emissions are now and how we see a path to net zero it is our hope that we demonstrate to other businesses that a solution is within grasp and particularly so if we attach financial value to the consequences and rewards of our changing climate.



2.0 Governance

Governance

Organisations are recommended to establish and disclose appropriate internal governance processes for climate-related risks and opportunities.

Disclosure recommendations

- a) Describe the Board's oversight of climate-related risks and opportunities.
- b) Describe management's role in assessing and managing climate-related risks and opportunities

Key Risks and Mitigations in the Loungers business

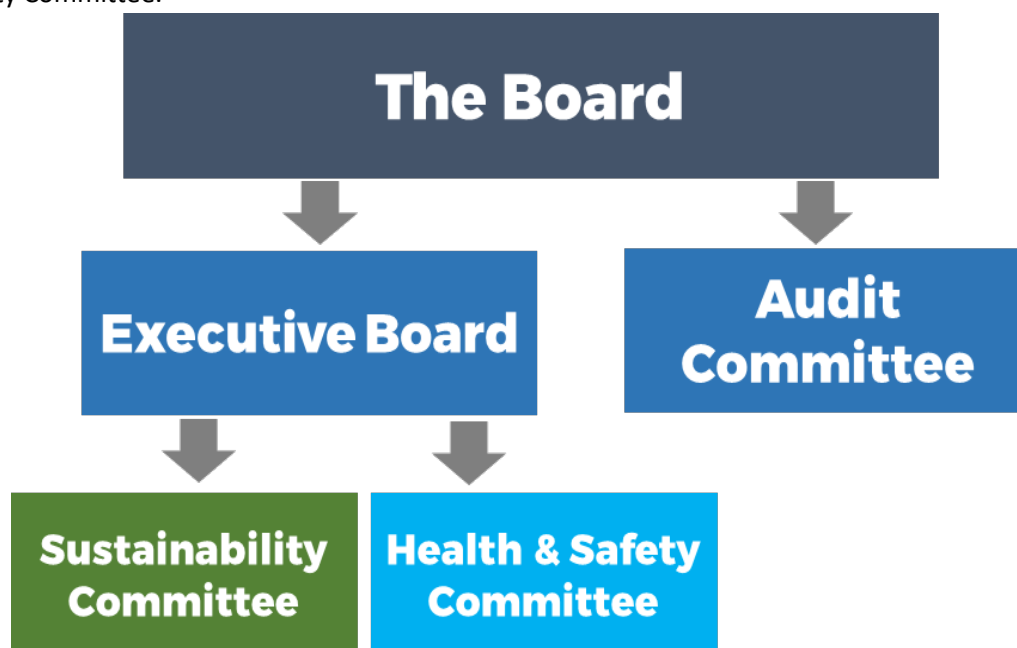
The Board regularly reviews risk and incorporates climate risk into the matrix.

Loungers continues to operate in a competitive environment, where our customers and employees face increasing challenges from the cost of living crisis. Therefore reductions in cost through opportunities created by leading ESG performance and operational efficiency can provide options for cost control and improved brand positioning.

Role of the Board in Identifying and Managing Risk

The Board is responsible for setting the structures and review in place so that risks are identified, considered and appropriate actions are taken to limit any negative impact to Loungers.

The Board delegates oversight of financial risks and opportunities to the Audit Committee and operational risks and opportunities to the Executive Board. The Executive Board is kept informed of key risk and actions through the operation of specific committees, including the Health and Safety Committee and the Sustainability Committee.



Sustainability Committee Terms of Reference

Purpose

- To ensure that Loungers is a "Force for Good" by devising and implementing a Sustainability strategy¹
- To bring together different elements of the Loungers leadership team and ensure that ESG is an integral part of our decision making
- To galvanise action, obtain buy in from senior leadership and ensure that a high visibility group of people are held accountable for delivery
- To own Loungers' climate strategy and risk mitigation plans
- To provide reporting and insight on Loungers' Sustainability initiatives to the Board

Composition

The Sustainability Committee provides oversight and governance on behalf of the Board. The Committee is chaired by Justin Carter, Brand Managing Director², and contains representatives from key functions including Commercial, People, Finance, Compliance, Marketing, and Property as well as an external sustainability expert to challenge our thinking.

Meeting Frequency

- Formal monthly meeting
- Quarterly report to Executive Board and PLC

Scope

- TCFD reporting (governance, strategy, risk management, metrics and targets)
- Operational initiatives (energy usage, waste management, oil usage, fleet policies)
- Purchasing initiatives (energy sourcing, supplier selection, menu selection, food sourcing and distribution, consumables / non-food sourcing)
- Capex projects (sign off, build specifications, carbon reduction investment projects)
- People initiatives (sustainability champions, site level training)
- Review progress against targets
- Agree new areas of opportunity or concern.

Short term Aims (0-3 months)

- Benchmark where we are on sustainability vs our peers
- TCFD review from FY24 to determine key actions for FY25
- What are the three key initiatives that we want to launch and how ?
- How do we engage the wider teams around this?

Output: Summarise strategy, targets and current and proposed initiatives to board

Medium term aims (3-12 months)

- Develop the roadmap for a risk based approach to climate change, appoint external partners
- Set up employee framework for collaboration with wider teams
- Establish reporting format (KPIs) and frequency for Board oversight
- Prepare and review the ESG / TCFD reporting for 2025
- Keep Board advised of any changes to legal / regulatory environment
- Engage with wider Hospitality bodies to drive wider systemic change

Output:

- TCFD compliant for FY25
- Loungers ESG Policy
- Monitoring and reporting framework for initiatives and targets

Long term aims (>12 months)

- Development and implementation of Sustainability Policy
 - Values
 - People
 - Healthy Hospitality
 - Responsible Supply Chain
 - Communities

During the year, external parties have been invited to present certain areas in more detail, including a carbon expert and a Bristol-based social enterprise, which have helped to evolve the way we think about and respond to key issues. We are confident that this structure enables sufficient oversight of key risks and facilitates action to mitigate risk on an ongoing basis.

¹ [The-Good-Stuff-Loungers-Sustainability-Report-2023-.pdf](#)

² Chaired by Guy Youll, Chief People Officer, during 2024

3.0 Strategy

Strategy

It is recommended that organisations disclose the nature and impact of their material climate-related risks and opportunities, as well the resilience of their strategy under each climate scenario chosen.

Disclosure recommendations

- a) Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term.
- b) Describe the impact of climate-related risks and opportunities on the organisation's businesses, strategy and financial planning.
- c) Describe the resilience of the organisation's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario

Loungers strategy is to support long term business growth whilst minimising its impact on the environment and operating in a verifiably ethical and responsible way.

Our strategic position on climate protection in line with our net zero target recognises a number of short, medium and long-term climate-related risks and opportunities to embed the global climate issue in our business and providing support and direction for our suppliers and customers as we all grapple with the complexities of getting to net zero.

The TCFD structured approach to climate risk enable a seamless integration of climate related financial implications to be introduced to existing operations and board risk management.

Net Zero or Carbon Neutral? Net zero is the gold standard chosen by Loungers

Carbon Neutral: a company purchases carbon credits from activities in which external operators have removed CO₂ from the atmosphere and have had these verified as credits usually offered in tonnes CO₂e for others to buy. This does not in fact reduce any of your carbon emissions and is simply a mathematical way to balance out emissions and removals.

Net Zero: this is a status where CO₂ emissions have definitely been reduced and not just balanced out. A net zero strategy can involve becoming lean in terms of efficiency, green in terms of selection of low or zero emission fuels and mean if any activities can be stopped. The latter 'mean' category is exceptionally difficult to find for most businesses. It is also likely that technology does not yet exist for companies to become entirely net zero.

There are many business leaders who have announced net zero targets believing that they can buy carbon credits to get to that position. That would be a carbon neutral target not a net zero target and frankly not relevant in the context of the entire global population and businesses needing to make real reductions in carbon at source not rely on the mitigating actions of others.

There is an international benchmark adopted by just over 8000 businesses globally called a science based target. Around half of these have set net zero targets. This is a voluntary scheme whereby businesses commit to becoming low or zero emitting within a maximum 10 year window starting with a baseline no earlier than 2015. These guidelines on carbon removals have become accepted by the world's leading companies and establish a standard for net zero that requires at least 90% abatement (reduction in emissions) and only up to 10% carbon credits.

The gold standard is to only buy carbon credits once companies have reached net zero through their own endeavours such that purchase of carbon credits then becomes climate positive or carbon negative.

Loungers have set a carbon net zero target for operational (scope 1 and 2) emissions by 2035 and for scope 3 by 2050 and have developed options to reach that target using real emissions reduction not offsetting.

Loungers net zero programme is aligned with the aims of the UK government to switch to electric from natural gas as soon as possible. The electricity network is on track to become net zero by 2035 so this part of the carbon roadmap is perfectly aligned with technological development and the availability of net zero power.

Cost of carbon emissions and route to Net Zero

There are carbon markets where carbon credits can be bought. They fall into two categories: legal and voluntary. The voluntary carbon markets are not always that well-regulated and currently would not be accepted as mitigation for emissions within a legal taxation framework in the UK or Europe. Voluntary credits could come from tree planting or agricultural regenerative farming practices. The use of any credits is still controversial to many in the regulatory sector who fear that allowance of any reduction in apparent carbon footprint could dilute focus on making real and permanent reductions towards net zero.

Loungers plc references the carbon price on the UK Emissions Trading Scheme (UKETS)³.

Loungers plc has a strategy of not being reliant on offsetting.

This protects its strategic aims by removing the potential increased cost of carbon credits predicted by UK government which could see the price of credits soar from the current £80 per tonne to £300 per tonne.

Whilst Loungers' target is not to be carbon neutral, an awareness of the price of carbon is a way to quantify the impact of emissions and be ready for any taxation scheme should it be introduced. This cost is referred to as an **Internal Price of Carbon (IPC)** which is used in assessing capital and operational savings from emissions reduction as an additional financial metric.

Loungers is committed to aligning with the science based target approach to offsetting. This is financially evaluated by reference to the IPC. If the carbon roadmap can be delivered earlier than 2035 then an offsetting policy that makes the group activities climate positive or carbon negative would become an attractive opportunity.

³ [Carbon Price Tracker | Ember \(ember-climate.org\)](#) [Live Carbon Prices Today, Carbon Price Charts · Carbon Credits](#)

Actions in support of Carbon net zero targets

We have engaged with our stakeholders and with industry experts to understand how our actions are impacting on others and the environment and what we can do to make those impacts positive. We have also invited feedback from our teams and held workshops to consider what we can do better.

This year, we have split the “Customers and Community” pillar into two separate focus areas, hence our “Good Stuff” strategy is now organised around five key pillars:

Community:	We exist to bring people together	<p>Target for FY25:</p> <ul style="list-style-type: none"> • Host 10,000 community events per year • Raise £100,000 for charity via LoungeAid <p>FY24 progress</p> <ul style="list-style-type: none"> • Over 5,500 community events • £80,000 raised for charity through LoungeAid
Customers	Be proud of what we put on the plate	<p>Target for FY25:</p> <ul style="list-style-type: none"> • Establish working partnership and development calendar with nutritionists New Food Innovation Group • Target recipes and ingredients with the aim of reducing salt, sugar and saturated fats, and to increase fibre in our food. <p>FY24 progress</p> <ul style="list-style-type: none"> • A minimum of 18 vegan and 36 gluten free dishes per menu • At least two main dishes that contain fewer than 800 calories • Discovery phase with nutritionist with 2 rounds of menu analysis and kitchen visits
People	We care about our teams	<p>Target for FY25:</p> <ul style="list-style-type: none"> • 40% of our senior leaders to be female by FY29 • 50% of management roles to be filled by internal hires • Increase the % of our team who score “I enjoy working at Loungers” to 80% <p>FY24 progress</p> <ul style="list-style-type: none"> • 37% of female leaders • 40% of General Manager and Head Chef roles filled internally • 75% agree or strongly agree to the question “Overall I enjoy working at Loungers”
Planet	Deliver hospitality sustainably	<p>Target for FY25:</p> <ul style="list-style-type: none"> • Net zero by 2035 (Scopes 1 & 2) • Increase recycling by 10% and food composting by 20% by end of FY25 <p>FY24 progress:</p> <ul style="list-style-type: none"> • Emissions per £m turnover fallen by 6% • Trialled new bin system that is being rolled out in FY25
Suppliers	Work with our partners to raise standards	<p>Target for FY25:</p> <ul style="list-style-type: none"> • Actively encourage all food and drink suppliers to follow sustainable and ethical practices. • Better Chicken Commitment for 100% of the chicken in our supply chain by 2026 <p>FY24 progress:</p> <ul style="list-style-type: none"> • Linked to 91% of food and soft drinks suppliers on Sedex

Carbon footprint mapping

Loungers is targeting net zero operations (scopes 1 and 2) by 2035 and scope 3 by 2050. In FY24 we engaged an external expert to review our climate impacts as part of our sustainability reporting, in which we used a cost based model approved by the UK Government to measure scope 3 emissions for the first time. This has given us a baseline for understanding where we can target initiatives to drive the most change, recognising that with the pace of our growth, reducing our carbon footprint is particularly challenging. In order to balance that equation, we are focusing on two areas, maximizing efficiency and sustainability when we fit out our new sites and minimizing wastage, whether energy or rubbish, in our existing sites. Once we are confident that we are operating as efficiently as possible, we will explore options to move our energy supply to green sources.

Fuel choice & energy efficiency

As part of our new site fit out specifications, we prioritise electricity over gas, use LED lighting throughout and use air source heat pumps for heating and cooling. We set up close controls on systems such as lighting and ventilation, and are installing cellar management systems that reduce the energy required to store beer at the correct temperature. All new sites have efficient low volume flushes and aerating mixer taps which require less water, while we are also phasing out rinse hoses in our pot washes and replacing them with trigger activated low volume sprayers.

In the second half of FY24 we ran a trial with an external energy partner to review ways to change behaviours and control energy usage in sites and in FY25, we plan to roll this out more widely.

Waste

In terms of the physical waste from our sites, despite being zero waste to landfill, we wanted to target more waste being recycled or composted rather than being incinerated in an Energy from Waste plant. In FY24 we trialled a new bin system to make recycling more efficient, as well as reinforcing the importance of segregating food waste so that it can be composted. As the year end we had rolled this out across the entire estate, with the aim of increasing recycling by 10% and the volume of food waste sent for composting by 20% in FY25.

Scenario analysis

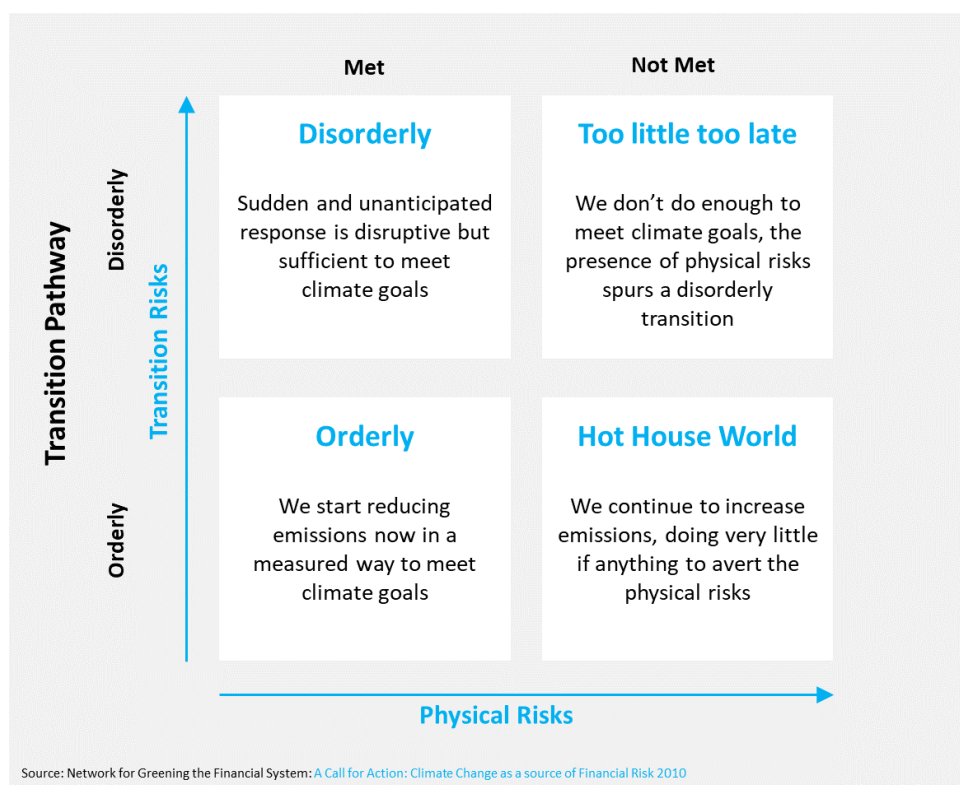
Loungers advisors have recommended adopting the London Stock Exchange guide⁴ to climate reporting which gives practical advice for reporting under TCFD that complements the TCFD's own guidance.

The pragmatic advice for those reporting on TCFD for the first time is not to get bogged down and overwhelmed by engaging in complex climate scenario modelling but to ask three pertinent questions:

1. **Would the business be profitable** if countries were successful in achieving goals of the Paris Agreement and there is an orderly transition to a low-carbon economy?
2. **Would the business be profitable** if there is an abrupt and disorderly transition as countries belatedly catch up on climate crisis?
3. **Would the business be profitable** if there is a failure to transition?

Using a model proposed initially for the financial sector those scenarios are mapped descriptively.

The recent pandemic gave an indication of what could happen to the business if consumers suddenly were unable to eat in restaurants outside the home. The overriding conclusion is that even though it became a financial challenge the business was structured well enough to survive financially and flourish again as life returned to normal.



The restaurant sector is of course at times restricted as financial pressures are felt by consumers but in the climate models above it illustrates how we only expect to come under severe climatic pressure if climate targets are not met and there is no orderly plan to transition.

TCFD legislation is currently only a legal requirement in the UK and New Zealand but is likely to be superseded by the international IFRS S1 and S2 standards. These are broadly similar and in line with the new Corporate Sustainability Reporting Directive (CSRD) and European Sustainability Reporting Standard (ESRS) reporting requirements in the European Union. Many countries are strengthening climate protection through such compulsory reporting platforms and although slower than required there is an undoubted upturn in plans to stave off the worst of the polluting activities and at least partially if not completely address climate targets.

⁴ [LSE guide to climate reporting final_0.pdf \(londonstockexchange.com\)](https://www.londonstockexchange.com/~/media/Investor-Relations/2021/04/LSE_guide_to_climate_reporting_final_0.pdf)

Scenario 1 – temperature rise of less than 2 degrees

In this scenario, government intervention through regulation and taxation as well as societal shifts in perception and behaviour limit the average temperature rise to 2 degrees. We would envisage carbon taxation, energy efficiency regulation and mandatory decarbonisation, alongside improvements in technology to maximise efficiency. In this environment, we would expect consumers to start shifting towards less carbon intensive food options as well as avoiding flights. All of these would potentially cause a significant increase in operational and capex costs which would require judicious actions on pricing and controllable costs such as labour. **In this scenario key risks would predominantly be transitional:**

Risk	Mitigation
Increased government intervention through areas such as carbon pricing, energy tax, efficiency regulations etc, resulting in higher operating costs and potential impacts on menu choices, fit out options etc	Menu innovation to reduce reliance on high emission products Partnership with suppliers to decarbonise supply chain Pricing decisions to consider carbon costs to preserve margin where needed More efficient technology in build process reduces operating costs for energy, waste etc
Failure to pivot quickly enough to low carbon options results in lack of compliance, with resulting reputational damage and financial penalties	Sustainability committee monitors risk horizon Targets in place to incentivise more efficient build strategies Strong relationships with external advisors to ensure we don't fall behind the curve

Scenario 2 – temperature rise of more than 2 degrees

In this scenario, regulation would be reactive rather than proactive, responding to extreme weather events as they arose. **Risks would therefore mainly be physical, from the impact of droughts, floods etc on our supply chain, our sites and our staff.**

Risk	Mitigation
Global weather becomes unpredictable, with extreme events impacting availability of key products in our supply chain	Menu innovation to remove products impacted by supply shortages as we did at the start of the Ukraine war Pricing decisions to offset costs that we cannot absorb
Extreme weather in the UK results in flooding in winter and heatwaves and water shortages in summer, impacting our ability to operate and the health of our staff	Flood risk monitored as part of Site Acquisition sign off process Diverse portfolio of sites enables us to offset risk in some with opportunities in others
Temperature volatility in the UK results in disruption to energy supply or digital infrastructure	Investigation of alternative energy generation sources Digital contingency plans for our data to look at alternative back up options

In this scenario, there could also be opportunities such as:

- New agriculture options in the UK in the warmer climate meaning that new supply chain options are open to us (e.g. wine)
- UK coastal areas become more desirable as holiday destinations, resulting in greater sales potential
- While it is difficult to predict the full impact of these events with certainty, Loungers believes that we will be able to develop plans that enable us to respond effectively to these scenarios and takes some comfort from the agility of our response to the Covid-19 pandemic, which severely impacted the hospitality industry but from which we have emerged strongly.

Loungers assessment : In general, across the globe there is a mix of orderly and disorderly transition, but ultimately, carbon emissions reduction will happen even if, as expected, the 2050 target is not met and there is an overshoot for a few years before falling to the desired level in the following decade. Adaptation will be needed as outlined in the risk analysis, but ultimately, if targets for global emissions are met and are on a reducing track we do not anticipate a major impact on our business. A full description of risk in key categories is provided in the risk management section.

UK Climate Risk

Climate risks as identified in the UK Climate Risk Assessment (CCRA3)⁵ and the input to that review in the Climate Change Committees Independent Assessment of UK Climate Risk⁶ have been used to determine potential areas of strategic risk in operations. Sector Briefings⁷ specific to key categories were considered: Agriculture and Food Sector; Business Sector; Energy Sector; Flooding and Coastal Change; Health and Social Care; High Temperatures; Land Use, Land-Use Change and Forestry; Marine and Coastal Environment.

The scenarios we considered is the basis of the CCRA3 risk assessment which describes specific risks that we address in our detailed risk tables on page 13.

With current commitments and ambition on emissions, global warming could reach between approximately 2°C and 4°C by the end of this century, or potentially even higher. Even if the international community meets the goals of the Paris Agreement, further climate change will occur and hence will require adaptation.

Loungers will face challenges similar to other UK businesses:

- the risk of flooding
- the risk of coastal change due to erosion, flooding and extreme weather events
- risks from disruption of supply chains and distribution networks
- Climate change outside the UK that affects UK businesses through investment, supply chains, distribution networks and other business relationships
- The risk to productivity from extreme heat

From the CCRA3 Briefing Documents a number of key scenarios were reviewed as presented in Appendix 1. Climate models used in CCRA3 are summarised in Appendix 2.

Energy Strategy

Our strategy will be to investigate the most rapid and cost effective way to electrify as much of the heating and cooking activities through a switch to electric options which by default will become net zero. Our direct use of energy is responsible for 98.7% of our Scope 1 and 2 footprint. We are now investigating the most rapid and cost effective way to electrify as much of our heating and cooking activities through a switch to electric options. Electricity will, by default, become net neutral if the UK grid is decarbonised by 2035, as expected. We anticipate that we will still use a small amount of gas at this time and, although there may be the possibility to switch this to hydrogen, we do not have high confidence that the speed of implementation will make this our best option.

The group will most likely be unable to install any renewable options such as wind turbines to provide significant energy to our sites and will be restricted to solar installation. In terms of emissions, this is a sensible option to remove both Scope 1 and Scope 2 and leave a small residual amount to neutralise with high quality carbon offsets.

Emissions reduction does not necessarily parallel energy efficiency, so we will continue to work with our energy partners to continually improve remote data streaming to monitor energy use and optimise operational usage by analysing positive and negative variance in energy consumption.

⁵ Betts, R.A. and Brown, K. (2021) Introduction. In: The Third UK Climate Change Risk Assessment Technical Report [Betts, R.A., Haward, A.B. and Pearson, K.V. (eds.)]. Prepared for the Climate Change Committee, London. [Technical-Report-The-Third-Climate-Change-Risk-Assessment.pdf \(ukclimaterisk.org\)](#)

⁶ [Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf \(theccc.org.uk\)](#)

⁷ [Sector Briefings - UK Climate Risk](#)

4.0 Risk Management

Risk Management

It is recommended that organisations disclose their processes for identifying, measuring and managing climate-related risks, as well as describing how these processes are integrated into the organisation's overall risk management.

Disclosure recommendations

- a) Describe the organisation's processes for identifying and assessing climate-related risks.
- b) Describe the organisation's processes for managing climate-related risks.

The principal risks are regularly reviewed by the Board such that our business longevity, brand reputation and environmental footprint are managed in a way which protects the interests of our business and its stakeholders.

Critical risks are identified and are those which would prevent the business operating or have a significant impact on profitability or reputation. These risks are disclosed in the Annual Report and Accounts.

Key risks are those which the business needs to consider and mitigate in the normal course of business. The impact of climate change has been included since the first TCFD report in 2023. The primary business risks are not revealed in detail here because that is subject to commercial sensitivity. Hence we discuss just the climate related risks below.

The business determines what it can mitigate, transfer, accept, or control. It has identified risks in the following timescales:

Short term (0-5 years)

- Compliance risk from evolving government regulation to meet climate targets, such as reporting requirements (IFRS S1 and S2), packaging tax, carbon tax, EPC standards etc. Failure to comply could attract financial penalties as well as reputational damage

Medium term (5-10 years)

- Warmer, wetter winters could bring more frequent flooding to the UK.
- Drier summers could lead to droughts / water shortages causing water stress in sites and increased energy costs for refrigeration and cooling
- Increased focus from customers and our teams on sustainability could impact our menus and the way we are perceived

Long term

- Extreme weather events could disrupt our supply chain for products such as coffee

ESG risks and opportunities

An analysis has been made of key risks that Loungers considered as a result of climate change. These have been classified as:

Physical: risks due to longer term shifts in climate patterns as acute or chronic

Transitional: risks in transitioning to a lower carbon economy, in line with the TCFD framework which suggests 4 areas: Policy, Market, Reputation and Technology

Risk categorization and detailed analysis of mitigating actions

Risk sector	Climate risk	Key impact and mitigation actions	Material impact likelihood	Timeframe for impact
TRANSITION				
Policy, Regulatory & Compliance	Regulation: Climate change	We have responded to legislation and potential legislation by significantly upscaling our carbon measurement. Legislation horizon scanning is important and continues. We have increased budget for professional fees to help meet compliance The Sustainability Committee (which includes an external sustainability expert) will monitor new legislation and report back to the Board on any impacts to allow Loungers to respond in a measured and timely fashion. We seek advice from external experts on energy and emissions reporting. Our teams use ICAEW to keep abreast of legislation	Low to Medium	Medium
	Regulation: Products and services	Plastic tax and recycled content have moved us to look in detail at what we can procure with greater recycled content and generally reduce plastic use and waste. Costs of potential compliance could be to require commercial properties to meet EPC band B by 2030; Our design and build process is currently compliant with existing legislation and we are ahead of the curve in many areas, such as our use of LED lighting in new sites. If regulations become more stringent we will evaluate the viability of compliance for existing sites and ensure that new sites are fitted out to meet required standards. OPPORTUNITY to save costs through focus on efficiency and reducing waste	Low to Medium	Medium
	Carbon price (Offsets)	Detailed mapping of scopes 1-3 has given an internal price of carbon to drive a net zero strategy and an incentive to reach that by abatement or fuel choice to minimise the carbon offset requirement; Future suggestion of a net zero or carbon neutralisation tax will continue to make this an important risk area	Low to Medium	Medium
Market: supply and demand	Cost of energy and purchased goods	Energy efficiency continuous monitoring via data streaming will be introduced; Building Insulation and energy management programme strengthened; OPPORTUNITY: reduced reliance on overseas products currently requiring hotter climates (e.g. wine)	Low to Medium	Medium
	Consumer preference	There could be a cultural shift to prioritise sustainability. We take frequent feedback from our customers and employees which is reviewed when making menu and policy decisions. We have appointed an industry expert to our Sustainability Committee and worked with specialists (Maltdoctor Ltd, Zero Carbon Forum) to help us lead sustainability performance OPPORTUNITY to differentiate ourselves through the quality of our sustainable offerings both to customers (e.g. variety of vegan menu) and staff (e.g. electric car salary sacrifice scheme) Investigate link between carbon footprint & vegetarian/vegan & lower carbon and red/white meat to plant-based options as combined nutritional and emissions reduction options	Medium	Medium

Risk sector	Climate risk	Key impact and mitigation actions	Timeframe for impact	
TRANSITION				
Reputation	Stakeholder concern	<p>We have strengthened our credibility for leading ESG by appointing experts to our committees and advisers who have already achieved leading sustainability performance; We thus seek to avoid the potential of fines and reputation damage for non-compliance on climate reduction;</p> <p>In recent years, there has been a shift to more sustainable choices in consumer behaviour, whether that be lower food miles, less plastic packaging or alternatives to meat. This is often most evident in younger demographics, who also comprise many of our staff. Being able to demonstrate credible sustainable offerings and behaviours will therefore become increasingly important to retain both customers and employees.</p> <p>To mitigate this risk, we are already pursuing a number of initiatives including:</p> <p>Only sourcing eggs from free range chickens; Using a zero waste to landfill waste collection service; Only serving Fairtrade tea and coffee; Offering an extensive vegetarian and vegan menu. We also collect detailed feedback from our guests which can be analysed by our Insight team to identify trends in behaviour and consumer responses. The Sustainability Committee will use this and data from employee surveys to find ways to engage with employees and customers to communicate the message of Loungers as a force for good.</p>	Medium	Medium
Technology	Lower emission offerings for services	Embedded carbon could become a competitive procurement option as supply chains decarbonise	Low to Medium	Medium
	Lower emission technology	<p>New technology could see a step change in emissions e.g. switch to electricity from fossil fuel and hydrogen availability. Our action is to parallel grid decarbonisation and install widescale electrification where cost effective</p> <p>OPPORTUNITY: To identify new sustainable processes and technology to improve efficiency and specifically on reductions in waste and recycling options across the business</p>	Medium	Short

Risk sector	Climate risk	Key impact and mitigation actions	Timeframe for impact
PHYSICAL			
Acute	Flooding and Rainfall	<p>A minimal number of our sites are in coastal or riverside locations are at risk of flooding. Risk of flooding is considered as part of the risk planning at board meetings and when selecting new sites; It is monitored also through the annual insurance reviews process;</p> <p>We have seen increasingly wetter winters in recent years, with December 2022 being the wettest on record. There have been a number of serious flooding events across the UK over the past 15 years and if this trend accelerates due to global warming, we could see potential risk of flooding in our riverside and coastal sites.</p> <p>A review of our sites by locations deemed to be at risk of flooding has identified 28 sites potentially at risk of river flooding; 13 sites potentially at risk of coastal flooding. It is important to note that this assessment has been based on the proximity of sites to water sources; it therefore indicates that a site could flood, not necessarily that it will. There may be other factors that would prevent or mitigate flooding (e.g. despite its proximity to a river, a site might be sufficiently high above the water level to make flooding unlikely). We will refine the list to identify sites where we deem the risk to be significant. If climate change accelerates this risk we will take a more conservative approach.</p>	Low to Medium

Risk sector	Climate risk	Key impact and mitigation actions	Timeframe for impact	
PHYSICAL				
Chronic	Average temperature rise; Drier, hotter summers	We anticipate increased energy costs for refrigeration and air conditioning on sites; Potential impacts are alarm systems not working at higher temperatures; employee productivity may decrease in non-cooled environments; human health could be impacted positively (less winter sickness) and negatively (heat intolerance) Our portfolio of sites has a mix of indoor and outdoor space and suburban/coastal locations. When designing new sites we incorporate technology such as heat pumps to maximise efficiency	Medium to High	Medium
	Water availability	Drier summers lead to droughts and water shortage which would impact water stress on our sites. Water availability is expected to become a greater issue over the next 30 years; If summers do become hotter, we may need to incur costs for additional air conditioning for both front of house and back of house. From a consumer perspective sites without outside space or air conditioning may become less attractive and therefore we may lose sales or need to offer more incentives for customers to visit these sites. Conversely, our sites with outside spaces or in coastal locations may benefit from additional footfall. Clearly additional usage of air conditioning is not desirable from either a cost or a climate perspective. When considering the locations of sites in the future, ensuring that we retain a balanced portfolio of sites will be important, as will trying to incorporate designs, materials and layouts that maximise energy efficiency.	Low to Medium	Medium-Long
	Supply chain disruption due to extreme weather	Global drought could impact our suppliers particularly for coffee growers; Agriculture is one of the sectors most at risk from climate change, in terms of its dependence on soil characteristics, weather patterns and biodiversity. The increase in extreme weather events will impact crop growth and yields as well as the distribution and abundance of pest species. It is possible that in the longer term certain foods will become more expensive and more difficult to source; however it is also possible that there will be opportunity to increase production in the UK in certain areas such as wine. As these risks increase, it will become more important to ensure that we understand and have visibility over the whole of our supply chain. We are currently dependent on large national wholesalers and ensuring that they have a diversified portfolio of supply and can be agile in the face of supply chain challenges will be key. We should also ensure that we have contingency plans in place for alternative supply. OPPORTUNITY: to review product lists on a regular basis with key suppliers. Tools such as SEDEX will also give us greater visibility over our supply chain to make better informed decisions	Medium to High	Long
	Temperature fluctuations: Energy sector	Electricity delivery could be at greatest risk from high and low temperatures which will be exacerbated as there is a large scale move to electrification from natural gas or fossil fuels	Medium	Medium
	Temperature fluctuations: Digital network	Heat and humidity can affect data centres as can lightning and high winds. Consideration may need to be given to different storage options other than cloud for example	Medium	Medium

Critical risks: Additional background to risk assessments

Increased rainfall over UK winters increases flood risk

We have seen increasingly wetter winters in recent years, with 2023 as a whole seeing 11% more rain than the average as well as nine named storms to the end of January 2024. There have been a number of serious flooding events across the UK over the past 15 years and if this trend accelerates due to global warming, we could see potential risk of flooding in our riverside and coastal sites. It is important to note that this assessment has been based on the proximity of sites to water sources; it therefore indicates that a site could flood, not necessarily that it will. There may be other factors that would prevent or mitigate flooding (e.g. despite its proximity to a river, a site might be sufficiently high above the water level to make flooding unlikely).

Drier summers leads to drought / water shortages

The summer of 2022 saw droughts declared and hosepipe bans enforced in a number of areas across England. The heat led to difficult working conditions in kitchens for our staff and put more strain on refrigeration and cooling in sites, increasing energy consumption. If summers do become hotter, we may need to incur costs for additional air conditioning, both front of house and back of house. From a consumer perspective sites without outside space may become less attractive and therefore we may lose sales or need to offer more incentives for customers to visit these sites. Conversely, our sites with outside spaces or in coastal locations may benefit from additional footfall. Clearly additional usage of air conditioning is not desirable from either a cost or a climate perspective. When considering the locations of sites in the future, ensuring that we retain a balanced portfolio of sites will be important, as will trying to incorporate designs, materials and layouts that maximise energy efficiency.

Extreme weather events cause disruption in supply chain

Agriculture is one of the sectors most at risk from climate change, in terms of its dependence on soil characteristics, weather patterns and biodiversity. The increase in extreme weather events will impact crop growth and yields as well as the distribution and abundance of pest species. It is possible that in the longer term certain foods will become more expensive and more difficult to source; however it is also possible that there will be opportunity to increase production in the UK in certain areas such as wine.

As these risks increase, it will become more important that we ensure that we understand and have visibility over the whole of our supply chain. We are currently dependent on large national wholesalers and ensuring that they have a diversified portfolio of supply and can be agile in the face of supply chain challenges will be key. We should also ensure that we have contingency plans in place for alternative supply, which we have demonstrated to an extent over the past 18 months as we reacted to input supply cost inflation following the invasion of Ukraine.

Compliance and cost risk from government regulation

While there is some uncertainty over the direction of green policy in the light of an impending general election, there are a number of recent regulations impacting Loungers in the short to medium term:

- Move from the recommendations of the TCFD to IFRS S1 and S2, requiring more detailed information about industry risks and metrics, mandatory scope 3 reporting and financial quantification of sustainability risks and opportunities (FY25)
- ESOS – a mandatory energy assessment scheme that requires us to audit the energy used by our buildings, processes and transport
- EPCs for commercial properties to be at least B by 2030

Our design and build process is currently compliant with existing legislation and we continually seek to optimize our efficiency through technologies such as air source heat pumps. If regulations become more stringent we will evaluate the viability of compliance for existing sites and ensure that new sites are fitted out to meet required standards. The Sustainability Committee (which includes an external sustainability expert) will monitor new legislation and report back to the Board on any impacts in order to allow Loungers to respond in a measured and timely fashion.

Cultural shift to prioritising sustainability

In recent years, there has been a shift to more sustainable choices in consumer behaviour, whether that be lower food miles, less plastic packaging or alternatives to meat. This is often most evident in younger demographics, who also comprise a lot of our staff. Being able to demonstrate credible sustainable offerings and behaviours will therefore become increasingly important to retain both customers and employees.

In terms of mitigating this risk, we are already pursuing a number of initiatives including:

- Only sourcing eggs from free range chickens
- Using a zero waste to landfill waste collection service
- Only serving Fairtrade tea and coffee
- Offering an extensive vegetarian and vegan menu

We also collect detailed feedback from our guests which can be analysed by our Insight team to identify trends in behaviour and consumer responses.

5.0 Future reporting – IFRS S1 and S2

Our recent reporting has incorporated the recommendations from the TCFD as adopted by the Companies Act, but the taskforce has now been disbanded with the reporting requirements being consolidated into IFRS standards S1 and S2. For UK Companies, these standards will become effective as part of UK SRS, which are expected to become effective no earlier than 1 January 2026.

IFRS S1 and S2 are standards not frameworks like TCFD so they are more significant. S1 concentrates on structure and strategy whilst S2 focusses on risk and opportunity.

Similar to TCFD the 4 areas to disclose are:

- **governance processes**, controls and procedures the entity uses to monitor, manage and oversee sustainability-related risks and opportunities;
- the entity's **strategy** for managing sustainability-related risks and opportunities;
- the processes the entity uses to identify, assess, prioritise and monitor sustainability-related **risks and opportunities**; and the entity's performance in relation to sustainability-related risks and opportunities,
- progress towards any **targets** the entity has set or is required to meet by law or regulation.

Whilst S1 and S2 incorporate all the elements of TCFD there are a few key enhancements:

- The focus of the disclosures widens to sustainability more generally, rather than purely climate change
- Companies are required to consider risks and opportunities in their specific sector in accordance with specified standards, including reporting on metrics set out in the industry standards
- Companies are required to report scope 3 emissions
- Companies are required to provide more quantitative assessments of the impact of sustainability risks on cash flows, financial position and income

The sectors most applicable to our business are Food and Beverage and Agricultural products

The new metrics that we will be required to report on are as per the table below. The Sustainability committee has begun reviewing these to ensure that we will be able to capture this data from the required effective date.

Sustainability Disclosure Topics & Metrics required for IFRS S 1 and S2

Green shading: already being reported

Sustainability Disclosure Topics & Metrics				
Topic	Metric	Category	Unit of Measure	Code
Greenhouse Gas Emissions	Gross global Scope 1 emissions	Quantitative	Metric tons (t) CO ₂ -e	FB-AG-110a.1
	Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	FB-AG-110a.2
	Fleet fuel consumed, percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-AG-110a.3
Energy Management	(1) Total energy consumed, (2) percentage grid electricity and (3) percentage renewable	Quantitative	Gigajoules (GJ), Percentage (%)	FB-RN-130a.1
Water Management	(1) Total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic metres (m ³), Percentage (%)	FB-RN-140a.1
Supply Chain Management & Food Sourcing	Percentage of food purchased that (1) meets environmental and social sourcing standards, and (2) is certified to third-party environmental or social standards	Quantitative	Percentage (%) by cost	FB-RN-430a.1
	Discussion of strategy to manage environmental and social risks within the supply chain, including animal welfare	Discussion and Analysis	n/a	FB-RN-430a.3

Activity Metrics			
Activity Metric	Category	Unit of Measure	Code
Number of (1) entity-owned and (2) franchise restaurants	Quantitative	Number	FB-RN-000.A
Number of employees at (1) entity-owned and (2) franchise locations	Quantitative	Number	FB-RN-000.B

5.0 Metrics and Targets

Metrics and targets

It is recommended that organisations disclose the metrics and targets they use to assess and monitor climate-related risks and opportunities.

Disclosure recommendations

- a) Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.
- b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
- c) Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.

Loungers engaged a specialist consultant to calculate the carbon footprint of the whole supply chain from procurement of purchased goods and services through operations and included the impact of sold goods and services. Data analysis followed the GHG protocol for all three scopes: Scopes 1 and 2, operational carbon footprint and Scope 3, supply chain carbon footprint.

Data gathered was a hybrid set based on the GHG protocol hierarchy which specifies four levels of data that can be captured: 1) Supplier specific, 2) Hybrid, 3) Industry average and 4) Spend-based.

For Scopes 1 and 2, detailed invoiced electricity and gas consumption and owned transportation data was available together with the relevant carbon conversion factors and will therefore be highly accurate.

Scope 3 data is notoriously difficult to measure in the supply chain so as a first pass estimation the spend-based analysis method has been used. The method is approved by the Department of Energy Security and Net Zero (DESNZ) within its Streamlined Energy and Carbon Reporting emissions and is based on a model developed by the University of Leeds available as open source on the DESNZ website.

The key metric at board level for carbon emissions is tonnes CO₂e/£m turnover. Loungers are using a baseline year of 2022 as a springboard to enable them to track progress to net zero by 2035 for operational emissions.

A series of carbon and wider Environmental Social Governance activities provide an engaging set of activities to drive business emissions downwards to net zero and to engage its supply chain to follow a similar path. The net zero target is for operational emissions over which Loungers has direct influence. Scope 3 emissions do not currently have a target set other than awareness and education within the business and the wider supply chain.

The in-depth analysis will be maintained until we hit our net zero target and will enable our investors and other stakeholders to understand our desire to be as open and comprehensive in our analysis of carbon with a view to establishing a robust financial impact of the required technological changes to get to net zero and the benefits of a clear set of metrics to map progress.

Spend-based accounting model

The model was developed for the UK government by the University of Leeds and in use for almost 20 years. It was last updated in November 2022. The model provides spend-based carbon emissions for 110 standard industry classification categories

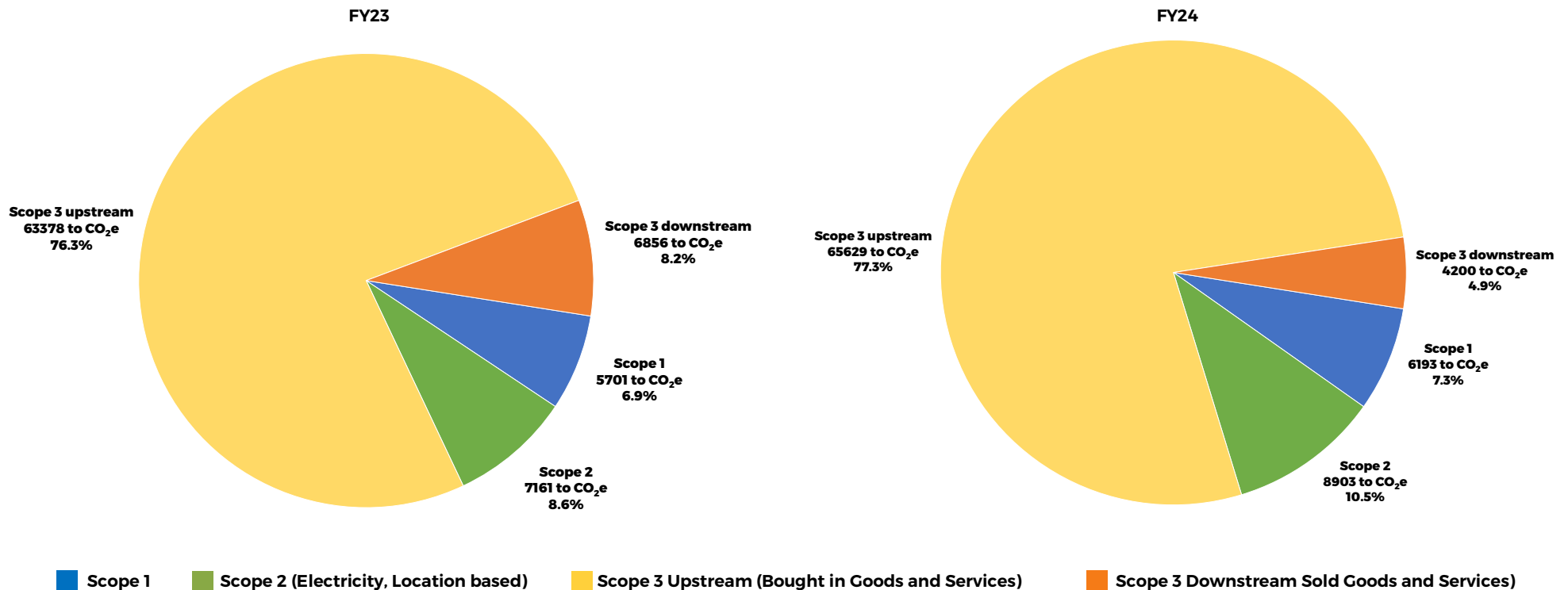
The limitation of Scope 3 spend-based analysis is that it gives an estimated average figure for each category. Therefore it is useful for an initial mapping of Scope 3, but will not easily show an improvement in those emissions over time.

Where a spend-based estimation indicates a contributing factor has a high percentage it is Loungers' aim to engage with those supply chain partners and request more detailed carbon footprint data if they can provide it and that value once ratified will be substituted for spend based assessment in future calculations.

Carbon footprint analysis

A detailed analysis of the carbon footprint has been made for FY24 (April 2023 to March 2024.) The model for assessing spend based emissions has been updated and for easier comparison the FY23 data is restated on the same basis as the factors used for FY24. There is a change in the analysis of Scope 3 downstream which previously was considered overstated considering that there is little downstream impact of food and drink sold because it is consumed on the premises.

Operational (Scope 1 and 2) carbon emissions are a small proportion of the overall carbon footprint (15-17%). The electricity conversion uses a location-based carbon factor from UK government reporting guidelines. Scope 3 in total is around 82-84% which is in line with most businesses.



Location and Market based electricity

The Greenhouse Gas Protocol requires organisations to publish emissions according to the electricity supplied as is through the grid, called **location based**. The grid supply is a mix of renewable and non-renewable electricity energy. On average at present it is dropping in intensity by around 9-10% a year towards the stated target of being net zero emission by 2035.

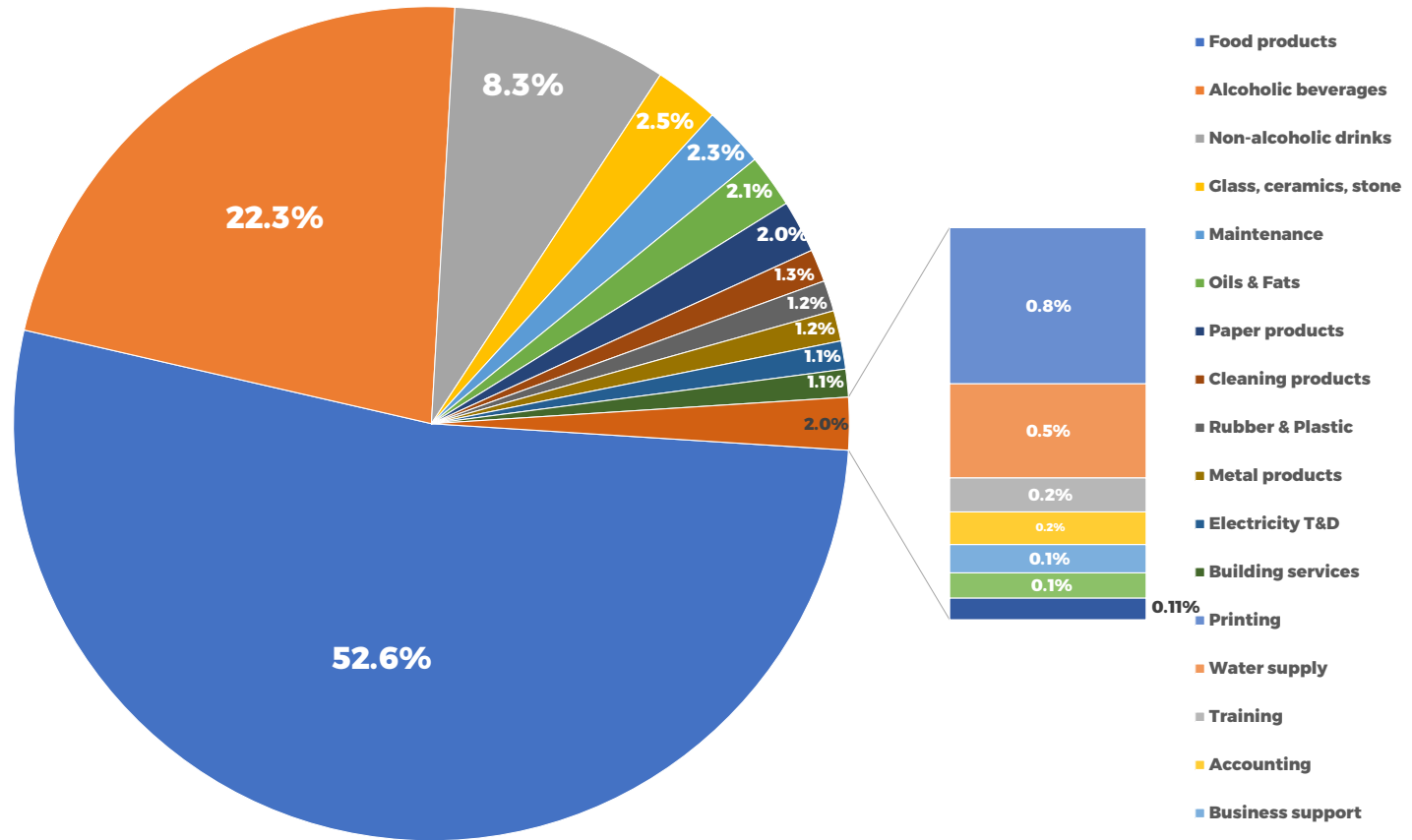
If any specific contract has been made for renewable energy it can in addition be shown in a carbon emissions report as a market-based conversion factor.

The next two graphs analyse Scope 3 emissions for Upstream sources: goods and services coming into the business and Downstream: goods and services sold by the business.

Scope 3 UPSTREAM analysis by category

Upstream not surprisingly is dominated (83.2%) by 3 categories: food (52.6%) then alcoholic beverages (22.3%) and non-alcoholic drinks (8.3%)

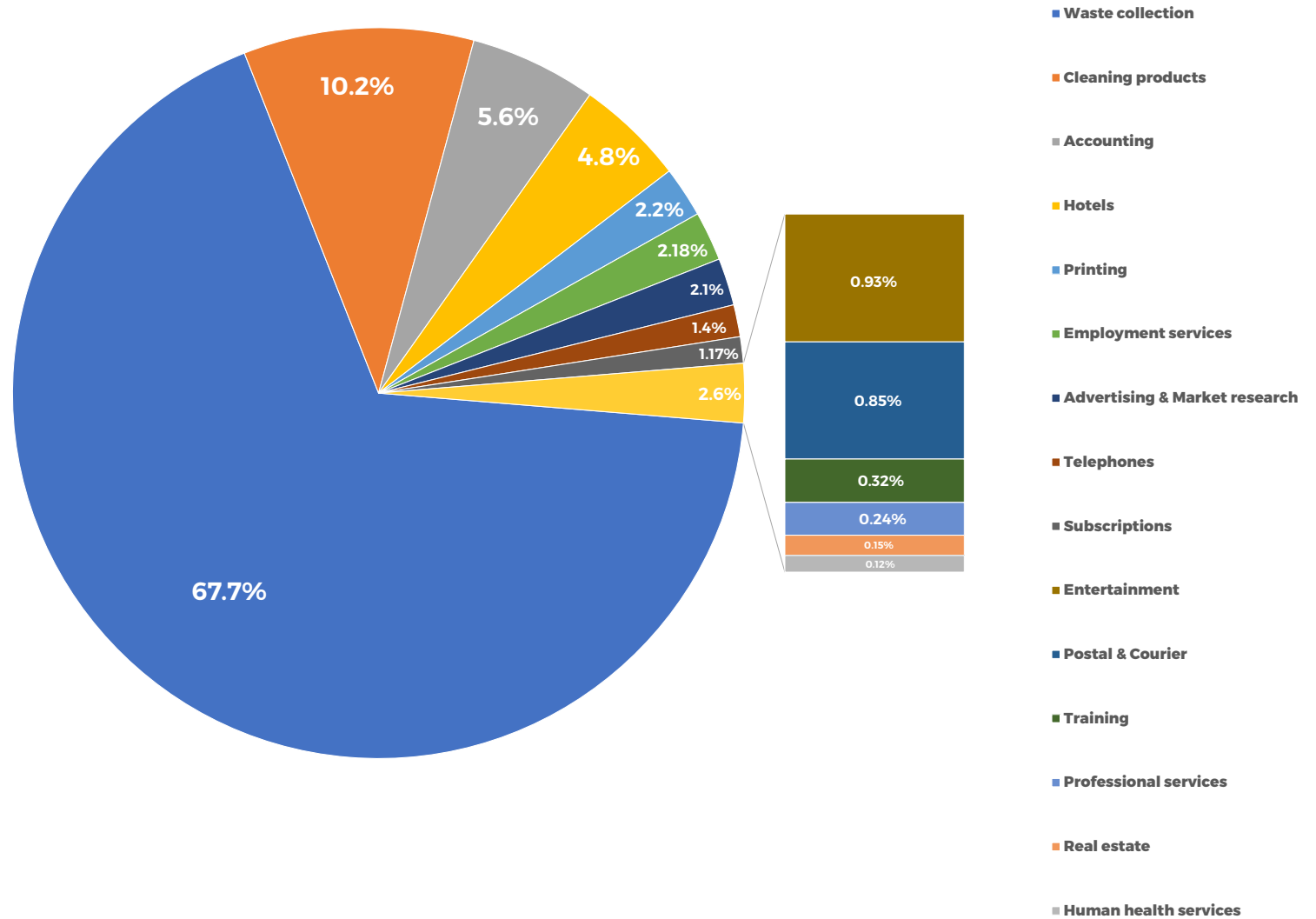
A number of other factors contribute 16.8% of the total.



Downstream emissions profile for a restaurant business where the food is consumed on the premises is dominated by waste collection. Loungers, however, have a policy of zero to landfill so focus that waste collection on recycling where possible. Most waste processing collection companies now try to use incineration rather than landfill as they have the legal responsibility to avoid as much landfill and recover as much as possible.

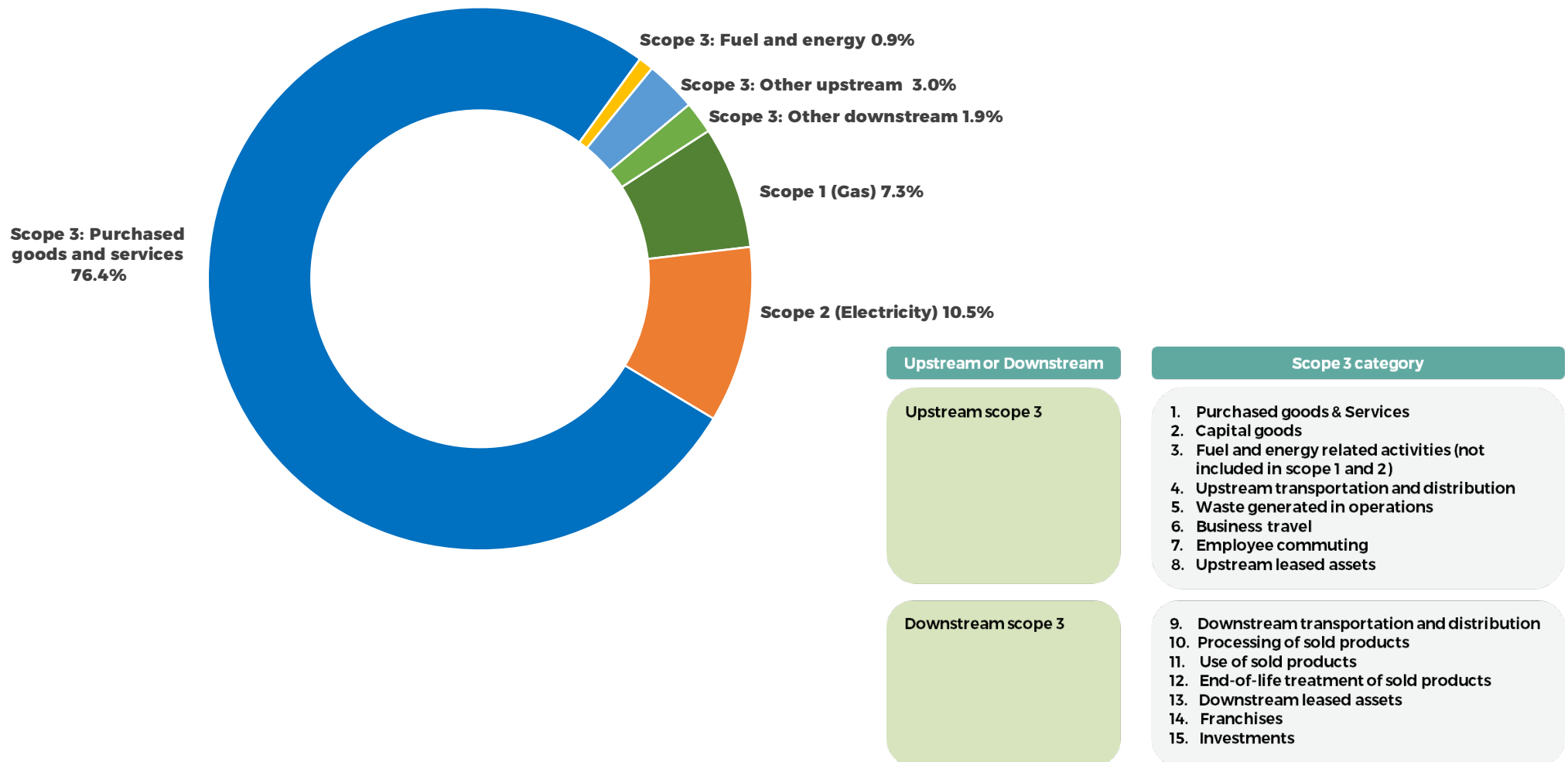
Cleaning and business support services form the remainder of the downstream emissions

Scope 3 DOWNSTREAM analysis by category



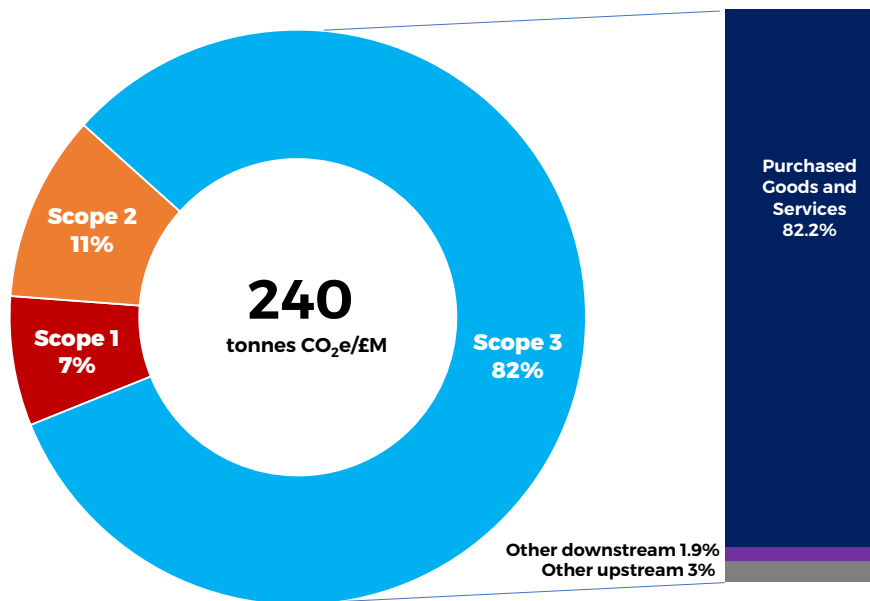
The analysis provides Loungers with a good indication of who to engage with in the supply chain to effect the greatest understanding and reduction of carbon emissions from suppliers and to continue to focus on ways to reduce the embedded carbon in products that are sold to consumers. The key area is food bought in and sold and reductions in supply carbon naturally will lead to reductions in the embedded carbon passed on in products sold to consumers.

The GHG protocol also recommends that Scope 3 is analysed in 15 categories or as many as it is possible to identify. The data in the mapping exercise for FY24 has been allocated to 6 of those categories and purchased goods and services and use of sold products are the major emissions areas.

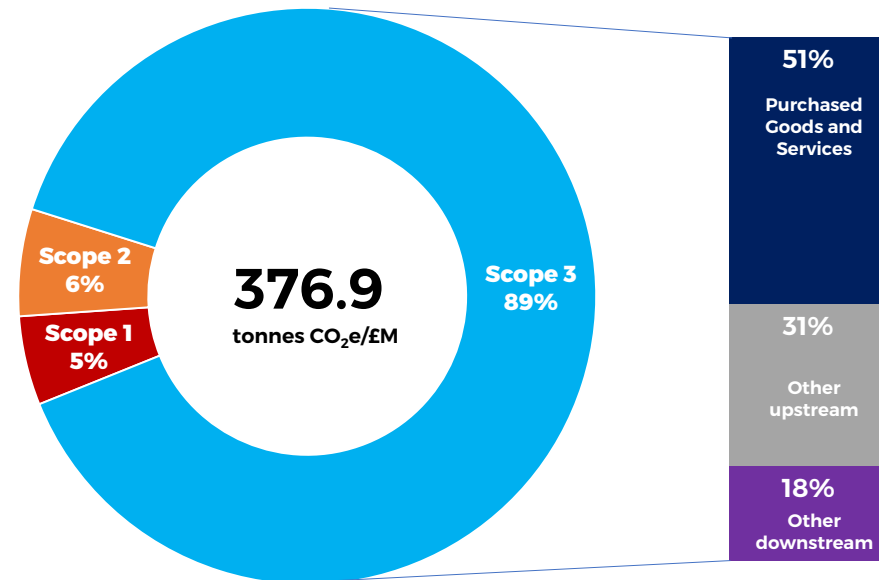


It is beneficial to benchmark against others in the same sector. For the restaurant sector generally it is only possible to find a comparison where there could be a considerable downstream component with takeaway food. Loungers has a metric smaller than that published in the Zero Carbon Forum combined restaurant sector. Using a benchmark of tonnes CO₂e/£M turnover for all three scopes Loungers intensity ratio is 240 tonnes CO₂e/£M which compares favourably with other data published for all restaurants which would be expected to be higher with provision of take out services and is 376.9 tonnes CO₂e/£M.

Loungers scope 1-3 analysis and intensity ratio FY24



Restaurant sector analysis by Zero Carbon Forum



This is the second year that Loungers has made such a comprehensive study into the full Scope 1-3 emissions and the data accuracy and analysis is being honed to improve the ability to identify key areas for improvement and direct measurement. The aim is to better understand scope 3 supply chain emissions and to influence and encourage the supply chain to reduce the embedded emissions in the goods and services that are procured. It will require interaction with suppliers to gain real data on carbon emissions that we can use to track improvement and it is anticipated that there will need to be a programme of education and carbon literacy support to gain the best result. Loungers is committed to working with its suppliers to enable them to better understand their carbon emissions intensity and wider ESG performance in a spirit of cooperation and support.

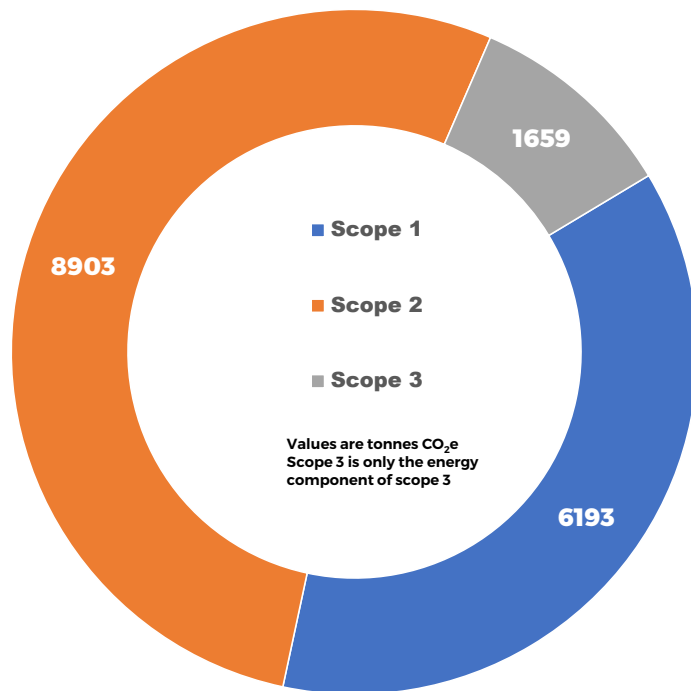
Streamlined energy and carbon reporting (SECR) and base year data

Loungers has adopted FY23 (April 2022-April 2023) as the base year for tracking progress. 2021-2 (FY2022) was still affected by Covid19 uncertainty, which could skew the baseline.

The latest SECR report, excerpts of which are shown below, provides data for the past 2 years and intensity ratios for just the energy-related components of Scopes 1-3. This is the required metric for SECR but inclusion of the wider Scope 3 data gives a clearer direction about supply chain hot spots rather than relying on the energy component alone.

The energy component of Scope 3 which comprises transport and electricity transmission and distribution losses is extremely small at just 1.1% of Scope 3 total emissions and not an effective way to target scope 3 emissions reductions hence Loungers use the full Scope 3 assessment.

GHG Scope analysis Loungers plc FY24



GHG emissions scope	GHG emissions tonnes CO ₂ e		
	FY2024	FY2023	FY2022
Scope 1	6193	5701	5992
Scope 2	8903	7161	5543
Scope 3	1659	1370	893

Intensity metrics

Input data	FY2024	FY2023	FY2022
Scope 1-3 carbon footprint (energy related; tonnes CO ₂ e)	16755	14232	12428
Turnover (£M)	353.5	283.5	237.3
Intensity ratio (tonnes CO ₂ e / £M turnover)	47.4	50.2	52.4

Identifying Loungers maturity level in TCFD reporting

There is an index called the Transition Pathway Initiative (TPI)⁸ that is a global, asset-owner led initiative which assesses companies' preparedness for the transition to a low carbon economy to provide investors with an indication of how mature a company is with TCFD assessment.

Having made a candid assessment internally within Loungers of where we are, it is evident through this report that our maturity is somewhere between level 3 and 4 which is very encouraging since this is our first year of reporting.

Loungers will continue to monitor performance against the TPI to progress towards a full level 4 rating.

LEVEL 0 Unaware	LEVEL 1 Awareness	LEVEL 2 Building capacity	LEVEL 3 Integrated into operational decision-making	LEVEL 4 Strategic assessment
Company does not recognise climate change as a significant issue for the business	<p>Company explicitly recognises climate change as a relevant risk/opportunity for the business</p> <p>Company has a policy (or equivalent) commitment to action on climate change</p>	<p>Company has set GHG emission reduction targets</p> <p>Company has published information on its operational GHG emissions</p>	<p>Company has nominated a board member / committee with explicit responsibility for oversight of the climate change possibility</p> <p>Company has set quantitative targets for reducing its GHG emissions</p> <p>Company reports on its Scope 3 GHG emissions</p> <p>Company has had its operational GHG emissions data verified</p> <p>Company supports domestic and international efforts to mitigate climate change</p> <p>Company discloses membership and involvement in trade associations engaged on climate</p> <p>Company has a process to manage climate-related risks</p> <p>Company discloses Scope 3 GHG emissions from use of sold products (selected sectors only)</p>	<p>Company has set long-term quantitative targets (more than five years) for reducing its GHG emissions</p> <p>Company has incorporated climate change performance into executive remuneration</p> <p>Company has incorporated climate change risks and opportunities in its strategy</p> <p>Company undertakes climate scenario planning</p> <p>Company discloses on an internal carbon price</p> <p>Company ensures consistency between its climate change policy and position of trade associations of which it is a member</p>

⁸ [Home - Transition Pathway Initiative](#)

APPENDIX 1: CCRA3 risk statements considered during assessment of risk

From the Business Sector Briefing

Risks to businesses from flooding (B1)

Damages to buildings could increase in a 2°C warming scenario by around 27% by 2050 and 40% by 2080, and in a 4°C scenario by around 44% by 2050 and 75% by 2080. These projections assume no changes in the asset base or size of the economy.

Costs to businesses arise from damage to sites as well as from business interruption and indirect losses, such as lost production time and associated costs. Flood risk management actions being taken forward, including flood protection and planning and preparedness through business continuity management, is encouraging but given the scale and the wider implications for the economy and society at large, more action would be beneficial.

The availability of insurance and costs of capital could increase the magnitude even further unless risk levels are reduced through corporate as well as community-level adaptation action.

Flooding and coastal change is expected to become a high risk from the 2050s for all UK countries. Without further adaptation, damages could increase by around 30% by 2050 and 73% by 2080 under a 2°C scenario. In a 4°C scenario the damages could rise by around 82% by 2050 and 181% by 2080.

Risks to business from water scarcity (B3)

Present-day risks from water scarcity are low, but these could rise significantly over the next 30 years and beyond, in both public water supply and direct abstractions from rivers and other sources. The future magnitude of risk is considered medium across the UK. Many parts of the UK may be affected, not just southern regions.

Access to capital for businesses (B4)

In a 4°C warming scenario, the assessment has highlighted that climate change impacts could be largely uninsurable due to the sheer scale and extent of damages.

As a global financial hub, the UK needs more consideration of the implications for companies of physical risks across countries and regions. Internalising climate risk and pricing it into insurance, lending or investment decisions will have implications for those relying on access to capital and insurance.

Currently there is limited evidence of physical climate risks affecting price changes, but this could change suddenly in the wake of more extreme events.

The magnitude of risk is currently considered medium, potentially increasing to high in a 4°C warming scenario.

Risks due to infrastructure disruption and higher temperatures in working environments (B5)

The risk is currently considered low magnitude, but could rise to medium or even high in the future, particularly in England.

REM: fire alarms not working in 40C temperatures during 2022 summer

High temperatures can have negative impacts on employees' health and wellbeing and ability to commute to work.

The risk is low to medium across the UK by the 2050s, but could become high by the 2080s.

Risks to business from disruption to supply chains and distribution networks (B6)

Actions to mitigate:

- Product and geographical diversification.
- Scenario planning for extreme weather events.
- Incorporating risks into risk registers and management programmes.
- Including supply chain partners in risk assessment, planning, and communication.
- Improving insurance coverage.

From the Flooding and Coastal Change Briefing

Risks to infrastructure services from river, surface water flooding (I2)

Data show that 178 power stations and 575 substations are currently at significant risk from surface water flooding and 67 power stations and 234 substations are at risk from river flooding across the UK. The risk increases significantly from surface water flooding in the future, potentially doubling the risk in a 4°C warming scenario.

Conversely, the risks from river flooding to energy infrastructure generally decrease in the future.

Currently transport infrastructure faces greater exposure to surface water flooding than river flooding. For example, 596 railway stations and 3,544km of rail network are at risk from surface water flooding across the UK compared to 81 railway stations and 1,144km of rail network at risk from river flooding

Risks to the energy sector from high and low temperatures, high winds, lightning (I10) Communications infrastructure supporting telemetry components in the national gas grid have been found to have a maximum operating temperature of 40°C (where external temperature and the load on the asset are contributing factors), a threshold that is becoming increasingly likely to occur across the UK.

Failures to the electricity system are likely to have much larger impacts in the future if both transport and home energy supply are fully electrified as the UK moves towards net zero emissions of greenhouse gases

Risks to digital infrastructure from high and low temperatures, high winds, lightning (I13)

Heat and humidity pose a challenge for data centres, which need to be kept cool to operate. Risks to digital systems from climate change are currently considered to be of medium magnitude under different climate change scenarios, although the quality of the evidence supporting this conclusion is low. While there is a general understanding of the interactions between ICT infrastructure and weather, quantitative assessment of how climate change will affect the frequency and magnitude of interruptions is lacking.

A further challenge to assessing risk nationally is that the location or specification of assets is often kept out of the public domain in the interests of security and commercial sensitivity. ICT is critical to the operation of wider infrastructure networks and underpins access to key services and wider communication, and therefore interruption can have wide ranging and cascading impacts. The risk is low now, rising to medium from the 2050s across the UK.

From the High Temperatures Briefing

Risks to transport from high and low temperatures, high winds, lightning (I12)

Extreme heat can cause multiple problems to transport. Although there are examples of good practice in adaptation within different transport modes, particularly in rail, the understanding and management of risks across the sector is inconsistent.

Actions being taken to reduce risk by the rail industry are likely to be reducing vulnerability in some areas, but evidence is lacking on how far vulnerability or exposure are being reduced. There is also a lack of quantified data on the impact of high temperatures on road infrastructure, thus confidence in the evidence is low. A full understanding of the future risks will also require an assessment of the energy and digital infrastructure supporting electrified transport systems required to meet the UK' net zero carbon targets.

The risk is medium magnitude now, rising to high in the future.

APPENDIX 2: Climate models

The UK Climate assessment last published in 2021 (CCRA3) considered four models of climate change called Representative Concentration Pathways (RCP). It uses scenarios from RCP2.6 to RCP 8.5. RCP6.0 is used to define the higher climate change scenario used in the CCRA3 Technical Report

Characterising future climate change: pathways to 2°C and 4°C global warming at the end of the 21st Century.

In the mitigation domain, the characterisation of 2°C and 4°C warming pathways is a useful proxy for considering the costs of inaction, and the possible benefits of global emissions reductions. However, the aim of the CCRA3 is to inform adaptation and centre on the urgency of short-term action that is needed in the next five-year period to help adapt to uncertain futures. The aim of the modelling is to identify what is needed today, given a wide range of outcomes are possible that span this range. For adaptation, time matters, i.e. it makes a big difference if 2°C warming is exceeded in 2050 or towards late century. For this reason, two time periods are considered, the 2050s and 2080s.

CCRA3 characterises the future in terms of pathways to approximate levels of global mean warming by the end of the century (2°C vs 4°C) and considers the uncertainty in the climate projections for each of these pathways. For simplicity and clarity, CCRA3 uses two broad pathways to help sample the evidence. The lower pathway represents, approximately, the level of climate change if the goals of the Paris Agreement are met. The higher pathway represents the upper end of climate outcomes consistent with current worldwide policies.

The pathway to 2°C global warming by 2100: This is representative of stabilisation of global warming at approximately 1.5°C to 2.5°C above pre-industrial by the end of the 21st Century. This aligns to the goal of the Paris Agreement to limit warming to “well below” 2°C and “pursue efforts” to limit warming to 1.5°C.

The pathway to 4°C global warming at the end of the century. 2080 – 2100. This represents the upper end of climate projections consistent with current worldwide policies

RCP scenarios: Representative Concentration Pathways

RCP scenarios explicitly explore the impact of different climate policies to allow cost-benefit evaluation of long-term climate goals. They are designed to provide plausible future scenarios of human emissions patterns.

There are a number of RCP scenarios which relate to different increases in global mean temperature:

RCP 1.9	~1 to ~1.5°C increase - aligns with 2015 Paris Agreement	RCP 6	emissions peak around 2080, then decline
RCP 2.0	~1.5 to ~2°C increase – a very stringent pathway	RCP7	baseline outcome rather than a mitigation target
RCP 3.0	~2 to ~2.4 °C increase – an intermediate pathway	RCP 8.5	emissions continue to rise through 21st century
RCP 4.0	~2.5 to ~3 °C increase – a less stringent pathway		

Shared Socioeconomic Pathways (SSP)

SSP are a parallel set of models that include more than just global warming

To help inform CCRA3, the Climate Change Committee commissioned a new set of UK socioeconomic dimensions from Cambridge Econometrics (CE) (2019). These provided consistent projections out to 2100 for the following priority indicators: Population; Gross Domestic Product (GDP), Gross Value Added (GVA); Employment; Labour productivity (calculated from GVA and employment projections); Land use; and Households occupancy rate. It is noted that this set of data is not a set of UK socioeconomic scenarios and is not aligned to the IPCC Shared Socio-economic Pathways (SSPs)

Example of Shared Socio-economic Pathways for the UK

SSP1-Sustainability. A shift towards sustainability is triggered by natural disasters, the vulnerability of many job sectors, and worsening standards of living that are perceived to be connected to environmental degradation. Local green political networks and initiatives for change emerge, leading to strong support for regionalisation. New legislation integrates green development in lifestyle changes and in the technology, economic and energy sectors. Sustainable agricultural intensification, facilitated by effective “polluter pays” legislation, and international cooperation enable the UK to reduce its impacts from the externalities of agro-food systems. A UK-wide “green race” delivers the policies and technologies that maximise sustainability and is established across countries. Collaboration domestically and internationally plays a key role in the green race, ensuring technologies, ideas and projects are shared to gain mutual benefits. By 2100, the UK becomes a fully functional circular economy.

SSP2-Middle of the Road. Key public services, such as the health and pension sectors, reach a critical point prompting reform through public-private partnerships. Public-private partnerships also push forward technological development and investments in other sectors, such as transport, energy, IT and infrastructure. While the UK continues to enjoy overall economic growth, social inequalities increase and are countered by the introduction of a basic income and new working rights. A series of shocks, such as crop epidemics and severe water shortages, leads to strong policy responses that introduce Payment for Ecosystem Services schemes to address unsustainable food systems, pollution and biodiversity loss. Both urban and rural planning becomes highly regulated.

UK-SSP3-Regional Rivalry. With job losses and barriers to trade, the government lifts EU and UK environmental regulations to allow access to a wider supply of domestic natural resources. The UK increasingly closes its borders and invests in defence. Immigration from European and non-European countries decreases, but internal migration increases because people move around the UK in search of job opportunities which become concentrated in the major cities. The high competition for jobs leads to an exploited workforce with low salaries. With a reduction in personal income and the redistribution of public spending towards the defence sector, health prevention and treatments decrease and death rates from ill health increase. Around 2040, Scotland becomes independent from the UK, with the other nations following quickly afterwards. With increasing socio-economic barriers, conflicts arise, markets shrink and informal economies increase. With high levels of corruption, criminality is widespread across society and criminal bands substitute themselves for former institutions. Across the (former) UK, a return to self-subsistence lifestyles is widespread.

UK- SSP4-Inequality. In order to boost economic growth public support for radical action towards novel development strategies increases. A National Strategy Development Plan is created to foster business and economic opportunities in green energy and technological development through opening up access to land resources. As businesses and technology flourish, peer-to-peer networks for storing and distributing digital information become popular means for businesses to bypass centralised financial regulations and accumulate wealth. Society becomes increasingly polarised and the North South divide widens. The divide is accentuated by the lack of government intervention: the welfare state has been slowly eroded until its end in the 2060s. Lack of a stable income and poor living conditions means that the vast majority live through committing minor crimes, while a small proportion of rich elite control economic and natural resources.

UK-SSP5-Fossil-fuelled Development. Reduced public support for carbon taxation and taxes to finance green transformation of infrastructure, lead to continued demand for cheaper and more readily available fossil fuels. Strong development in domestic manufacturing is supported by the discovery of shale gas, which leads to reduced energy costs. Increasing public investments in shale gas production in northern England heavily contributes to the removal of the North-South divide. The economy increases exponentially and welfare increases. Large increases in population lead to rapidly expanding “city states” and massive urban sprawl. Large-scale environmental degradation is initially masked using technological solutions. However, environmental tipping points are reached by the end of the century ultimately leading to food shortages.



Report prepared by

Dr Nigel Davies, BSc, PhD, FIFST, Dipl Brew, FIBD

Director, Maltdoctor Ltd

E: maltdoctor@maltdoctor.co.uk

W: www.maltdoctor.co.uk

Registered in England: 13279396

Head office: Stowmarket, Suffolk, IP14 1BQ