Crystallise Greenhouse Gas Emissions report – 2024/25

Version 1

Crystallise Ltd

A *CrystalliseCarbon* project

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1 Executive summary

1.1 Our focuses over previous years

This has been the third year of our Crystallise Carbon project. In year one we focussed on producing estimates for our scope 1, 2, and 3 emissions. In year two we updated and extended those models, and considered how to reduce and offset the emissions we have identified. This year we have identified AI use as a potential driver of increased scope 3 emissions for Crystallise, and this will likely drive modelling updates in 2025-2026.

1.2 Our focus over the next year and beyond.

Work so far has identified our largest scope emissions sources (heating, internet use and the embodied emissions of IT equipment) and committed to a carbon offsetting scheme. Going forward, we intend to re-evaluate the options for validated offsetting and carbon capture schemes, as well as updating our internal emissions model to consider the rise in AI use within Crystallise.

2 Statement of intent

2.1 Purpose

This statement sets out our intent to develop an environmental policy for Crystallise. This statement of intent will:

1. Outline the steps we will take to reduce our environmental impact through emissions reduction in line with the company's values and the wider government objectives for Net Zero by 2050.
2. Outline how we will monitor, plan and mitigate changes brought about by climate change that affect employees e.g., increasing temperatures and other weather extremes.

This statement has been endorsed by the company's directors who will be responsible for implementing any actions.

2.2 Our commitments

Even though Crystallise is a small company with relatively low carbon emissions, we recognise the responsibility that every business has to reduce the impact that our activities have on the environment and climate.

Crystallise will commit:

1. To estimate and report carbon emissions across the three scopes as set out in the Greenhouse Gas Protocol Corporate Standard[1] and using recommendations from the Homeworking Emissions White paper[2].
2. To aim for Net Zero status by reducing our carbon emissions where possible and by balancing unavoidable emissions with evidence-based carbon offsetting and/or carbon fixation.
3. To be transparent about our policies to employees and clients, and to continually reflect on how to improve them in line with new literature and data.
4. To monitor the impact that climate change has on employees and to suggest and support solutions where possible.

2.3 Overview of our current impact

We have modelled Crystallise's current impact (as of December 2023) in line with the three scopes described in the GHG Protocol Corporate Standard[1] and these are summarised in Table 1 below. Due to the nature of the business, the scope 1 emissions are zero. The main source of scope 2 emissions are purchased electricity and heat from home working. The main source of scope 3 emissions is travel.

Table 1 – greenhouse gas emissions scopes currently considered as part of Crystallise modelling.

Scope	Definition	Source of emission	Impact
1	Direct emissions from owned or controlled sources	Fuel Combustion	N/A
		Company vehicles	N/A
		Fugitive emissions	N/A
2	Indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company	Purchased electricity	Homeworking workstation + lighting
		Purchased heat	Homeworking heating
		Purchased steam	N/A
3	All other indirect emissions that occur in a company's value chain	Purchased goods and services	Internet usage
		Business travel	Travel to conferences, annealing meetings and other business travel
		Employee commuting	N/A
		Waste disposal	Not considered
		Use of sold products	Embodied emissions (in equipment such as laptops and desks)
		Transportation and distribution	N/A
		Investments	Not considered
		Leased assets and franchises	N/A

2.4 Focus

Our focus for the 2024/25 financial year was:

- To incorporate our Greenhouse Emissions work into a broader Environmental, Social, and Governance (ESG) working group.
- To identify updates needed to our internal emissions model.

2.5 Our future ambitions, key goals, and timelines

In the near-term, Crystallise will seek to continue to encourage amongst its employees a sense of responsibility for reducing our impact on the environment and generally promote greater awareness of environmental issues.

Crystallise will produce an annual report on the company's estimated carbon emissions, reductions and offsets.

In the long-term, Crystallise will aim to replace carbon offsetting through nature-based solutions with carbon capture and storage (CCS). Crystallise acknowledges that the cost of using CCS schemes for mitigation is currently prohibitively high and also is aware of the uncertainty around which methods are effective. However, we also acknowledge that the cost of CCS schemes will fall as markets expand and technologies develop. We will aim to keep up to date with CCS schemes and re-assess our mitigation options as the evidence evolves.

Crystallise also aims to be aware of new evidence on decarbonisation activities. Most of the literature and guidelines for companies focus on physical decarbonisation e.g., reducing carbon emissions from production processes and replacing physical activities with digital ones (remote meetings). However, there is growing evidence on the negative environmental impact of our digital carbon footprint.

2.6 Emissions strategy

In our emissions modelling we have considered scopes 1, 2, and 3, as per the GHG protocol. Although only scope 1 represents direct emissions from Crystallise, considering scopes 2 and 3 allows us to identify the downstream emissions that result from our business decisions and develop strategies to reduce, offset, or capture them.

2.7 Mitigation strategy

The most efficient way to reduce GHG emissions is to avoid creating them in the first place. Therefore, our strategy prioritises reduction over carbon capture.

2.8 Key action schedule

Month/year	Action
June/July 2023	Start emissions reduction strategies Purchase offsetting scheme Continue to gather data on carbon emissions
March/April 2024	Review current offsetting scheme Finalise carbon emission measurements and compare to previous year Review emissions reduction strategy Deliver company report on progress with model development, carbon emission reduction, offsetting and client strategy
April/May 2024	Continue employing existing emission reduction strategies and incorporate new ones Continue using existing offsetting scheme or change to a new one Continue to collect carbon emissions data
June 2025 – March 2026	Update the internal emissions model. Re-research offsetting and carbon capture options.

3 Emissions modelling

The goal of the emissions modelling is to estimate the company emissions from scope 1,2, and 3 sources. This necessarily involves a lot of assumptions and uncertainty. The purpose of this modelling is not to achieve a completely accurate value for our emissions. Instead, the aim is to identify the main contributing activities so we can target reductions interventions, and to get a ball-park estimate for our total emissions in order to inform carbon capture aims.

3.1 An overview of the model structure.

The model is broken into sub-models for each identified source. These are:

- Travel, which is further divided into
    - Conferences
    - Bi-annual company meetings
    - Other
- Homeworking heating
- Homeworking electricity
- Embodied emissions
- Internet use

Note that all of these sources are scopes 2 or 3, i.e. none are direct emissions from owned or controlled sources. This is a result of Crystallise being in the information industry and all employees working remotely.

For travel, estimates are produced using employee travel data and estimates of emissions per mile from the Department for Energy Security and Net Zero.[3] Homeworking emissions are estimated using a basic model produced by EcoAct,[2] with some re-parameterisation to reflect the specifics of Crystallise employees.

Note that some estimates are made on a per employee basis and some at a company level. As the number of employees changed during the year, for simplicity the employee number at the year end was used for aggregate calculates in the former case.

3.2 An overview of the data collection strategy.

Data collection was in the form of staff surveys. Response was not mandatory, and when data was missing this was imputed as best as possible, often using the median value of the known data.

Data was collected on work travel, workstation setup, and homeworking heating.

3.3 Key structural changes from the previous model.

The 2023-24 model included 'other' travel for the first time – i.e. travel that was neither for conferences nor for the biannual meetings.

Also added were a model for the embodied emissions associated with company equipment, and a model of the emissions from internet usage.

3.4 Model results, changes from the previous model

The results of the current model are shown in Figure 1.

Scope	Definition	Area	Sub-model	Emmissions (kgCO2e per employee-year)	Emissions (kgCO2e per company-year)
1	Direct emissions from owned or controlled sources	Fuel combustion	N/A		
		Company vehicles	N/A		
		Fugitive emissions	N/A		
2	Indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company	Purchased electricity	Homeworking workstation & lighting	46	870
		Purchased heat	Homeworking heating	335	6367
		Purchased steam	N/A		
3	All other indirect emissions that occur in a company's value chain	Purchased goods and services	Internet usage	216	4101
		Business travel	Conference travel	97	1841
			Annealing meeting	122	2316
			Other business travel	2	30
		Employee commuting	N/A		
		Waste disposal	Not considered		
		Use of sold products	EmbodiedEmissions	244	4644
		Transportation and distribution (up- and downstream)	N/A		
		Investments	Not considered		
		Leased assets and franchises	N/A		
				total	20,170

Figure 1 - 2023-24 estimates of Crystallise's greenhouse gas emissions from scopes 1,2, and 3

This model has not been updated since the version presented in the last annual report, and more details of the updates involved in producing it can be found there.

3.5 Discussion of major sources of emissions

Homeworking heating remains the single greatest contributor to indirect company emissions. However, our estimates for both internet usage and embodied emissions suggest that these should also be considered major components of Crystallise's indirect emissions. These may also be easier to modify through company policy, for example by increasing the lifetime of equipment used, buying refurbished rather than new equipment, or modifying internet usage.

3.6 Assumptions and limitations

There are many assumptions in the modelling process, and it is intended to identify major contributors rather than allow for direct comparison. A major limitation is the reliance on estimates from self report.

Homeworking electricity usage estimates are based on employee self-report combined with a limited experimental approach to identify the wattage of common appliances.

Homeworking heating estimates rely on a very simple model of UK households published by Ecoact and modified based on staff surveys. They also rely on assumptions about counterfactual cases, where employees would not be working at home. In some cases, e.g. a parent caring for a child, there is no plausible scenario where the child would be home alone.

Travel estimates are based on employee self-report, which are likely to be fairly accurate. Estimates of emissions per mile for transport options are taken from government estimates, and the methodology is not entirely transparent.

Embodied emissions are based on very uncertain estimates by others, along with best-guess predictions of item lifespans.

Internet usage estimates are the most uncertain of all, and are based on a ballparking methodology – simply taking the average of published estimates of others. This does not account for the fact that employee internet use is a subset of their total use, or that employee internet use is likely higher than the global average. It also does not take into account novel computing tasks such as the use of large language models, an activity that has increased massively within Crystallise in recent years. Thus, this value could easily be an order of magnitude out in either direction.

4 Mitigation action taken this year

4.1 What emissions sources did we include or exclude and why?

Crystallise has no direct emissions sources (scope 1), and our indirect sources (scopes 2 and 3) fall under the scope 1 emissions of other companies. However, our ambition is to make ourselves Net Zero without relying on others in our value chain to do the same. We have therefore included all three scopes when considering our mitigation action.

4.2 How did we consider and balance emissions reductions, offsetting, and CCS?

Discussions were had around the best ways to reduce emissions. Most ideas related to reducing the use of homeworking electricity use, for example by turning off equipment when not in use. However, our modelling suggests that even if we reduced this contribution to zero, this would reduce our emissions by less than 5%. Homeworking heating was considered a difficult target, as it would be intrusive for Crystallise to encourage changes in home heating in employees. Work travel was considered an appropriate target for intervention, and conference and biannual travel was evaluated in light of the associated emissions. However, conference attendance is essential to generating contracts, and the bi-annual meeting is already considered by many to be a considerable compromise relative to the benefits that more regular meetings would bring.

In short, Crystallise did not identify any low-hanging fruit for reducing our emissions during 2023-25.

Research was performed into available options for offsetting and CCS. True CCS is a relatively new technology and is both expensive and generally uncertified. For 2023-24 it was decided that Crystallise would pay into a verified carbon offset scheme.

4.3 What action did we take.

A 100 tonne carbon emissions offset credit was purchased from the Climate Fund Portfolio of verified carbon offsetting projects. This was the smallest unit available, and comfortably covers our estimate for Crystallise scope 2 and 3 emissions for 2023-24.

5 Mitigation actions for next year

5.1 What changes are we making and why?

In 2025-26 Crystallise will again investigate CCS options, with an ambition to migrate to this technology from carbon offsetting as soon as the technology is affordable and verified.

In 2025-26 Crystallise will look into other sources of scope 2 and 3 emissions, particular internet and AI use. We will consider an external emissions audit to replace or supplement our internal modelling.

6 Client communications

6.1 How are we communicating our policies to our clients?

This document represents our public-facing communication of our emissions commitments, modelling, and actions. Our ambition is to update this report no less than once annually and make all versions available through our company website.

6.2 How do our policies affect costs to our clients?

The cost of purchased offsets in 2023-24 has not be factored in to costs to our clients.

6.3 What are our plans for the coming year?

In 2025-26 we will consider including in all project proposals an estimate of the offsetting cost associated with the project.

7 References

1. "The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard" (2015) https://ghgprotocol.org/ accessed 26th July 2023

2. Luke Skillett and Lindsay Ventress "Homeworking emissions "A Whitepaper produced by EcoAct (Oct 2020) EcoAct Climate Consultancy | Climate Action. Commercial Sense. (eco-act.com) accessed 26th July 2023

3. https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

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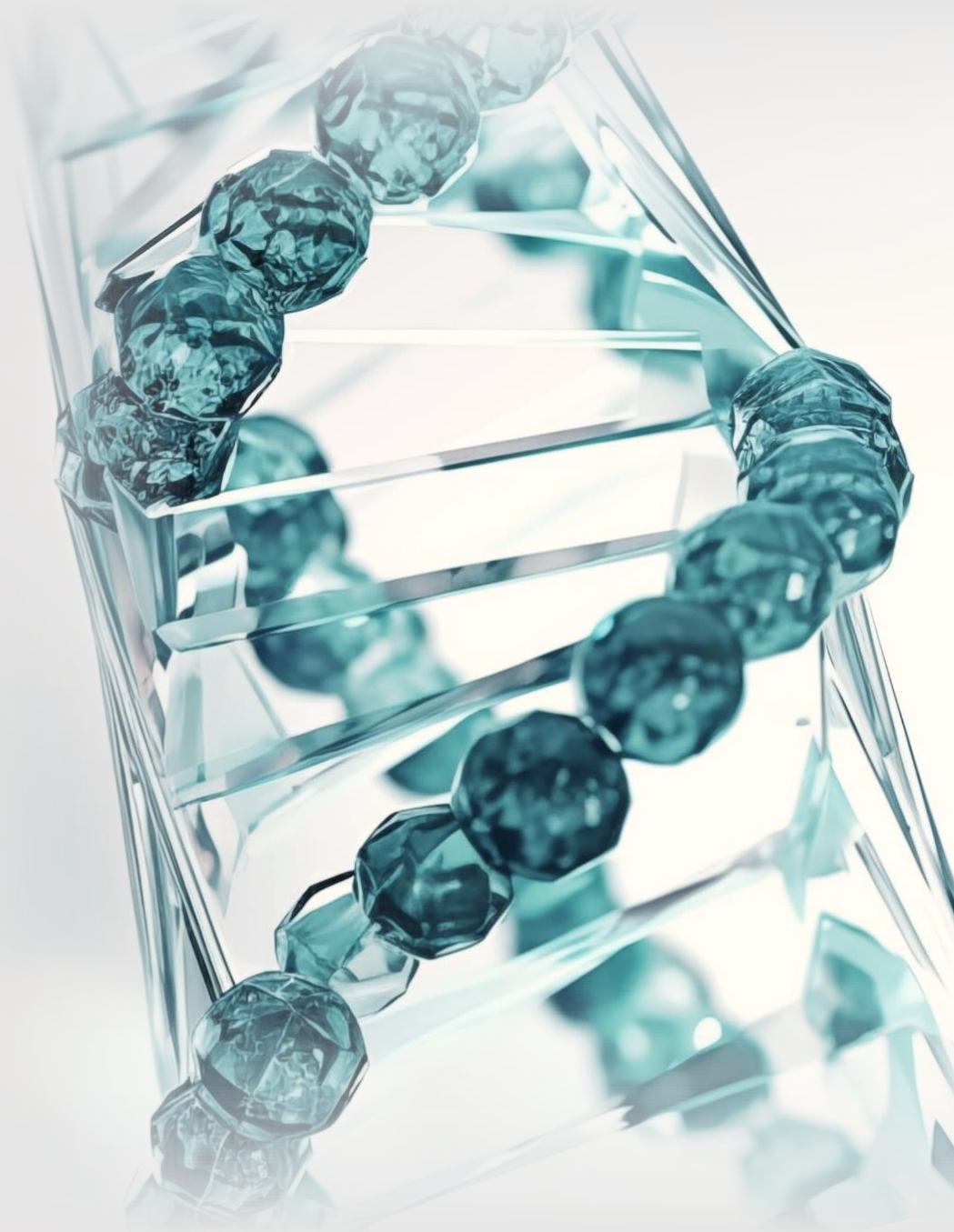

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