Net zero progress report: year 4

November 2025
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This is the fourth annual report tracking greenhouse gas (GHG) emissions for the Royal Society of Chemistry (RSC) since we joined the UN Race To Zero (RTZ) in 2021. It covers our activities from January to December 2024.

Overview

Our sustainability journey

The RSC has a longstanding ambition to help the chemical science community advance sustainability and contribute to the UN's Sustainable Development Goals. We do this in our role as a global publisher and convener of scientific conferences, and by supporting policies aligned with the Paris Agreement and RTZ, advocating for science-led strategies and education reform to address climate change. The RSC engages policymakers on topics like electronic waste, circular economy and sustainable chemicals, and collaborates with other sector organisations and industry to advocate for strategic approaches to sustainable materials management and development[1, 2] . We also work to support the inclusion of sustainable chemistry in curricula and promote green skills in chemical science practices, processes and products (including through our Sustainable Laboratories initiative).

As part of this work, the RSC has committed to actively mitigate our own emissions, halve them by 2030, and achieve net zero operations by 2040.

Headlines

Now in our fourth year of reporting, we can reflect on the progress we have made: curbing our direct emissions, implementing policies on travelling smartly, procuring less, and optimising key business areas such as publishing operations. Compared to both the previous reporting year and our 2019 baseline, we've achieved substantial reductions in the emissions we directly control. The emissions we have less control over (i.e. activity under Scope 3 of the GHG Protocol, which includes emissions from travel and activities along our value chain) have also decreased steadily since 2021, yet they are still above 2019 levels. A contributing factor to this is that reliable Scope 3 emissions data is challenging to obtain from across the value chain, which means that for many of our activities, we rely on financial spend as a proxy for the GHG footprint. This is a methodology that can overestimate emissions as it is sensitive to price inflation. In addition to these methodological limitations, the organisation has undergone changes over this period, as discussed in our annual trustees' reports[3].

The emissions data for 2024 reflects our continued effort to strengthen our methodology and optimise energy use in our buildings. A deeper understanding of our emissions hotspots and levers has helped us identify more targeted mitigation strategies. While an uptick in underlying activity in some emissions categories has meant slight increases in estimated emissions, we were pleased to observe pronounced GHG reductions in several other large areas of activity compared to recent reporting years.

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[1] Our materials strategy action plan. RSC, 2024.
[2] Sustainable polymers in liquid formulations, RSC, 2025.
[3] Trustees' report and financial statements. RSC, 2025.

Key findings for the 2024 accounting period include:

- A 9% reduction in direct GHG emissions from our buildings (Scope 1 and 2) compared with the previous reporting year, corresponding to a 44% reduction compared with the 2019 baseline.
- A 15% reduction in our overall Scope 3 footprint (i.e. including emissions from our business travel, commuting, homeworking, and purchased goods and services) compared to 2023, and a 12% increase compared with the 2019 baseline.
- Within the broader Scope 3 category, a 15% reduction in GHG emissions from the goods and services we procure compared with the previous reporting year.
- A 19% reduction in our overall business travel[4] GHG emissions compared with the previous reporting year, and a 26% reduction due to air travel alone.
- A 56% reduction in GHG emissions linked to paper and printing compared with the previous reporting year, attributable to further changes and streamlining in procurement and production practices.
- A 40% increase in GHG emissions from catering-related activities at our Cambridge and London sites compared with the previous reporting year. This is in part attributable to a change in methodology that one of our main suppliers uses.

Progress to date

How we calculate our GHG emissions

We generate our GHG emissions inventory according to the World Resources Institute Greenhouse Gas Protocol categories and methods. Throughout our calculations, we have used UK Government conversion factors for company reporting of GHG emissions wherever these were applicable to our data. As in previous reports, all RSC staff activity (such as business travel and commuting), as well as emissions from our offices, commercial activity and procurement required to deliver our services lie within the inventory's boundary. Where non-employee travel (such as by our members or scientific editors) is paid for directly by the RSC, it is also covered in the inventory.

Directly controlled sources of emissions – Scopes 1 and 2

Both Scope 1 and Scope 2 emissions can be calculated using direct measurements and location-based conversion factors, and are therefore a good reflection of our GHG footprint in these areas. Table 1 summarises how our Scope 1 and 2 emissions have evolved over the past four years.

Emissions from stationary combustion of the natural gas consumed by our hot water and heating boilers, as well as any fugitive emissions from the freezer and air conditioning units installed in our office buildings, make up our Scope 1 footprint. We have direct control over these emissions and have been able to reduce them significantly for the second year running. We have brought down Scope 2 emissions, which account for our purchased electricity consumption, even further.

[4] This includes all modes of travel (including air and train) for business purposes, but excludes staff commuting to and from work.

Activity type	Greenhouse gas emissions in tonnes of CO_2 equivalents (tCO_2e) 2019	2020	2021	2022	2023	2024
Stationary combustion	79	70	83	86	70	62
Fugitive emissions from air-conditioning and freezers	3	1	115	5	1	1
Scope 1 total	**86**	**71**	**199**	**90**	**71**	**63**
Purchased electricity – location-based	363	263	199	194	180	166
Scope 2 total	**363**	**263**	**199**	**194**	**180**	**166**
Scope 1 + 2 total	**449**	**334**	**398**	**284**	**251**	**229**

Table 1: breakdown of our Scope 1 and Scope 2 GHG emissions since 2019

Taken together, the data shows that we have reduced our direct energy consumption – and with that, our on-site Scope 1 and Scope 2 emissions – by over 40% compared to our 2019 baseline. This success is in large part due to our facilities team's ongoing roll-out of energy-saving strategies, including improvements in the control of heating and lighting, installation of low-energy LEDs across our UK buildings, a focus on minimising out-of-hours consumption, optimised building control at our main office building, defaulting to heat pumps within the ventilation system, and only using gas for hot water, cooking and to top up heating on the coldest days. In addition, a proportion of this reduction can be attributed to a shift to hybrid working over the past five years, and cloud storage solutions replacing our on-site data servers.

Indirect sources of emissions – Scope 3

In addition to accounting for the GHG emissions that are under our direct control, our RTZ commitment requires us to also estimate the intensity of indirect emission sources that comprise our Scope 3 footprint. Under Scope 3, we include emissions across our value chain, such as employee commuting, business travel, waste generation in our buildings, and emissions related to the goods and services we purchase. Table 2 provides a breakdown of these emissions.

Our overall GHG footprint in this category is a combination of CO_2e calculations that are based on financial spend data, actual usage/activity data, and supplier-provided emissions data. The GHG accounting methodology we employ for a given activity type depends on the availability and fidelity of the underlying data sets. However, wherever feasible we try to use the methodology that allows us to calculate the emissions with the greatest level of accuracy, and we review our approaches on a case-by-case basis.

		GHG Protocol Category	Greenhouse gas emissions in tonnes of CO_2 equivalents (tCO_2e) 2019	2020	2021	2022	2023	2024
Scope 3	1	Purchased goods and services	3,980	3,525	3,416	4,047	5,418	4,596
	2	Fuel- and energy-related activities not already covered under Scope 1 and 2 [5]	41	32	32	32	27	25
	3	Waste generated in our buildings	5	4	2	2	3	2
	4	Business travel - air	1,601	420	121	945	2,005	1,479
	5	Business travel - other	205	101	27	227	491	555
	6	Commuting	478	*no data available*		85	106	99
	7	Homeworking	26	*no data available*		242	274	326
		Total	**6,336**	*data incomplete*		**5,580**	**8,324**	**7,082**

Table 2: breakdown of our Scope 3 GHG emissions since 2019

With 7,082 tCO_2e, Scope 3 emissions account for about 97% of our GHG footprint in 2024. Within this broad category, the two largest emissions categories remain the goods and services we procure and our air travel, accounting for 63% and 20% of our overall footprint, respectively.

Compared with the previous reporting year, we estimate that GHG emissions attributable to purchased goods and services are down by 15% overall compared to 2023. Encouragingly, we have observed a 56% reduction in emissions for activities linked to paper and printing – a shift largely attributable to further changes in procurement practices in our publishing business. However, activities related to catering for our staff at both our UK offices and the events we run at our London site have seen a 40% emissions increase, a change which can in part be explained by changes in the methodology used to calculate the emissions share of one of our main suppliers.

While business travel remains a major source of our emissions as an organisation, 2024 has seen a marked reduction compared to 2023. Overall, emissions went down by 19% across all business travel, and by 26% for air travel specifically. This is in part due to changes in our travel policy, including considering the class of air fare and whether journeys can be made by rail instead of air.

We continue to use internally captured HR and IT equipment energy-consumption data to estimate the emissions from our UK staff's commuting and homeworking using the EcoAct methodology. These data are then cross-referenced with insights from a travel survey for staff attending our main UK office in the Cambridge Science Park, with the caveat that survey response rates have been fairly low. The trend of year-on-year increases in emissions from homeworking continued in 2024.

As reported previously, we know that our investment portfolio makes a substantial contribution to our indirect emissions. However, as in previous reports, we have not included a quantitative analysis of our investments since the availability of robust emissions data across the different investment asset classes remains very limited. With this uncertainty in mind, Figure 1 shows our 2024 footprint, indicating the share for which we hold emissions data. While we cannot extrapolate reliably from this subset of assets to the whole investment portfolio, it is likely that the true GHG impact of our investments is markedly larger than the share shown here.

[5] The GHG Protocol defines this Scope 3 category as "emissions related to the production of fuels and energy purchased and consumed by the reporting company" not already covered under Scope 1 and 2, for example upstream emissions of purchased fuel or electricity, and transmission and distribution losses.

ROYAL SOCIETY OF CHEMISTRY

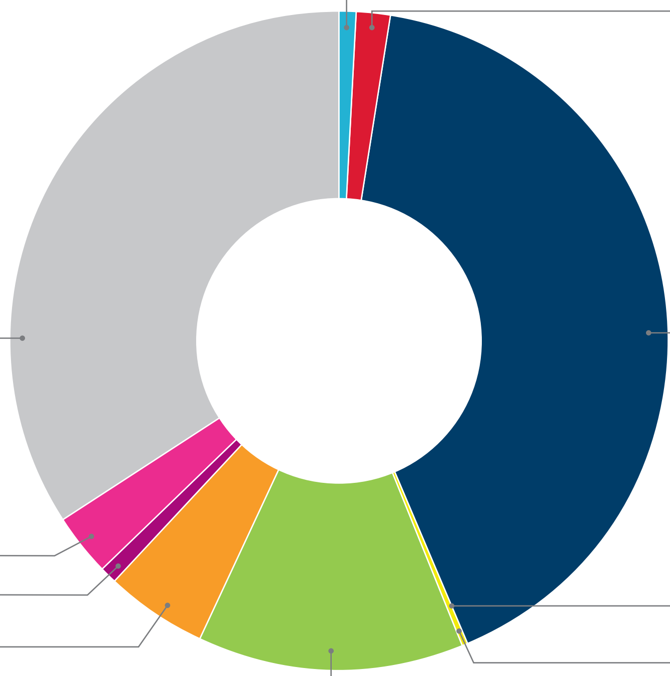

Figure 1: our overall GHG footprint in 2024 by GHG Protocol category

Since we set out on our net zero journey, marked improvements have been made in the granularity and fidelity of the data we receive from our investment managers. We have comprehensive carbon data regarding listed investments, but we continue to receive limited data about alternative investments (infrastructure and hedge funds). We are now in a slightly better position to estimate the true extent of the emissions attributable to the portfolio than at baseline. We continue to engage with our investment managers and advisers to improve the quantitative monitoring of how our portfolio performs in emissions terms to support our decision making on our journey to net zero.

Summary

Table 3 summarises our findings for 2024, and Figure 2 provides an overview of trends for individual GHG Protocol categories. Our estimates indicate that our combined direct and indirect GHG emissions have decreased by 15% compared to the previous reporting period. This translates into an 8% increase relative to our baseline, down from a 25% increase reported in 2023.

	Greenhouse gas emissions in tonnes of CO_2 equivalents (tCO_2e)						*Change against baseline*	*Change since 2023*
	2019	**2020**	**2021**	**2022**	**2023**	**2024**		
Scope 1	86	71	199	90	71	63	*-27%*	*-12%*
Scope 2	363	263	199	194	180	166	*-54%*	*-8%*
Scope 3	6,336	*Data incomplete*		5,580	8,324	7,082	*+12%*	*-15%*
Total	**6,785**	*Data incomplete*		**5,864**	**8,575**	**7,311**	***+8%***	***-15%***

Table 3: summary view of our GHG emissions

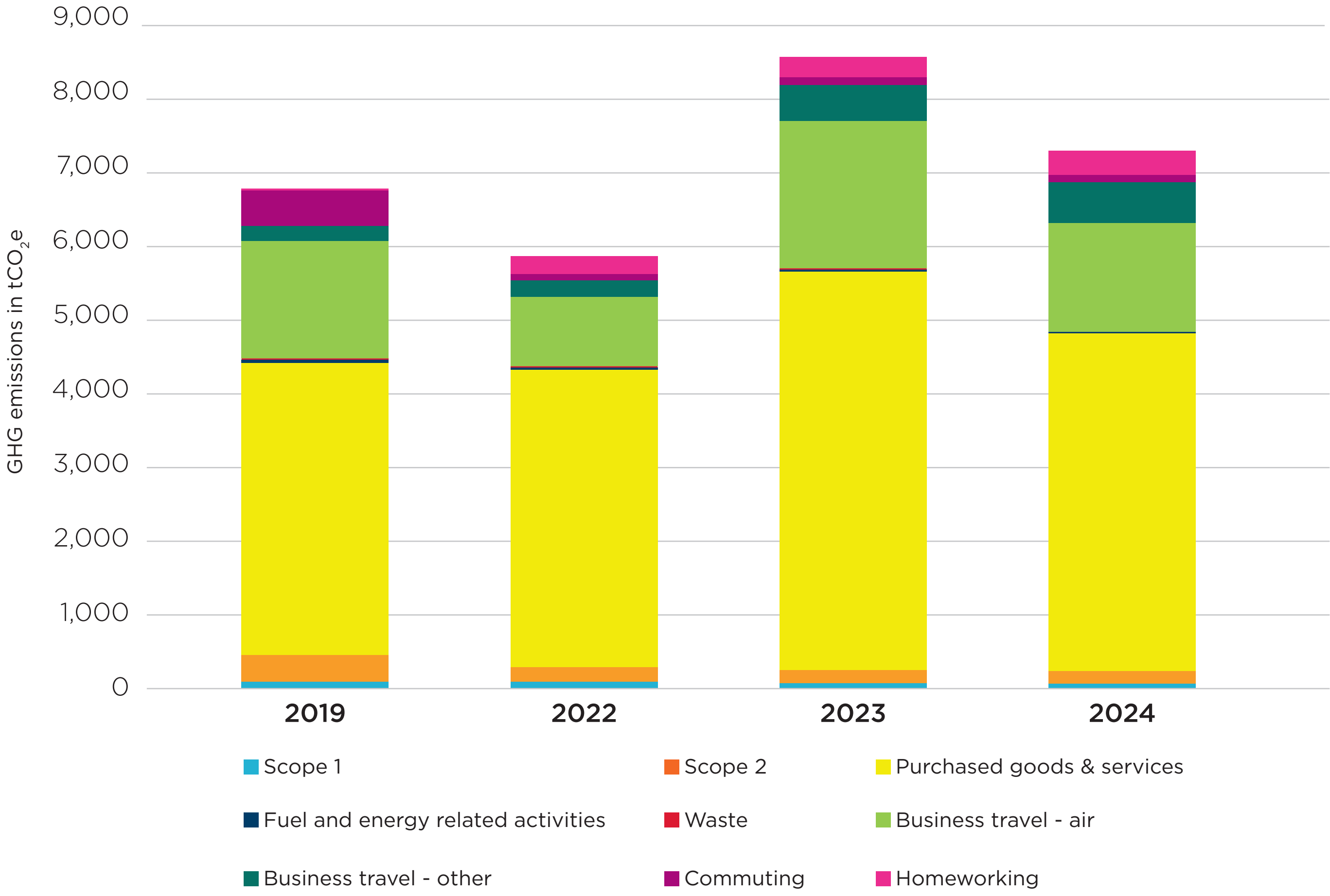

Figure 2: GHG emissions over time by GHG Protocol category

Our Scope 1 and Scope 2 emissions have continued to decline and are significantly lower than at baseline (by 27% and 54%, respectively). While our Scope 3 emissions have reduced by 15% compared to 2023, they are still slightly above the 2019 baseline. This can be attributed to more business travel and purchased goods and services as aspects of the business have undergone change; significantly increased homeworking since the pandemic; and recent price inflation which can lead to overestimations of emission in cases where financial spend is used as a proxy.

Since we set off on our net zero journey in 2019, we have been able to build up a more nuanced picture of the emissions resulting from our operations. More granular and higher quality data across GHG Protocol categories mean that we are now able to consider options as we approach 2030. Over the coming year, a particular focus will be on our emissions hotspots.

ROYAL SOCIETY OF CHEMISTRY

Appendix 1 – Our corporate climate mitigation goal and approach

Targets and reporting frameworks

In July 2021, the RSC announced that it was joining the UN Race To Zero (RTZ) by adopting a comprehensive net zero target of 2040 and committing to report annually on progress towards a 50% reduction by 2030 from a 2019 baseline. Net zero means that emissions and removals of long-lived greenhouse gas emissions to and from the atmosphere are balanced. Globally, this action is required to halt ongoing warming, with the time required to reach net zero determining the extent of climate change.

Our targets align with the Science Based Targets Initiative (SBTI) 1.5°C path and have been agreed with the Pledge to Net Zero, the UK environment sector programme implementing the UN RTZ developed by the Society for the Environment (SocEnv). These targets are equivalent to a 4.6% linear per annum reduction and cover all sources that are material to total carbon footprint and where data are available, including indirect Scope 3 emissions.

We have also signed up to the UN SDG Publishers Compact in 2021, committing to accelerate progress to achieve the Sustainable Development Goals (SDGs) during the Decade of Action (2020-2030), of which Goal 13 is Climate Action. Signatories aspire to develop sustainable practices and act as champions of the SDGs, publishing books and journals, arranging meetings and other initiatives that will help inform, develop and inspire action in that direction.[6]

Carbon offsetting, the use of sinks and credits

Net zero implies the removal of greenhouse gases from the atmosphere to balance emissions. Nature-based solutions to climate change protect and enhance ecological carbon removals, often termed 'sinks'. Projects to chemically sequester carbon dioxide in bulk materials and geological formations are also in development. Offset credits are accounting frameworks to facilitate economic relationships between organisations that cause emissions and those that implement removals.

The RSC will aim to achieve its net zero target without the use of offset credits, taking actions that reduce emissions from our own activities as a priority. We do not intend to purchase offset credits prior to or in respect of our 50% reduction by 2030. Beyond 2030, offset credits may be considered to balance persistent emissions. We will follow the development of carbon removal projects with permanent storage and review this position in future. Where suppliers provide goods or services that include an element of offsetting (e.g. those claiming to be carbon neutral), we will only count them in respect of our targets if they align with the above principles.

[6] The World Resources Institute Greenhouse Gas Protocol (WRI GHG Protocol) categorises greenhouse gas emissions as Scope 1 direct emissions (such as from natural gas combustion), Scope 2 indirect emissions from energy directly consumed (such as grid electricity), and Scope 3 indirect emissions across an organisation's whole value chain (such as from purchased goods and services).