

Shred Station Limited

2021 Greenhouse Gas Assessment

On behalf of Natural Capital Partners

714063R01

JULY 2022





RSK GENERAL NOTES

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1 CARBONNEUTRAL® CERTIFICATION SUMMARY

1.1 CarbonNeutral® Company

Table 1 displays the CarbonNeutral® certification scope and emissions to be offset.

Table 1: CarbonNeutral® Company certification summary

Organisation:		Shred Station Limited				
CarbonNeutral® certification:		CarbonNeutral® Company				
Reporting period:		1st January 2021 to 31st December 2021				
Consolidation approach:		Operational control				
Scope	Emissions source category	Required or recommended	Included ?	tCO ₂ e		
1	Direct emissions from owned, leased or directly controlled stationary sources that use fossil fuels or emit fugitive gases	Required	✓	45.9		
	Direct emissions from owned, leased or directly controlled mobile sources	Required	✓	2001.7		
2	Emissions from the generation of purchased electricity, heat, steam or cooling	Location-based	✓	255.6		
		Market-based		149.3		
3 (up-stream)	Purchased goods and services (e.g., water and consumable supplies)		Recommended	✓	0.1	
	Capital goods	Printers, laptops, computers etc.	Recommended	X	--	
	Fuel and energy related activities	Upstream emissions from purchased fuels		Recommended	X	--
		Upstream emissions from purchased electricity		Recommended	X	--
		Transmission and distribution (T&D) losses		Required	✓	22.6
	Upstream transportation and distribution	Outbound courier deliveries of packages		Recommended	X	--
		Third-party transportation and storage of inbound production-related goods		Recommended	N/A	--
	Waste generated in operations	Wastewater		Recommended	✓	0.2
		Other waste		Required	✓	0.2
	Business travel	All transport by air, public transport, rented/leased vehicle and taxi		Required	✓	2.3

Organisation:		Shred Station Limited			
CarbonNeutral® certification:		CarbonNeutral® Company			
Reporting period:		1st January 2021 to 31st December 2021			
Consolidation approach:		Operational control			
Scope	Emissions source category		Required or recommended	Included ?	tCO ₂ e
		Emissions from hotel accommodation	Recommended	X	--
	Employee commuting	Employee transport between home and places of work	Recommended	X	--
		Emissions arising from employee homeworking and remote work	Required	✓	1.6
3 (down-stream)	Downstream transportation and distribution	Third-party transportation and storage of sold products	Required	N/A	--
		Use of sold products	Recommended	X	--
Overall compliance: location-based scope 2				✓	2,330.2
Overall compliance: market-based scope 2				✓	2,224.0
Overall compliance: market-based scope 2 – minus fleet emissions				✓	222.3
Total for offset (tCO₂e)					223

1.2 CarbonNeutral® Fleet

Table 2 displays the CarbonNeutral® certification scope and emissions to be offset:

Table 2: CarbonNeutral® Fleet Certification Summary

Organisation:	Shred Station Limited		
CarbonNeutral® certification:	CarbonNeutral® Fleet		
Reporting period:	1st January 2021 to 31st December 2021		
Consolidation approach:	Operational control		
Emissions Source Category	Required or Recommended	Included ?	tCO₂e
All direct emissions from mobile sources used to deliver the activity	Required	✓	2,001.7
Emissions from consumption of purchased electricity (including transmission losses) and/or steam used to deliver the activity	Required	N/A	--
Overall compliance		✓	2,001.7
Total for offset (tCO₂e)			2,002

2 CONTEXT

2.1 Why measure greenhouse gas emissions?

Greenhouse gas (GHG) emissions assessments quantify the total GHGs produced directly and indirectly from a business or organisation's activities. GHG assessments may also be conducted for products or services. Also known as a “carbon footprint”, a GHG assessment is an essential tool in the process of monitoring and reducing an organisation's climate change impact as it allows reduction targets to be set and action plans formulated.

GHG assessment results can also allow organisations to be transparent about their climate change impacts through reporting of GHG emissions to customers, shareholders, employees and other stakeholders. Regular assessments allow clients to track their progress in achieving reductions over time and provide evidence to support green claims in external marketing initiatives such as product labelling or Corporate Social Responsibility (CSR) reporting.

2.2 The Kyoto Protocol GHGs

GHG assessments quantify the Kyoto Protocol greenhouse gases, as applicable, and are measured in terms of tonnes carbon dioxide (CO₂) equivalence, or tCO₂e, where equivalence means having the same warming effect (‘global warming potential’, or GWP) as CO₂, typically measured over 100 years (but see Section 2.3 below).

The six original Kyoto Protocol gas groups are CO₂, methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and perfluorocarbons (PFCs); nitrogen trifluoride (NF₃), a chemical released in certain high-tech industries, was added in 2013. The global warming potential (GWP) of each is presented in Table 3.

Table 3: Kyoto Protocol GHGs and their global warming potential (GWP)

Greenhouse gas/group	Chemical formula	GWP (CO ₂ e)
Carbon dioxide	CO ₂	1
Methane	CH ₄	25
Nitrous oxide	N ₂ O	298
Hydrofluorocarbons	HFCs	Depends on specific gas
Sulphur hexafluoride	SF ₆	22,800
Perfluorocarbons	PFCs	Depends on specific gas
Nitrogen Trifluoride	NF ₃	17,200

2.3 Methane's GWP

Methane (CH₄) is the most abundant GHG after CO₂. It has a higher heat-trapping potential than CO₂ but remains in the atmosphere for a shorter period (typically ~12 years). This means that its GWP depends on the reporting timeframe and can lead to ambiguity. When reporting their GHG emissions, an entity can choose to report the 20- or 100-year timeframe multiplier for methane; if the 100-year timeframe is used – as stipulated by the Greenhouse Gas Protocol Corporate Standard – this can underestimate the short-term warming potential considerably. It has therefore been suggested that governments and corporations should report short-lived climate-forcers like methane separately to emissions of longer-lived GHGs to avoid underestimation.

There is also evidence that methane leaks from the oil and gas industry in the USA could be up to 60% higher than official USEPA estimates (Alvarez *et al.*, 2018), which will increase short-term atmospheric methane emissions. Again, this is not reflected in current official emissions factors.

The practical upshot is that the climate mitigation potential for any reductions in natural gas (and to some extent all fossil fuel) consumption may be considerably higher than reflected in figures using official 100-year CO₂e emissions factors.

2.4 Calculating emissions

GHG assessments use client-supplied activity data (e.g., kWh of electricity or litres of fuel used), from which GHG emissions estimates are quantified by applying the most relevant emission factor(s) from published reputable sources (e.g., Defra, the UK's Department for Environment, Food and Rural Affairs).

An emission factor is a representative value that relates the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Emission factors are typically available from government publications, independent agencies, and scientific research journals; however, the quality and accuracy of such factors can vary significantly. Factors can differ depending on the research body and/or underlying methodologies applied. It is therefore good practice to apply emission factors only from reputable sources, such as Defra.

2.5 Reporting standards

GHG assessments are generally carried out in accordance with one of two recognised standards for accounting and reporting corporate GHG emissions. The best-known is the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard" (GHG Protocol, 2011) developed in a partnership of the World Business Council for Sustainable Development (WBCSD) and the World Resource Institute (WRI).

The International Organization for Standardization (ISO) also produced the *ISO14064*¹ specification series, detailing specification and guidance for the organisation and project levels, as well as for the validation and verification of emissions.

The CarbonNeutral® Protocol developed by Natural Capital Partners (NCP) is an additional layer on top of the GHG Protocol and describes the requirements for achieving specific CarbonNeutral® compliant certifications (i.e., CarbonNeutral® 'Company', 'Product', 'Event' etc.).

2.6 Emissions scopes

The aforementioned standards break down emission sources into three distinct categories, known as 'scopes'.

2.6.1 Scope 1

Scope 1 accounts for direct emissions released from sources that are owned or controlled by the reporting company (such as corporate car fleets, power generation facilities, fuel combustion for heating and power, refrigerant gas losses and where applicable process emissions).

2.6.2 Scope 2

Scope 2 accounts for indirect emissions associated with off-site generation of purchased electricity, heat and steam and cooling.

In 2015, the GHG Protocol published its Scope 2 Guidance, an amendment to the Corporate Standard. These guidelines state that any operations in markets providing product- or supplier-specific data in the form of contractual instruments shall report scope 2 emissions in two ways: one based on the location-based method, and one based on the market-based method, with each result labelled according to the respective method. This is also termed 'dual reporting'.

2.6.2.1 *Location-based reporting*

The location-based method reflects the average emissions intensity of grids on which energy consumption occurs. This method applies to all locations where grids are used for the distribution of energy, where electricity demand causes the need for energy generation and distribution. Grid-average emission factors are used, which are based on statistical emissions information and electricity output, aggregated and averaged within a defined geographic boundary and a defined time frame. This includes regional/sub-national grid averages and national production grid averages.

2.6.2.2 *Market-based reporting*

The market-based method reflects proportional emissions from specific electricity tariffs that companies actively select in the market. Under this method of scope 2 accounting, an energy consumer uses the emissions factor associated with the qualifying contractual

¹ 'ISO 14064 – Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals'

instruments it owns. Markets differ as to what contractual instruments are commonly available or used by companies to purchase energy or claim its specific attributes, but can include Energy Attribute Certificates (RECs, GOs, I-RECs), Power Purchase Agreements (PPAs) and green electricity products purchased from energy suppliers.

As per The CarbonNeutral® Protocol, zero emissions may only be awarded when double-counting is avoided. Any businesses seeking to make a scope 2 reporting declaration in support of CarbonNeutral® certification must complete and sign a disclosure form provided by NCP, which outlines the contractual instrument(s) purchased, the total consumption covered (MWh), and the reporting period it applies to.

If a company either does not have any such contracts or its instruments do not meet the quality criteria, then a residual mix factor is applied representing the untracked or unclaimed energy and emissions for that region. If the residual mix is not available, then the location-based method is applied, utilising either regional / sub-national grid averages or national grid averages. In this case, the reported market-based scope 2 total will be the same as the location-based total.

2.6.3 Scope 3

Scope 3 includes all other indirect emissions sources not accounted for within scope 1 and 2. This depends on the company's activities but might include business travel, staff commuting, water consumption, waste disposal, or outsourced activities such as deliveries.

The GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (WRI and WBCSD, 2011) groups scope 3 emissions into 15 distinct categories to provide companies with a framework to organise, understand and report their emissions from wider upstream and downstream impacts.

The GHG Protocol describes the quantification of scope 1 and 2 as mandatory, whereas scope 3 emissions are optional. However, the CarbonNeutral® Protocol requires inclusion of certain scope 3 emissions (typically waste and business travel) depending on the certification targeted. Other scope 3 sources may be included at the discretion of the client.

Depending on the nature and remit of an organisation, scope 3 activities can contribute a significant proportion of overall emissions. To gain a proper understanding of an organisation's GHG emissions it is thus advisable to include all relevant sources.

2.7 Measuring climate impacts from aviation

From 2014, it is a requirement of The CarbonNeutral® Protocol that clients consider the evidence regarding the overall effect of aviation on climate, aside from simply GHG emissions released during combustion of jet fuel including, but not limited to, soot particles and aviation induced clouds. Having considered the evidence, clients may elect to calculate their aviation carbon impact by considering only GHG emissions with a small uplift to account for the wider impacts of aviation (an Aviation Impact Factor (AIF) of 1.4), or alternatively may elect to address the full wider effects of aviation by applying an AIF of 2, or higher.

2.8 Homeworking emissions

From 2020 office working was drastically reduced for many companies as some employees begin working from home. Thus, from 2020 onwards, homeworking emissions must be included within CN Company assessments as a required emissions source. As it not realistic for primary data to be widely available, RSK has benchmarked typical homeworking energy use, accounting for IT, lighting and HVAC (heating, ventilation and air conditioning). This has been applied to contracted and Covid-related homeworking staff.

2.9 GHG accounting principles

RSK's approach to carbon accounting is to follow the GHG Protocol's core principles where possible:

- Relevance: selecting an appropriate inventory boundary that reflects the GHG activities of the company and serves the decision-making needs of users.
- Completeness: accounting for all emission sources within the chosen inventory boundary, with any specific exclusions disclosed and justified.
- Consistency: aiming to collect meaningful and consistent data over time whilst transparently documenting any significant changes to data quality and/or format.
- Transparency: addressing all relevant issues in a coherent and clear manner.
- Accuracy: minimising uncertainty and avoiding systematic over- or under-quantification of emissions, and ensuring any necessary estimates or assumptions required are conservative and guided by industry standards.

2.10 Data quality and accuracy

The accuracy of a GHG assessment is directly related to the quality of the activity data provided. Primary data should be used where available: this represents actual activities during the reporting period (such as metered kWh of electricity consumed).

Secondary data – in the form of estimates, extrapolations and/or industry averages – may be used when primary data is not available. Assessments based largely on secondary data should only be viewed as an estimate of GHG emissions impact, and actual emissions may vary significantly.

Although comprehensive primary data may not always be available for all emissions sources, in general it is good practice to look continually improve the proportion of primary data over time.

3 METHODOLOGY

3.1 Introduction

This GHG assessment has been prepared by RSK, on behalf of NCP, to estimate GHG emissions associated with the operations of Shred Station Limited during the reporting period 1st January 2021 to 31st December 2021. Shred Station Limited provides secure confidential waste destruction and disposal services and employs 122 full-time equivalent (FTE) staff across three sites (Norwich, Harlow and Denton), including a number of home workers and fleet drivers. Table 4 displays a breakdown of the office locations assessed within this report:

Table 4: Office locations

Office location	Floor area (m ²)	Staff
Norwich	4,267	32
Harlow	3,048	12
Denton	4,145	5
Homeworkers	--	7
Drivers and drivers' mates	--	66
Total	11,460	122

3.2 Approach

On project commencement, RSK completed a quality assurance form to review all activity data provided by the client, with conservative assumptions proposed where necessary to ensure a best practice approach was adhered to.

GHG emissions were then quantified by applying the most relevant emission factors. GHG emission factors relating to the 2021 reporting year are predominantly sourced from the Defra and BEIS 2021 *UK Government GHG Conversion Factors for Company Reporting* (July 2021). See **Appendix A** for details of all GHG emissions factors used in this assessment.

Results within the tables of this report are accurate to the number of significant figures presented. Therefore, any inconsistencies in totals versus individual values are due to rounding and should not be viewed as erroneous.

3.3 Operational boundary and data quality

Table 5 displays the operational boundary applied for this assessment along with an overview of the quality of data provided by the client. The total quantity of primary data used for this assessment amounts to 99%.

Table 5: Operational boundary and data quality

Scope	Emissions source	Requirement	Data provided and quality	Suggested action
1	Refrigerant gas losses	Required	< Primary data provided for one site, remaining two sites estimated	Request data from building managers in terms of kg refrigerant gas recharge
	Stationary sources	Required	< Mains gas estimated for site	Review onsite meter readings or extract from billing (m ³ or kWh)
	Mobile sources	Required	< Primary data available in terms of litres (diesel) and miles travelled (diesel and petrol-vehicles)	-
2	Electricity consumption	Required	< Primary data provided in terms of kWh of energy consumed	-
3	Water	Recommended	< Primary data provided for water consumption for two sites, water usage for one site was estimated	Request data from building managers in terms of m ³
	T&D losses ²	Required		
	Upstream electricity (WTT ³)	Recommended	< See electricity consumption	N/A
	Wastewater	Recommended	< Primary data provided for wastewater for two sites, and estimated for the third site	Request data from building managers in terms of m ³

² Transmission and Distribution (T&D) losses refer to the scope 3 emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it).

³ Well-to-Tank (WTT) emissions refer to the impact of the extraction, refining and transportation of primary fuels before their use in the generation of electricity.

	Waste	Required	< Primary data provided in terms of volume capacity and weight for composted, recycled, and landfill waste. Incinerated waste data provided in terms of number of bin bags	-
	Business travel	Required	< Primary data provided in terms of mileage for taxis, and secondary data provided in terms of estimated mileage for petrol cars for business use	Aim to collect primary data within expenses claims
	Hotel stays	Recommended	< Not applicable	N/A
	Staff commuting	Recommended	< Not applicable	N/A
	Outbound courier deliveries of packages	Recommended	< Not applicable	N/A
	Third party distribution and storage of inbound production-related goods	Recommended	< Not applicable	N/A
	Third party transportation of outbound final products	Required	< Not applicable	N/A
	Homeworking	Required	< Primary data provided	-
Assessment emissions based on primary data			99%	

3.4 Key assumptions

Upon completion of the quality assurance phase, the following assumptions were agreed with the client:

- Where data was unavailable for refrigerant gas losses, data has been assumed based on the following: 0.0125 tonne air conditioning (AC) unit per m², with a 2.27kg refrigerant gas charge per tonne AC weight and a 3% annual leakage, as per the Screening Method set out Defra's 2020 reporting guidelines. Shred Station's AC unit was classed as a small unit for the purposes of this assessment.
- Due to a lack of detailed information, all car journeys have been assumed as 'average car size'. HGV assumed to be HGV rigid, 'average laden'.
- Incinerated, recycled and composted waste streams are assumed to comprise 'average commercial waste'.

- Office waste has been assumed to be 5kg per bin bag. Where shredded paper waste has been provided in litres, a waste density factor of 76 kg/m³ (US EPA, 2016) was applied for shredded paper (assumed not compacted/baled). Compost waste was assumed to have a waste density factor of 0.26 kg waste/litre waste (EA, 2014).
- Shred station provided water consumption estimate for the Harlow site of 23 m³ per person per year (using average data from the Norwich and Denton sites). Similarly, wastewater treatment was estimated for Harlow of 20 m³ per person per year.
- Personal car mileage (for business travel) was estimated to be approximately 10% of the total fuel mileage reclaimed on expenses for predominantly company owned cars.

4 RESULTS

4.1 GHG emissions summary

Table 6 shows total GHG emissions estimated during the reporting year, together with emissions displayed using metrics related to company activities. Absolute GHG emissions can vary over time and often correspond to the expansion or contraction of an organisation. It is therefore useful to use reporting metrics that take these effects into account to establish emissions intensity. Common emissions intensity metrics include tCO₂e per £m turnover, per FTE staff, or per square metre floor area (m²).

Table 6: 2021 GHG emissions summary

Metric	GHG emissions (tCO ₂ e)
Total GHG emissions (market)	2,224.0
<i>Total GHG emissions (location)</i>	2,330.2
GHG emissions per FTE (122) (market)	18.2
GHG emissions per sqm floor area (11,460 m ²) (market)	0.194

4.2 GHG emissions by scope

Table 7 and Figure 1 present GHG emissions by scope estimated for company activities.

Table 7: 2021 GHG market emissions by scope

Emissions scope	GHG emissions (tCO ₂ e)
Scope 1 – Direct emissions	2,047.6
Scope 2 – Indirect electricity emissions	149.3
Scope 3 – Other indirect emissions	27.1
Total	2,224.0

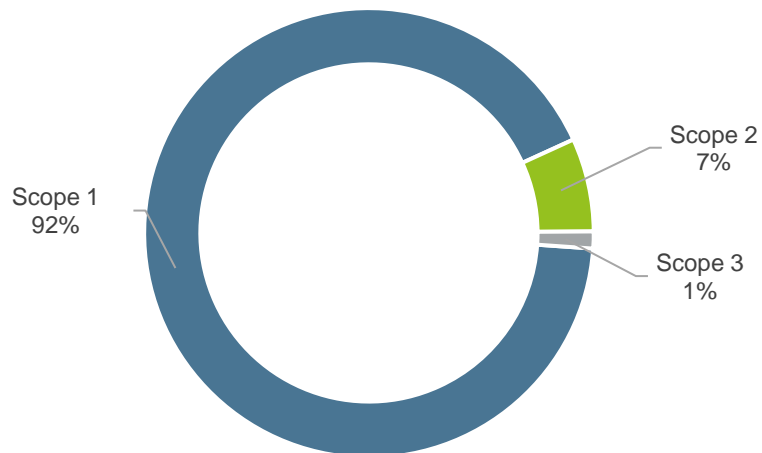


Figure 1. Market-based GHG emissions by scope (tCO₂e)

Scope 1 (direct emissions) represents by far the largest emissions scope (approximately 92%), predominantly from fleet vehicles, followed by scope 2 emissions (approximately 7%) from mains electricity consumption. Scope 3 (other indirect emissions) accounts for the remaining 1% of the carbon footprint.

4.3 GHG emissions by source category

Table 8 and Figure 2 present GHG emissions by source relating to company activities.

Table 8: 2021 GHG market emissions by source category

Activity	GHG emissions (tCO ₂ e)	Sub-total (tCO ₂ e)
Premises		
Refrigerant gas losses	44.3	218.3
Mains Gas	1.6	
Electricity, incl. T&D and WTT	171.9	
Water and wastewater	0.3	
Waste	0.2	
Business travel		
Taxi	0.9	2.3
Car	1.5	
Company Vehicles		
Car	16.2	2001.7
Lorry	1,985.5	
Homeworking		
Homeworking	1.6	1.6
Total		2,224.0

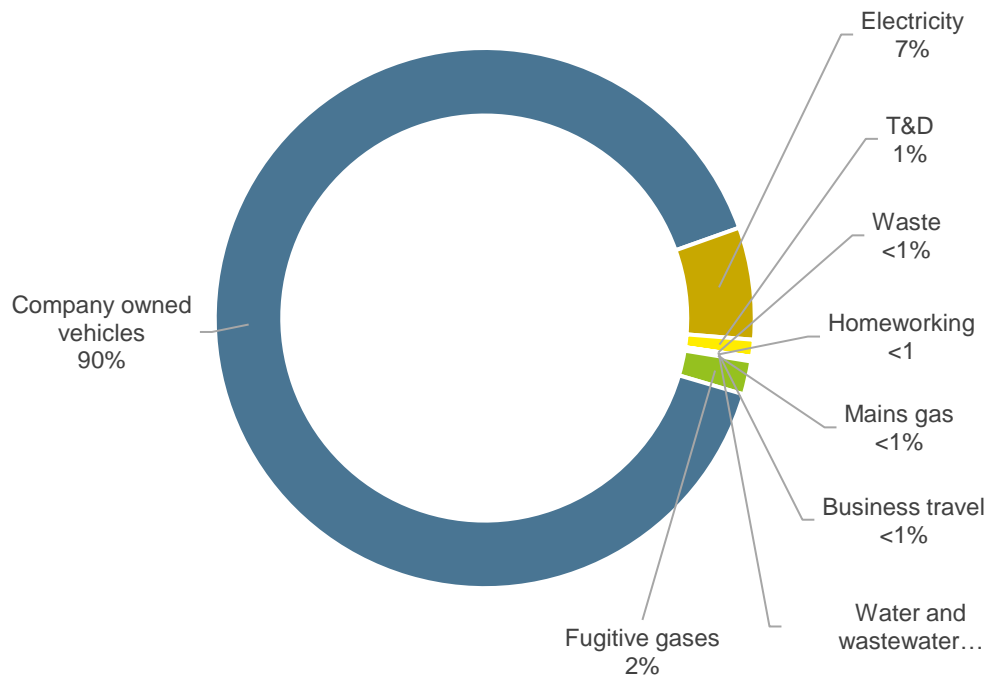


Figure 2. CarbonNeutral@ Company market-based GHG emissions by source (tCO_{2e})

Regarding emissions sources, Shred Stations' fleet vehicles (company owned vehicles) are the largest source (approximately 90%), followed by electricity consumption (approximately 7%) and associated T&D emissions (approximately 1%) and fugitive emissions (2%). Emissions from homeworking, mains gas consumption, business travel, waste, water and wastewater account for less than 1% each of the overall footprint.

4.4 Comparison of 2020 & 2021 GHG emissions

A comparison of GHG emissions from their current (2021) and previous (2020) GHG assessments is provided in Table 9. Overall, there has been an increase in total emissions between 2020 and 2021 of 424 tCO₂e, due predominantly to the increase in emissions from company owned cars. The purchase of some renewable electricity, as well as the use of solar power, has likely contributed to reduced emissions associated with electricity consumption.

Table 9: Comparison of 2020 & 2021 GHG emissions

Emissions source category	GHG emissions (tCO ₂ e)			
	2020	2021	Change	Change
Refrigerant gases	0.0	44.3	+ 44.3	--
Mains Gas	-	1.6	+ 1.6	--
Electricity incl. T&D	242.0	171.9	- 70.1	- 29%
Water & wastewater	1.1	0.3	- 0.8	- 70%
Waste	0.1	0.2	+ 0.1	74%
Business travel	25.3	2.3	- 23.0	- 91%
Company Owned Vehicles	1,529.8	2,001.7	+ 471.9	31%
Homeworkers	1.4	1.6	+ 0.2	16%
Total	1,799.7	2,224.0	+ 424.3	24%
Emissions per FTE staff	15.8	18.2	+ 2.4	15%
Emissions per sqm floor area	0.2	0.19	-0.01	-3%

4.5 Impact of COVID-19

Due to the impacts of the Coronavirus pandemic, Shred Station likely experienced a decline in business travel emissions 2021 reporting period. It is likely that the 2022 reporting year will also be affected, and therefore these years may represent an anomaly from the baseline assessment. An opportunity has arisen from the pandemic in the way businesses can communicate remotely, and measures could be taken to prevent emissions from business travel increasing significantly again.

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APPENDIX A: APPLIED EMISSION FACTORS

Table 10: Applied emission factors

Emissions source	Notes	Factor	Unit	Reference
Refrigerant gas	R410A	2,088	kgCO ₂ e/kWh	Defra 2021
Electricity	UK (location)	0.21233	kgCO ₂ e/kWh	Defra 2021
	UK T&D losses	0.01879	kgCO ₂ e/kWh	Defra 2021
	Npower (market)	0.277	kgCO ₂ e/kWh	Npower 2022
	British Gas (market)	0	kgCO ₂ e/kWh	British Gas 2022
Mains gas	Natural gas	2.02135	kgCO ₂ e/m ³	Defra 2021
Water consumption	Water supply	0.149	kgCO ₂ e/m ³	Defra 2021
Wastewater	Water treatment	0.272	kgCO ₂ e/m ³	Defra 2021
Waste	Industrial & commercial, recycled (closed- loop)	21.294	kgCO ₂ e/t	Defra 2021
	Industrial & commercial, composting	8.951	kgCO ₂ e/t	Defra 2021
	Industrial & commercial, combustion	21.294	kgCO ₂ e/t	Defra 2021
Company Owned Vehicles	Diesel (average biofuel blend) (lorry use)	2.51233	kgCO ₂ e/litres	Defra 2021
	Car, diesel	0.27108	kgCO ₂ e/miles	Defra 2021
	Car, petrol	0.28053	kgCO ₂ e/miles	Defra 2021
Business Travel	Regular taxi	0.20826	kgCO ₂ e/km	Defra 2021
	Car, petrol	0.28053	kgCO ₂ e/miles	Defra 2021
Homeworking	-	1.03	kgCO ₂ e/day	RSK 2021
<p>Notes Defra 2021 = UK Government GHG Conversion Factors for Company Reporting, Defra/BEIS, 2021 pkm = passenger kilometre AIF = aviation impact factor</p>				