



AIM ALFEN
INTEGRATED
MANAGEMENT
SYSTEM

Carbon Footprint Report 2023

**GHG emissions resulting from internal
operations (verified)**

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1 Introduction

This annual report of Alfen N.V. (hereafter "Alfen" or "the Company") provides an overview of the Carbon dioxide (CO₂) emissions inventory for Alfen's activities in 2023.

This report is part of Alfen's integrated Energy management system and has been prepared in accordance with the requirements of the ISO 50001 standard for Energy Management systems [201], The SCCM certification standard CO₂ reduction management with ISO 14001 [202], version 3.1 of the CO₂ Performance Ladder [204], the Green House Gas (GHG) protocol [205] and the international standard ISO 14064-1 for greenhouse gases [206]. This report contains all subjects from section 9.3.1 of the ISO 14064-1: 2018. The emission factors used are included in Appendix B.

Alfen is committed to be a sustainable company without unacceptable risks during the execution of its activities. Therefore, Alfen is constantly looking for opportunities to conduct these activities in both an energy consumption and CO₂ reducing manner as well as in an environmentally friendly manner, hereby striving for continuous improvement therein. This ambition is stated in Alfen's Environmental Management Policy Statement [102].

Periodic reporting on Carbon dioxide emissions and improving the energy performance is part of the Plan-Do-Check-Act (PDCA) cycle. The PDCA cycle is described in the Alfen Integrated Management system (AIM).

The emitting activities covered by the report include all direct emissions in Scope 1 indirect emissions in Scope 2 and indirect emissions related to business travel in Scope 3 which is in line with the CO₂ performance Ladder handbook 3.1.

Excluded are the emissions related to the rental of offices in a multi-company building, since this building is not controlled by Alfen, and the energy use is not metered separately. This energy use is included under other Scope 3 emissions.

Direct emissions (Scope 1) are emissions emitted by installations that are owned or controlled by Alfen, such as emissions from own gas heating systems and vehicle fleet and equipment with fossil fuel consumption.

Indirect emissions are a consequence of the activities of the company but originate from sources that are not owned and not managed by the company. Within Alfen reported indirect emissions are associated with electricity consumption by company facilities and vehicles (Scope 2) and emissions resulting from business travel (Scope 3). The latter concerns category 6 of the Corporate Value Chain (Scope 3) Accounting and reporting standard of the GHG protocol [207].

Figure 1 visualizes the GHG emissions that may be related to the company in a Scope diagram with categorization.

This report discusses the total Carbon footprint on reported Scopes (chapter 5), details on CO₂ emissions per function in Scope 1 (chapter 6), Scope 2 (chapter 7) and business travel in Scope 3 (chapter 8), concluding with a trend analysis on the reporting period in chapter 9.

Additionally, this report provides in chapter 10 a brief update on the progress of the CO₂ reduction plan and in chapter 11 the conclusions and follow-up. An overview of methodology and data quality is provided in chapter 12.

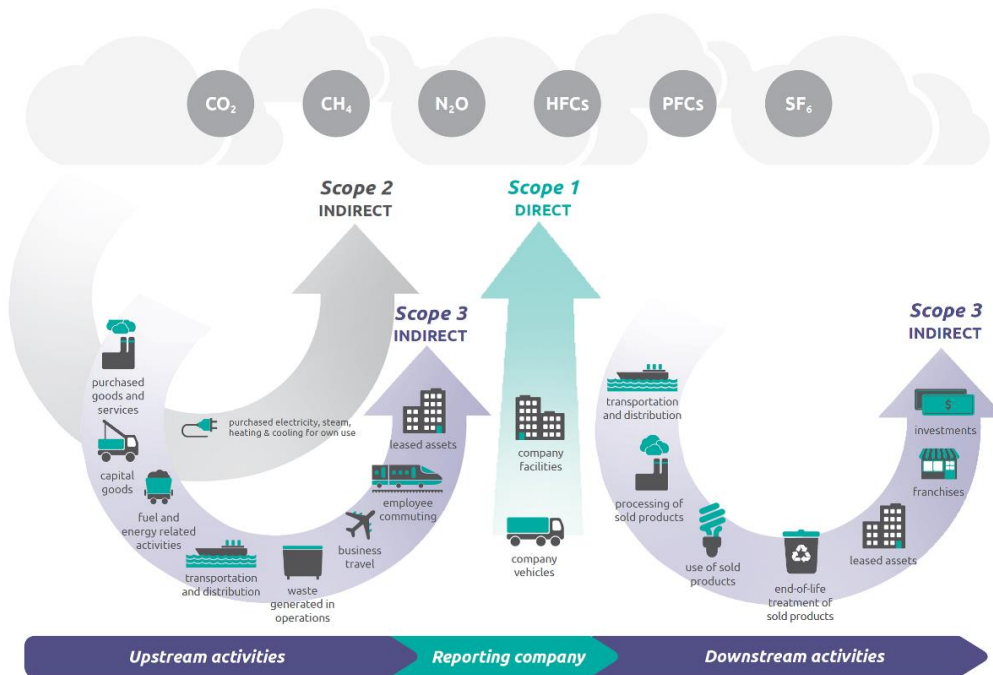


Figure 1 - Green House Gas Footprint Scope diagram [207]

In January 2023, the Corporate Sustainability Reporting Directive (CSRD) came into force. From 2024 and onwards Alfen will report on the GHG footprint under this non-financial disclosure regime on Environment, Social and Governmental topics. Therefore this carbon footprint report is the latest reporting according the voluntarily Dutch CO₂ Performance scheme.

While making the switch from the terminology of the CO₂ performance Ladder [204] to the terminology of the GHG Protocol [205]. This document also concerns the GHG footprint report. Terms “GHG”, “carbon” and “CO₂” are used interchangeably.

Executive summary - Environmental performance and key highlights

Alfen's vision is 'A connected, smart, and sustainable energy system for future generations'. To deliver this, our mission is to boost the energy transition by engineering, manufacturing, integrating, and connecting high quality energy solutions that are innovative, reliable and smart.

We have full insight into our own carbon footprint for years and aim to better understand the carbon footprint in the value chain. As part of the assessment of our energy and CO₂ performance, Alfen is certified according to the Energy Management Systems Standard ISO 50001 [201] and the SCCM certification standard CO₂ reduction management with ISO 14001 [202] and reports its carbon footprint according to the CO₂ Performance Ladder handbook [204].

For 2023 the intermediate objective was set to achieve lower CO₂ emissions per FTE in comparison with base year 2019, despite the expected growth of the company in personnel, production quantities and production area. This objective has been set for Scope 1, Scope 2 and business travel in Scope 3. The rationale for this intermediate objective is vested in the implementation of the new Corporate Sustainability Reporting Directive (CSRD).

In the past period various energy and CO₂ reduction measures for buildings and mobility have been taken to reduce our CO₂ footprint. Thanks to the energy reduction measures within the buildings, we were able to further reduce CO₂ emissions of separate buildings. However no overall reduction in energy consumption for buildings has been achieved. Reason for this is the acquisition of an additional energy-intensive building to expand the production of our products enabling the energy transition. Related to mobility a reduction could be achieved thanks to the further increase in the share of fully or hybrid electrical vehicles to 64% in 2023.

All efforts resulted in a reduction of the absolute CO₂ emissions with 17% compared with base year 2019 for the overall reported Scopes, as well as the overall CO₂ emissions per average Full Time Equivalent (FTE) with 59%, even while the business increased with 350% in revenue growth. Therefore, we have achieved our objectives for the year 2023.

We are committed to continue to further improve our sustainability performance as we transition towards a truly sustainable society for future generations. As such, and as part of CSRD, we performed a re-examination of Scope 3 GHG emissions which has given more insight into significant GHG emissions and improvement area's and submitted short- and long-term science-based reduction targets for our scope 1, 2 and 3 GHG emissions in line with the Science Based Target initiative (SBTi). When accepted these will be published and reported upon.

For more information on Alfen's actions related to the new CSRD legislation reference is made to the financial report 2023.

Marco Roeleveld,
CEO of Alfen N.V.

2 Abbreviations & Definitions

2.1 Abbreviations

Abbreviation	Description
AIM	Alfen Integrated Management system
CO ₂	Carbon dioxide
COP	Conference Of the Parties
CSRD	Corporate Sustainability Reporting Directive
EV	Electric Vehicle
FTE	Full Time Equivalent
GHG	Green House Gas
HVO	Hydrotreated Vegetable Oil
ISO	International Organization for Standardization
PDCA	Plan-Do-Check-Act
PHEV	Plug-in Hybrid Electric Vehicle.
R&D	Research & Development
SBT	Science Based Targets
Scope 3 BT	Scope 3 Business Travel

Table 1 - Abbreviations

2.2 Definitions

Definition	Description
Carbon footprint	The greenhouse gas emissions associated with the activities of an entity or individual.
Direct emissions	Emissions emitted by installations that are owned or controlled by Alfen.
Indirect emissions	Emissions that are a consequence of Alfen’s activities but occur at sources owned or controlled by another company.
Paris Agreement	Legally binding international treaty on climate change was adopted by 196 Parties at COP 21 in Paris, on 12 December 2015 and entered into force on 4 November 2016.
PDCA steering cycle	An iterative four-step management method used in business for the control and continuous improvement of processes and products.
Science Based Target (SBT)	Clearly defined path to reduce GHG emissions in line with the Paris Agreement goals, limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.
Smart Trackers	Software application for CO ₂ emission measurements and assessments.

Table 2 - Definitions

3 References

3.1 AIM Documents

Ref.	Document Title	AIM Document Number	External Document Number
[101]	Alfen Boundary 2018	AIM-QHSE-GEN-1.00-01-MA-03	
[102]	Environmental Policy Statement	AIM-QHSE-GEN-2.01-01-POL-08	
[103]	QHSE Policy Statement	AIM-QHSE-GEN-2.02-02-POL-01	
[104]	Scope 3 GHG emissions 2023 screening	AIM-QHSE-GEN-0.00-01-MA-04	

Table 3 - AIM Documents

3.2 External Documents

Ref.	Document Title	Alfen Document Number	External Document Number
[201]	Energy management systems – Requirements with guidance for use		EN ISO 50001: 2018
[202]	SCCM “Certification scheme CO ₂ reduction management with ISO14001”		N170216, Corr4
[203]	Environmental management systems		ISO 14001: 2015
[204]	CO ₂ Performance Ladder handbook		Version 3.1
[205]	GHG Protocol		2011
[206]	Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals		ISO 14064-1: 2018
[207]	GHG Protocol - Corporate Value Chain (Scope 3) Accounting and Reporting Standard		2011
[208]	“Praktijkverbruik”		Travelcard: www.werkelijkverbruik.nl

Table 4 - External Documents

4 The organization

Alfen is a fast-growing company in the energy sector whose main activity is the design, production and supply of products and services related to the electricity grid, including smart grid solutions, charging equipment for electrical vehicles and energy storage systems.

Alfen sells products and services in more than 30 countries across Europe and also beyond Europe. The production facilities are located in the Netherlands, Belgium and Finland. In 2023, an average of 942 employees worked at Alfen.

4.1 Organizational boundaries

Alfen's organizational boundary [101] has been determined according to the principle of Operational Control, as specified in the GHG protocol [205]. This means that the company reports the emissions from operations over which it has financial or operational control.

Using this approach, this Carbon Footprint Report includes emissions from the following operations:

- Alfen N.V., which covers:
 - Alfen B.V., Almere
 - Alfen BVBA, Gent
 - Alfen ICU B.V., Almere
 - Alfen Projects B.V., Almere
 - Alfen International B.V.
 - Alfen Elkamo Oy

There are no projects with award advantage, therefore no information about projects is included in this carbon footprint report.

Organizational changes

The Company grew from 893 FTEs at 31 December 2022 to 931 FTEs at 31 December 2023.

There is no change in the legal boundaries compared with the period 2019-2022.

Additional acquired or rented buildings are included in the reporting boundary.

4.2 Reporting organization

Alfen N.V.
Hefbrugweg 79
1332 AM Almere

Tel.: +3136 549 3400
E-mail: qhse@alfen.com

4.3 Responsible person

The responsible person for the Carbon Footprint Report 2023 is Mr. M. Roeleveld, CEO of Alfen N.V.

4.4 Reporting period

The reporting period covers January 01, 2023 until December 31, 2023, with base year 2019.

4.5 Verification

Activity data and conversion factors used for the CO₂ footprint calculation have verified by an external party.

5 Carbon footprint 2023

The Carbon footprint of Alfen includes all emissions in Scope 1, Scope 2 and business travel in Scope 3. The latter relates to Scope 3 CO₂ emissions in category 6 of the Corporate Value Chain Accounting and reporting Standard [207]. For Scope 2 the market based approach is used.

In 2023 Alfen's total emissions are equivalent to 1,230 tCO₂e. A breakdown is given in Figure 2. In GHG reporting, often a total value for the Scope 1 and 2 emissions is used. In 2023 these emissions are equivalent to 987 tCO₂e.

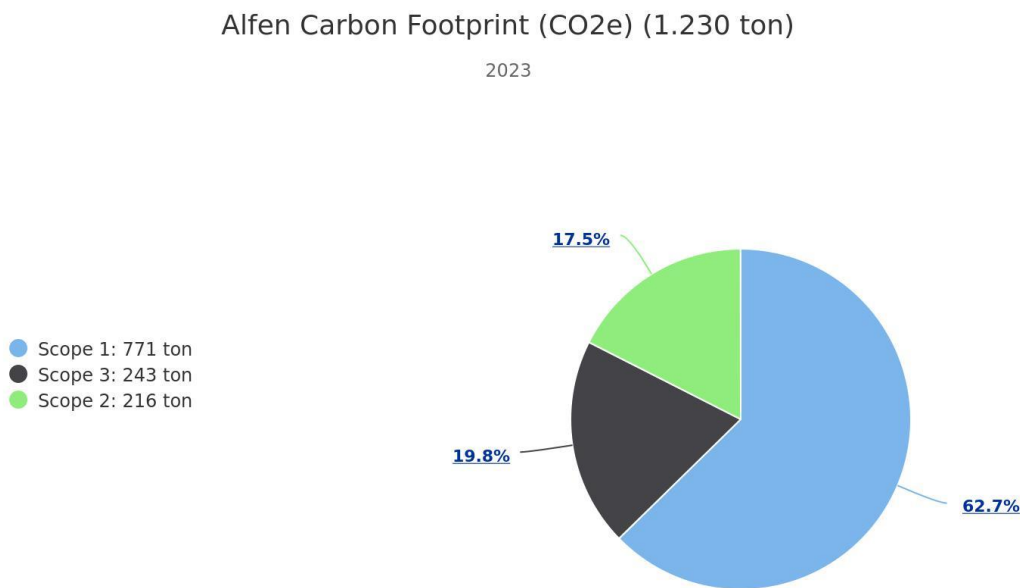


Figure 2 - Alfen Carbon Footprint 2023

Since 2018 there has been an increasing growth of the business, number of production sites and number of employees. This also resulted in growth of the total CO₂ emissions. This is visualized in Figure 3.

As a result of the COVID-19 pandemic and related measures, in 2020 and 2021 a break in this trend is observed. This is mainly related to the changes in mobility as a result of working from home and restrictions for (international) travel.

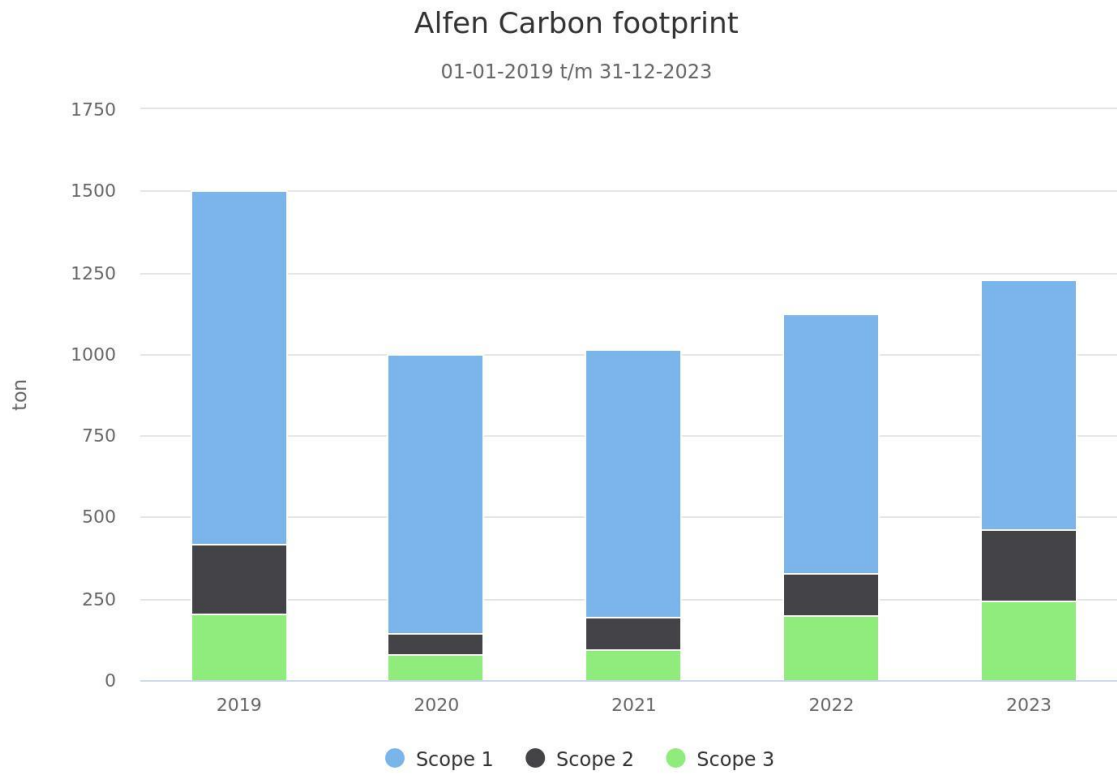


Figure 3 - Alfen Carbon Footprint 2019-2023

Comparison of the carbon footprint in 2023 with the footprint in base year 2019 demonstrates a 17% decrease. Over the same period, the business revenue increased with 350%.

Figure 9 in chapter 8 visualizes the trend in absolute CO₂ emissions related to function since base year 2019.

6 Scope 1 - Direct CO₂ Emissions

The direct emissions in Scope 1 are a product of fuel powered lease cars (company-owned vehicles), heating, stationary equipment, use of self-generated electricity and eventual refrigerant leaks.

In 2023, direct emissions accounted for 771 tonnes of the CO₂ emitted by Alfen, a quantity of 63% of the total reported GHG emissions. This is a 28% decrease in comparison with base year 2019 and also a decrease compared to 2022. Main reason for the decrease is the lower natural gas consumption for heating and the fuel consumption for lease cars.

A breakdown for Scope 1 is given in Figure 4 and the different functions are successively explained in more detail in the following sections. Chapter 9 provides information on the trend in recent years.

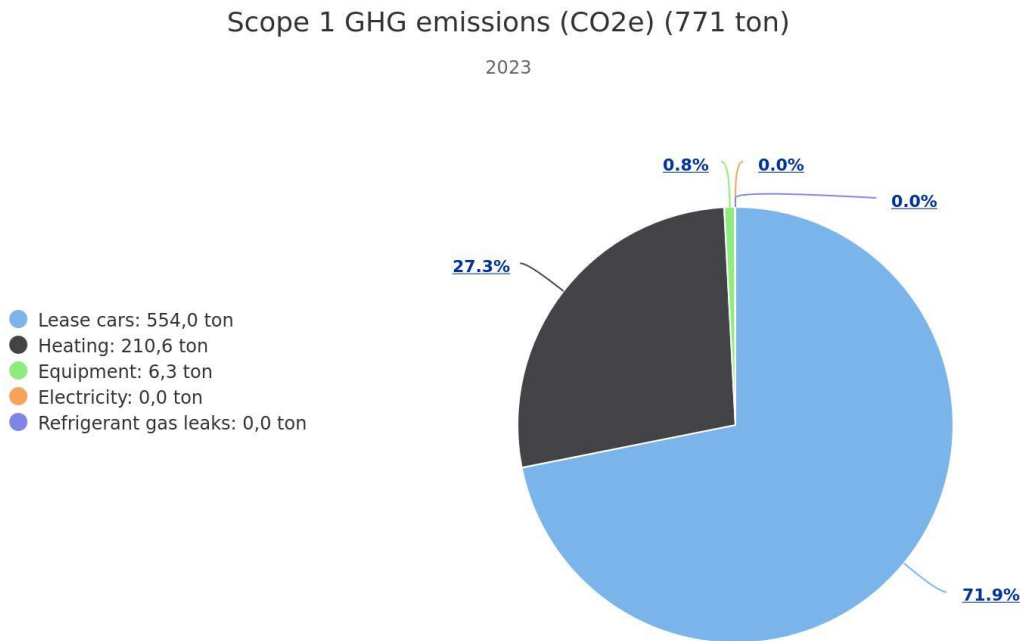


Figure 4 - Breakdown of Scope 1 GHG-emissions 2023

6.1 Lease cars (vehicle fleet)

The vehicle fleet, consisting of lease cars and vans, accounts for the majority (62%) of all Alfen net emissions, contributing 554 tCO₂e in Scope 1. Electricity usage for lease cars (212 tCO₂e) is part of Scope 2.

An analysis of the carbon emissions of all lease cars is included in section 7.1.

6.1.1 Number of lease cars

The Alfen vehicle fleet, including the entities in Belgium and Finland, consists of an average of 153 vehicles in 2023. Table 5 gives an overview of the vehicle fleet since 2018.

Average amount of vehicles (number)	2018	2019	2020	2021	2022	2023
Vehicles diesel	65	69	63	53	46	40
Vehicles petrol	2	11	12	14	16	15
Vehicles PHEV petrol	10	10	11	9	9	7
Vehicles EV	10	22	38	51	68	91
<i>Subtotal vehicles (PH)EV</i>	<i>20 (23%)</i>	<i>32 (29%)</i>	<i>49 (40%)</i>	<i>60 (47%)</i>	<i>77 (55%)</i>	<i>98 (64%)</i>
Total	87	112	124	127	139	153

Table 5 - Average amount of vehicles

Alfen's general aim is to increase the share of electrical (EV) and hybrid electrical (PHEV) vehicles. Since 2022, the majority of the vehicle fleet is (PH)EV. In 2023 the share of (PH)EV increased to 64%. For passenger cars this share is 83%.

6.1.2 Fuel consumption lease cars

New passenger lease cars are preferably electrical and eventually hybrid vehicles, but 92% of the company vans are still diesel-powered vehicles.

Diesel consumption for vans cannot be reduced yet. This is due to the ongoing expansion of the service geography and the increase in service density, combined with the radius of action of loaded vans and the unavailability of vehicle charging points in the service area. However, the total fuel consumption for lease-cars decreased from 268,000 liters in base year 2019 to 177,000 liters in 2023.

An intermediate target is to increase the share of electric and hybrid passenger vehicles to 90% in 2025. In 2023 this share was 82% (PH)EV.

In 2023 50 new vehicles are leased, with an average emission of 36 grams CO₂/ km according to actual emission data [208].

6.2 Heating

Sources for heating in Scope 1 are natural gas for all locations in the Netherlands and Belgium and fuel oil used in Finland. District heating (4 tCO₂e) is part of in Scope 2.

In 2023 heating contributed 27% of the Carbon footprint in Scope 1 and constitutes of 211 tonnes of the total CO₂ emissions. This is an increase of 21 tCO₂e compared with base year 2019.

Building-related emissions are influenced by building surface to be heated and the outside temperatures.

Since 2019, the building area has increased. In 2023 the production area expanded again by the acquisition of an additional energy-intensive building.

Besides, in 2023 the outdoor temperatures were slightly higher than in base year 2019.

6.3 Fugitive emissions from refrigerants

In 2023 there are no emissions from refrigerant leakages.

6.4 Equipment

Emissions for equipment are related to the use of fuels and gasses, for example by forklifts.

In 2023 Alfen started using propane gas for equipment.

In 2021 Alfen switched to 100% Hydrotreated Vegetable Oil (HVO100). HVO100 is a vegetable diesel that reduces carbon dioxide emissions from diesel consumption by 89% compared with regular diesel.

Thanks to the switch to HVO diesel nearly 35 tonnes CO₂ emissions were prevented in 2023.

HVO100 is a biofuel. In line with the SBT requirements biofuels should be accounted for in Scope 2. The CO₂ Performance Ladder Handbook requires calculation in Scope 1, which means that these emissions are reported in scope 1 in previous reports and in this 2023 report.

Emissions related to equipment contributed 1% of the carbon footprint in Scope 1 and constitutes of just 6 tonnes of total CO₂ emissions.

6.5 Self-generated electricity (building related)

In 2023 12 percent of the gross annual electricity consumption is self-generated. The emission contributes zero tonnes CO₂e.

Purchased electricity is part of Scope 2.

7 Scope 2 - Indirect emissions

Alfen’s indirect emissions in Scope 2 are a product of emissions resulting from electrically powered lease cars (company-owned vehicles), district heating and electricity consumption (building related). For Scope 2 the market based approach is used.

In 2023 the emissions in Scope 2 contribute 216 tCO₂e, a quantity of 18% of the total reported GHG emissions. This is a 1% increase compared to base year 2019 and, after a decrease in 2020, also an increase from that year onwards.

Main reason for the decrease in 2020 was the switch to renewable energy (wind energy) in Finland. The increase from 2020 is related to the increase in number of electrically powered lease cars.

Figure 5 gives a breakdown of Scope 2 emissions in 2023. The different topics are explained in the subsequent sections. Chapter 9 gives the trend over the past years.

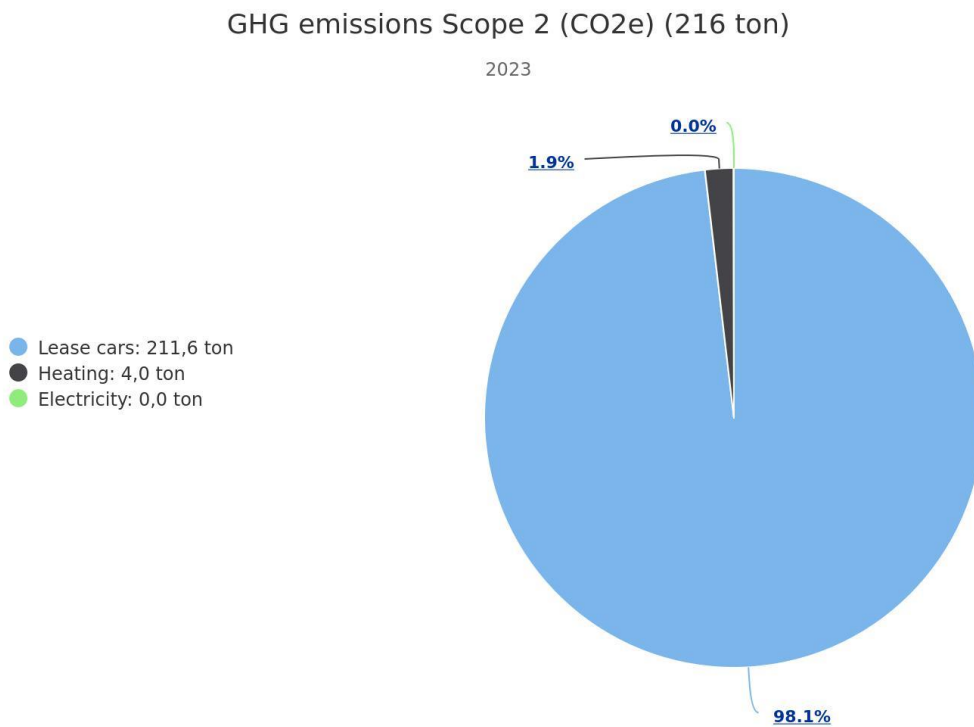


Figure 5 - Breakdown Scope 2 GHG emissions 2023

7.1 Electricity usage lease cars

Scope 2 emissions from lease cars relate to EV-charging of electrical and plug-in hybrid electric vehicles at Alfen’s "green" charging points and public and home charging points, where the source of the energy is unknown. These emissions account for 98% of the Scope 2 emissions.

Due to the increase in the number of electrical vehicles, the CO₂ emissions of lease cars in Scope 2 increases.

In 2023, a majority of 46% of the electricity is obtained from Alfen charging points, 18% from home charging and 36% from public charging. Combined with an average share of EV cars of 64% this makes 29% of the use by lease cars CO₂ emission-free.

Table 6 gives information on the CO₂ emission per electricity source for EV charging in 2023.

GHG emissions EV charging	CO ₂ emission (tonne)
Public charging	142 (68%)
Home charging	70 (33%)
Own charging points	0 (0%)
Total	212

Table 6 - GHG emissions from EV charging 2023

Lease cars have always made the largest contribution to Alfen’s CO₂ emissions, but looking at the emissions per lease car for the total vehicle fleet, fuel and electrically powered, the electrification of the fleet led to a reduction in CO₂ emissions from 9.4 tCO₂e in 2018 to 5.0 tCO₂e in 2023. This is visualized in Figure 6.

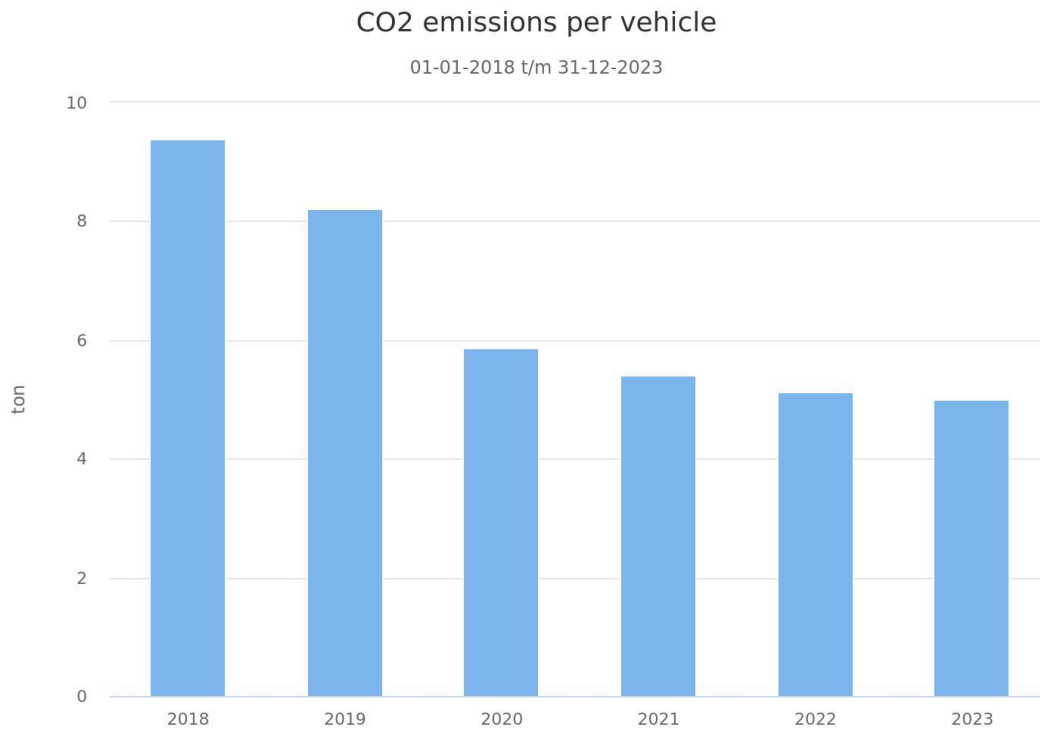


Figure 6 - CO₂ emissions per vehicle

7.2 District heating

The small share of heating in Scope 2 is related to district heating in Finland.

The consumption in 2023 is in line with the consumption in the period 2019-2022 and contributes 4 tonnes CO₂e.

7.3 Purchased electricity (building related)

Most of the electricity used by Alfen is purchased. When acquiring or renting buildings or office spaces, green electricity is purchased where possible. Self-generated electricity is part of Scope 1.

In 2023, 100% of the Scope 2 electricity used originated from renewable sources covered by green Guarantees of Origin or certificates. The emission contributes zero tonnes CO₂e.

In base year 2019 42% of purchased electricity was renewable.

8 Scope 3 - Indirect emissions for business travel

Reported GHG emissions in Scope 3 are related to category 6 of the Corporate Value Chain Accounting and reporting Standard [207].

Business travel is an unavoidable part of Alfen operations and is a product of air travel, use of private cars for business travel and public transportation.

In 2023 emissions for business travel in Scope 3 contributed 243 tCO₂e, a quantity of 20% of the total report GHG emissions. This is an increase of 20% in comparison with base year 2019.

Main reason for the increase is the internationalization of Alfen. A further explanation is given in the subsequent sections.

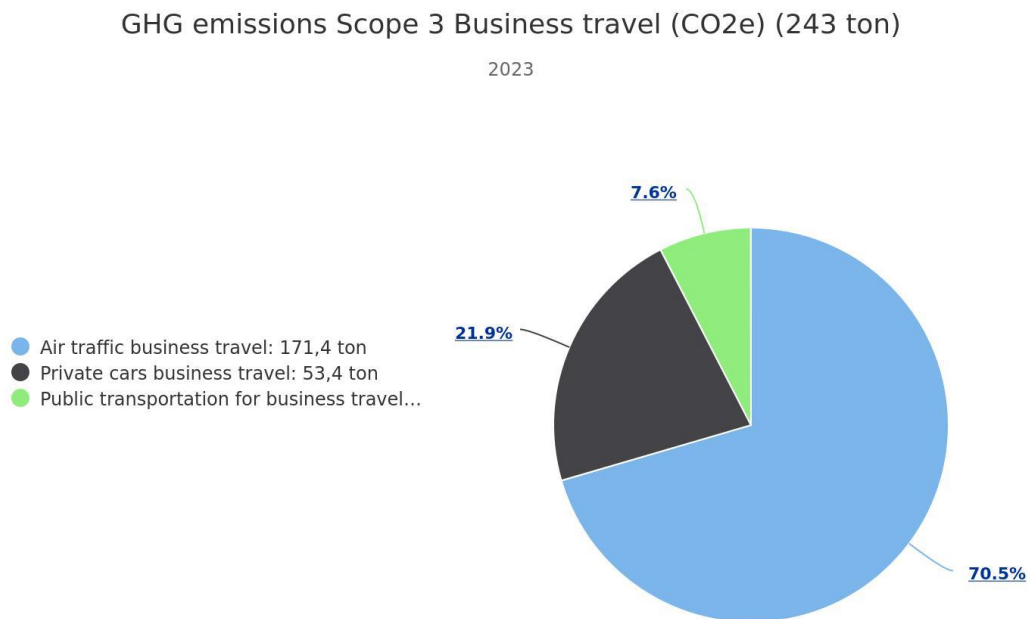


Figure 7 - Breakdown GHG emissions Scope 3 business travel 2023

8.1 Air travel

Within Alfen flights are the largest contributor to Scope 3 CO₂ emissions. In 2023 total air travel emissions contribute 14% of the total CO₂ emission and 71% of the emission in Scope 3. It concerns 740,000 passenger kilometres.

8.2 Private cars for business travel

Private cars for business travel include distance declarations and fuel declarations for rental cars.

In 2023 the emissions from personal cars for business travel account for 4% of overall emissions and 22% in Scope 3. It is a slight increase compared with base year 2019.

8.3 Public transportation

Emissions for public transport for business travel are mainly calculated on the basis of a general value and are therefore not specified by type of transport.

In 2023 the emissions for public transport account for 2% of the overall emissions and 8% in Scope 3.

In 2023, Alfen employees travelled 360,000 passenger kilometers, more than three doubling compared with 2019 and in line with the business growth.

9 Trend over the years

Figure 8 visualizes the trend of all emissions per FTE for all emissions in Scope 1, Scope 2 and business travel in Scope 3 since base year 2019. Figure 9 visualizes the trend per function.

In comparison with 2019 the most notable changes are:

Emission per FTE:

- Reduction of total emissions per FTE with 59% and also a reduction per Scope.

Building related emissions:

- Electricity, reduction related to the switch to or choice for renewable energy for all (new) buildings;
- Heating, some increase due to the increase in number of buildings and heating area but limited thanks to the energy reduction measures for separate buildings.

Mobility related emission:

- Air travel, increase related to the internationalization after a period of lower emissions in 2021 and 2022 related to COVID-related measures;
- Lease cars, decrease due to the switch to electric vehicles: reduction in fuel use and increase EV electricity consumption.

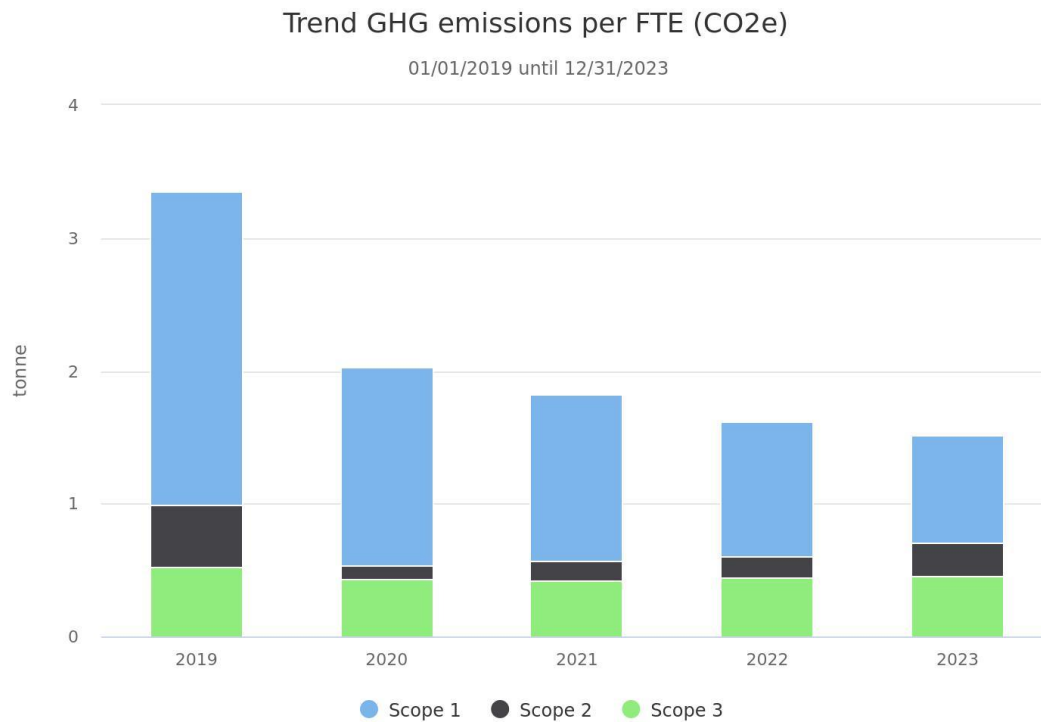


Figure 8 - Trend GHG emissions per FTE (CO₂e)

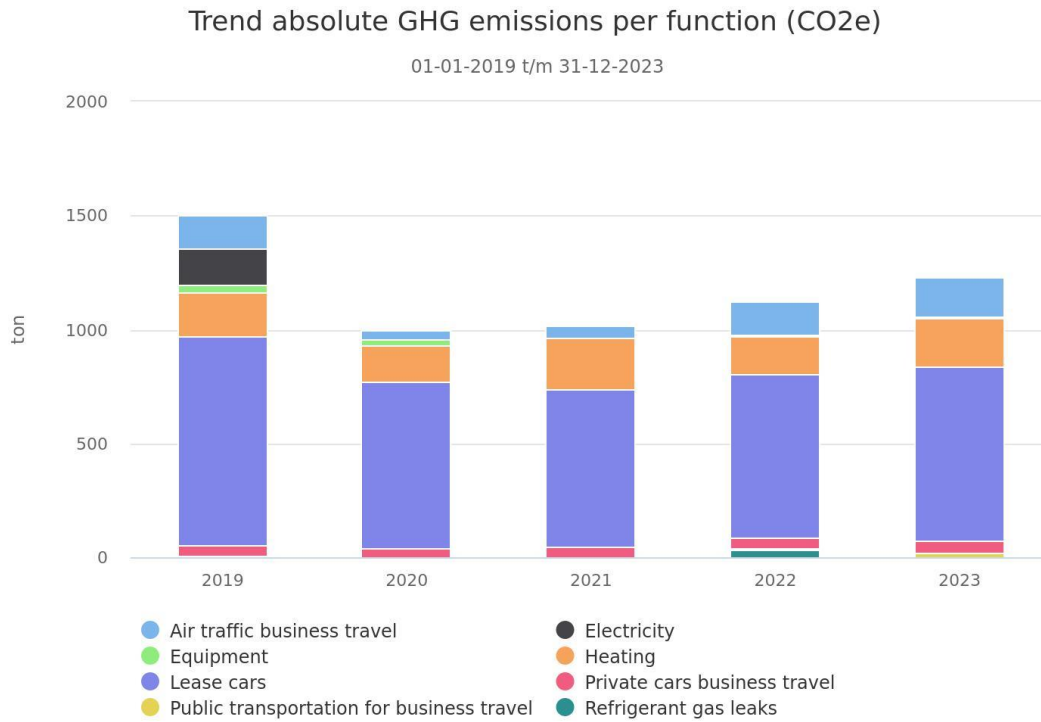


Figure 9 - Trend absolute GHG emissions per function (CO₂e)

10 Reduction targets and progress

Alfen aims to sustain and further improve its energy efficiency, in line with its reduction objectives. These objectives are reviewed annually to ensure they remain relevant and challenging.

This chapter provides an update on the progress of the targets for 2023:

- Reduction of the CO₂ emission per FTE in Scope 1, Scope 2 and Business travel in Scope 3, compared to 2019;
- Setting near term and long-term objectives as per SBTi before 2024.

The progress on the third target, a reduction of the total energy consumption per square meter building surface, is reported in the internal Energy assessment.

10.1 CO₂ emission reduction targets

CO₂ reduction targets relate to Scope 1, Scope 2 and business travel (BT) in Scope 3.

For 2023 the objective is to achieve lower CO₂ emissions per FTE in comparison with base year 2019, despite the expected growth of the company in personnel, production quantities and production area. This objective has been set for both Scope 1, Scope 2 and business travel in Scope 3.

The performance indicators are expressed as a reduction in the ratio of carbon dioxide emissions relative to average FTE and are based on the year 2019 and historical results and planned actions. The KPIs are included in Table 7.

Parameter/ KPI	2019	Target 2023
CO ₂ e Scope 1/ FTE (tonne)	2.31	< 2.31
CO ₂ e Scope 2/ FTE (tonne)	0.46	< 0.46
CO ₂ e Scope 3 BT/ FTE (tonne)	0.44	< 0.44
CO ₂ e Scope 1+2+3 BT/ FTE (tonne)	3.21	< 3.21

Table 7 - Objectives 2023

10.1.1 Progress CO₂ emission reduction

The emission intensity per FTE reduced with 59% from 3.21 tonnes CO₂e/ FTE in 2019 to 1.31 tonnes CO₂e/ FTE in 2023. This means the objective has been met. The objective for the emission per Scope has also been met with a reduction of 65% for Scope 1, 50% for Scope 2 and 41% for Scope 3 business travel emissions. The results are given in Table 8.

Green House Gas emissions (tonne CO ₂ e)	2019		2023		Realization 2023 <-> 2019
Scope 1	1.073	(72%)	771	(63%)	-28%
Scope 2	214	(14%)	216	(18%)	+1%
Scope 3 BT	202	(14%)	243	(20%)	+20%
Total Scope 1,2,3 BT	1,489		1,230		-17%
Total Scope 1+2 (acc GHG protocol)	1,286		987		-23%
Emission CO ₂ / FTE Scope 1	2.31		0.82		-65%
Emission CO ₂ /FTE Scope 2	0.46		0.23		-50%
Emission CO ₂ / FTE Scope 3 BT	0.44		0.26		-41%
Emission CO₂/FTE Scope 1,2,3 BT	3.21		1.31		-59%

Table 8 - Realization 2023

Most important factors contributing to the positive results towards the reductions targets for 2023 are the purchase of green electricity in Finland and new buildings in The Netherlands and the switch to biofuel (HVO100) in preceding years. Also various energy and CO₂ reduction measures for buildings and mobility have been taken to reduce our CO₂ footprint.

Thanks to the energy reduction measures within the buildings, in 2023 the CO₂ emissions of separate buildings further decreased. However no overall reduction in energy consumption for buildings has been achieved. Reason for this is the acquisition of an additional energy-intensive building to expand the production of our products enabling the energy transition.

Related to mobility a reduction could be achieved thanks to the further increase in the share of fully or hybrid electrical vehicles to an average of 64% in 2023.

10.1.2 Share electric and hybrid passenger cars

An intermediate target is to increase the share of electric and hybrid passenger vehicles to 90% in 2025. In 2023 the share was 82% (PH)EV.

11 Conclusions and follow-up

This report discusses the Carbon emissions in Scope 1, Scope 3 and Business travel in Scope 3.

CO₂ reduction targets 2023

For 2023 the objective is to achieve lower CO₂ emissions per FTE in comparison with base year 2019, despite the expected growth of the company in personnel, production quantities and production area. This objective has been set for Scope 1, Scope 2 and business travel in Scope 3. This corresponds to an emission of 3.21 tCO₂e/ FTE in total and 2.31 tCO₂e/ FTE in Scope 1, 0.46 tCO₂e/ FTE in Scope 2 and 0.44 tCO₂e/ FTE for business travel in Scope 3.

Based on the results presented in chapter 10, the conclusion is that the objective has been met with an amount of 1.31 tCO₂e/ FTE in total, which corresponds to a reduction of 59% compared to base year 2019. The objective has also been met per Scope with a reduction of 65% for Scope 1, 50% for Scope 2 and 41% for Scope 3 business travel emissions.

The positive results are related to the efforts to reduce energy for buildings and mobility, like the purchase of green electricity in Finland and new buildings in The Netherlands, the switch to biofuel (HVO100), and the electrification of the own vehicle fleet.

Thanks to the energy reduction measures within the buildings, the CO₂ emissions of separate existing buildings further decreased. However, in 2023 no overall reduction in energy consumption for buildings has been achieved. Reason for this is the acquisition of an additional energy-intensive building to expand the production of our products enabling the energy transition.

In 2023 the total absolute emissions contribute 1,230 tonnes CO₂e. This is a reduction of 17% compared to base year 2019, despite a business revenue growth of 350%.

Science based target setting

In 2023 Alfen N.V. completed the Scope 3 inventory over the year 2021 [104] and submitted near-term and long-term Science based targets for Scope 1, 2 and 3 GHG emissions in line with global warming limitation targets. These targets will be communicated after approval, expected mid-2024.

Outlook Scope 1&2 emissions

In 2023 the GHG-emissions in Scope 1 and 2 contribute 987 tCO₂e. This is a reduction of 23% compared to base year 2019.

Existing actions and new defined actions to achieve these objectives are presented in Appendix C. This Appendix also gives an overview of the status of all defined actions. Actions are based on current knowledge and will be adapted to upcoming SBTi targets.

12 Additional information

This chapter provides information on the used methodology, the calculation method, changes in the calculation and quality of data.

12.1 Methodology

Alfen is certified according to the Energy Management standard ISO 50001 and Environmental Management Standard ISO 14001 with CO₂ reduction and reports CO₂ emissions in line with the Dutch CO₂ Performance Ladder handbook 3.1. An energy and CO₂ management system requires continuous improvement in insight, communication and operational management cooperation, and energy and CO₂ reduction measures.

To calculate the CO₂ emissions inventory, Alfen identified all relevant carbon dioxide emission sources, collected activity data from the relevant business units. For the registration and calculation, the software application Smart Trackers, a program for CO₂ measurements and assessments, is used.

The quantification of CO₂ emissions in Scope 1 is based on the available activity data for fuels consumed, including natural gas. Scope 2 CO₂ emissions are primarily calculated from metered electricity consumption values, including EV charging and the use of bio-fuel. CO₂ emissions from business travel in Scope 3 are mainly calculated from activity data from supplier portals and declarations, such as passenger miles, vehicle type and fuel type. Since 2020 the new declaration system is used from which these data can be directly derived. Since 2023 for flight distances from the supplier portal are used. Data is supplemented with information from cost declarations.

12.2 Calculation method

The application Smart Trackers uses emission factors from the publicly available website www.co2emissiefactoren.nl (version Jan-2023), which is recommended by Handbook 3.1 of the CO₂ Performance Ladder. Emission factors used in 2023 are included in Appendix B. Activity data and conversion factors for the period 2020-2023 have been verified by an external party.

12.2.1 Changes in calculation method in 2023

In this report several changes are made in the calculation method:

- For non-renewable (grey) electricity in Belgium and Germany other emission factors have been applied.

12.2.2 Recalculation of base year and historical data

Changes in the calculation method did not affect our base year data.

For 2020 and 2021 the CO₂ emissions for non-renewable energy have been adjusted as reported in section 12.2.1.

Compared to the annual financial report 2023 the carbon footprint has been adjusted as stated below based on the changes in emission factors for renewable electricity and additional cost declarations for the fuels and EV-charging of lease cars and private or rental cars with corresponding correction per FTE.

- Scope 1: adjusted from 741 tCO₂e to 771 tCO₂e
- Scope 2: adjusted from 212 tCO₂e to 216 tCO₂e
- Scope 3 BT adjusted from 270 tCO₂e to 243 tCO₂e.
- Total GHG footprint: from 1223 tCO₂e to 1230 tCO₂e.

12.3 Data quality and completeness

Scope	Emission source	Activity data	Data source	Remarks
1	Natural gas	Primary	Telemetric gas meter readings energy company, own visual readings.	Data main buildings is based on telemetric gas meter readings. For other buildings the measurement of data does not relate to the entire reporting period. To minimize the uncertainty of actual natural gas consumption, a weighted (degree)day method was applied in the allocation of the available measurement data to consumption over the reporting period.
	Fossil fuel and gas for stationary vehicles and forklifts	Primary	Supplier invoices	
	Fuel oil for heating FI	Primary	Own meter reading	
	Fossil fuels for lease cars	Primary / secondary	Reports lease company, cost declarations	Mainly primary data supplemented with costs declarations based on average fuel costs.
	Own electricity production solar panels	Primary	PV-electricity meter readings	
2	Purchased electricity (renewable and non-renewable sources)	Primary	Telemetric electricity meter readings energy company, own visual readings	Mainly based on telemetric electricity meter readings. Visual readings in Belgium and Germany.
	Purchased electricity for lease cars (unknown source)	Primary/secondary	Reports supplier portal (fuel cards), ICU Connect, cost declarations	Mainly primary data: Home charging 2019: €0,23/ kWh, based on average costs own lease cars. From 2020 home charging has been measured (ICU Connect). Public charging: supplier portal, supplemented with costs declarations based on average kWh costs.
	Bio-fuel for stationary vehicles and forklifts	Primary	Supplier invoices	
	Electricity usage lease cars (own charging points)	Primary	ICU Connect	
	District Heating Finland	Primary	Meter readings energy company.	
3	Business travel - private cars	Primary/secondary	Travel expenses declaration system based on distances generated by google maps, fuel type and car type.	Mainly primary data, supplemented with cost declarations based on average fuel costs.
	Business travel - public transport	Secondary	Travel expenses declaration system	The use of public transport is calculated by dividing the travel costs by the official rate of €0,21/km. In Finland information on distances is used.
	Business travel - air	Secondary	Overview/portal booking agency, cost declarations	Flight distances 2019 are calculated using distance from http://nl.distance.to/ . From 2020 information travel company is used and from 2023 the portal. For flight cost declarations the emission factor is calculated from the portal.

Data source is accurate
 Data source is satisfactory, but could be improved
 Data source is poor and its improvement is a priority

Table 9 - Overview data quality and completeness

Appendices

Number	Title
Appendix A	Carbon Footprint Alfen 2023 by Scope
Appendix B	CO2 emission factors 2023
Appendix C	Action plan reduction targets 2022-2030

Appendix A Carbon Footprint Alfen 2023 by Scope

Emissions Scope 1

CO ₂ e (tonne)	2019	2020	2021	2022	2023
Electricity	0	0	0	0	0
Equipment	31	23	3	3	6
Heating	189	160	223	166	211
Lease cars	852	671	598	591	554
Refrigerant leaks	0	0	0	35	0
Total Scope 1	1,073	854	825	795	771

Emissions Scope 2

CO ₂ e (tonne)	2019	2020	2021	2022	2023
Electricity	160	0	0	2	0
Heating	4	3	4	4	4
Lease cars	49	60	89	122	212
Total Scope 2	214	63	93	128	216

Emissions Scope 3, business travel

CO ₂ e (tonne)	2019	2020	2021	2022	2023
Air traffic	147	44	48	146	171
Private cars	51	36	48	49	53
Public transportation	4	2	1	4	18
Total Scope 3 BT	202	82	97	198	243

Appendix B CO₂ emission factors 2023

Function	Gauge	Country	Conversion factor	Source other than www.CO2emissionfactoren.nl
Electricity	Renewable energy - purchased (kWh)	All	0 g/kWh	
	Solar energy - own production (kWh)	NL	0 g/kWh	
Lease cars + business travel private cars	Fuels - Petrol (liter)	All	2,821 g/liter	
	Fuels - Diesel (liter)	All	3,256 kg/liter	
Lease cars	EV Electricity consumption own charging points (kWh)	All	0 g/kWh	
	EV Electricity consumption home and public charging (kWh)	NL, FI	456 g/kWh	
	EV Electricity consumption home and public charging (kWh)	DU	745,52 g/kWh	AIB 2023
	EV Electricity consumption home and public charging (kWh)	BE	213 g/kWh	www.CO2emissiefactoren.be
Equipment	Diesel usage HVO100 (liter)	NL	347 g/liter	
	Propane	NL	3,397 kg/liter	
Public transport	General (km)	All	20 g/km	
	Train (NS)	NL	3 g/km	
	International train	All	17 g/km	
	Ferry	All	1,420 g/km	
Business travel private cars	Unknown fuel type (km)	All	193 g/km	
	Petrol large vehicle (km)	All	218 g/km	
	Petrol small vehicle (km)	All	174 g/km	
	Petrol medium size vehicle (km)	All	204 g/km	
	Diesel large vehicle (km)	All	203 g/km	
	Diesel small vehicle (km)	All	166 g/km	
	Diesel medium size vehicle (km)	All	180 g/km	
	Hybrid vehicle (km)	All	144 g/km	
	L.P.G. medium size vehicle (km)	All	152 g/km	
	EV public charging (km)	All	94 g/km	
Heating	Natural gas usage (m ³)	NL, BE	2,079 g/m ³	
	Fuel Oil FI (liter)	FI	3,468 g/liter	
	District Heating (kWh)	FI	0.0094 kg/kWh	supplier declaration
Air travel	Flight declarations - distance unspecified (EUR)	All	0.591 kg/EUR	own factor, based on flight costs
	700 - 2500 km (km)	All	172 g/km	
	< 700 km (km)	All	234 g/km	
	> 2500 km (km)	All	157 g/km	

Appendix C Action plan reduction targets 2022-2030

No.	Action	Reduction	KPI	Resources	Responsible	Realization date	Priority	Status	Explanation Status
Mobility									
2023.01	In 2025 the share of fully or hybrid electric passenger cars is 90%.	n.a.	Number of (PH)EV/ total number SMTR		HR	2025	High	Ongoing	In 2023 the share was 83% (PH)EV.
2023.02	Green public charging	100% (70 tCO ₂ e)	CO ₂ public charging	t.b.a.	-	2030	Low	Open	Insight into the origin of electricity is not yet available.
2023.03	Update mobility/ lease policy	n.a.	-		HR	2023	High	Closed	Mobility / lease policy revised in 2023
2023.04	Introduce/ update travel policy	n.a.	-		HR	2023	High	Closed	Travel policy introduced in 2023
Buildings, tools and equipment									
2020.07	NL Electricity reduction measures lighting and ventilation	± 8 kWh	Electricity use NL	Appr. € 2.300	TD	2021Q4	Medium	On hold	All measures for lighting have been implemented. Action for ventilation has been put on hold: due to COVID-19, maximum ventilation has been maintained.
2023.05	Replace diesel forklifts by electrical equipment	3 tCO ₂ e	Diesel use equipment		TD	2027	Medium	Ongoing	Need for diesel powered equipment will be reduced with new way of working in new production area HBW 79
2023.06	NL: Self-supporting energy new building HBW 79	n.a.	% self-supporting HBW79		TD/BI	2024	High	Ongoing	Key transfer is planned Q1-2023. Commissioning phases extend into Q3-2023.
2023.07	NL: natural gas free buildings Hefbrugweg/ Vlotbrugweg	189 tCO ₂ e	Gas use NL 0 m ³		TD	2027	High	Ongoing	1 building is gas-free and buildings for storage activities no longer use natural gas.
Corporate and administration									
2023.08	Set Science based short- and long-term targets for Scope 1 and 2	n.a.	-		CSR-team	2023	High	Closed	Targets submitted to SBTi and pending for approval.
2023.09	Set Science based short- and long-term targets for Scope 3	n.a.	-		CSR-team	2023	High	Closed	Targets submitted to SBTi and pending for approval.
2023.10	Set-up data improvement plan for Scope 3 CO ₂ emissions.	n.a.	-		CSR-team	2023	High	Ongoing	Part of the CSR program
2023.11	Improve energy monitoring of activities	n.a.	-		TD	2027	Medium	Ongoing	Part of designing production-lines in new buildings and refurbishment