AIM
ALFEN
INTEGRATED
MANAGEMENT
SYSTEM

Carbon Footprint Report 2021

GHG emissions resulting from internal operations (verified)

AIM-QHSE-GEN-0.00-01-RP-05

21-Mar-22 | Revision -0

ALFEN
POWER TO ADAPT

Document data

Rev.	Purpose	Date	Initiated	Checked	Verified	Approved
-0	Approved	21-Mar-22	SP	HN	LS	MR

This document is signed digitally.

Revision control		
Revision	**Section**	**Change**
-		

Table of Contents

Page

Figures

Tables

Introduction

This annual report of Alfen N.V. (hereafter "Alfen" or "the Company") provides an overview of the Carbon dioxide (CO_2) emission inventory for Alfen's activities in 2021. It 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], version 3.1 of the CO_2 Performance Ladder [202], the Green House Gas (GHG) protocol [203] and the international standard ISO 14064-1 for greenhouse gases [204]. This report contains all subjects from section 9.3.1 of the ISO 14064-1: 2018, the emission factors (subject "t"), excluded. The emission factors used are available at Alfen.

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 CO_2 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 of the energy performance is part of the Plan-Do-Check-Act (PDCA) steering cycle. The PDCA steering 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, none excluded.
Direct emissions (Scope 1) are emissions emitted by installations that are owed or controlled by Alfen, such as emissions from own gas heating systems and vehicle fleet and equipment with 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 Corporate Value Chain (Scope 3) Accounting and reporting standard of the GHG protocol [205].
Figure 1 shows the CO_2 Scope emissions related to the company.

Additionally, this report provides in chapter 9 a brief update on the progress of the CO_2 reduction plan.

An overview of methodology and data quality is provided in chapter 11.

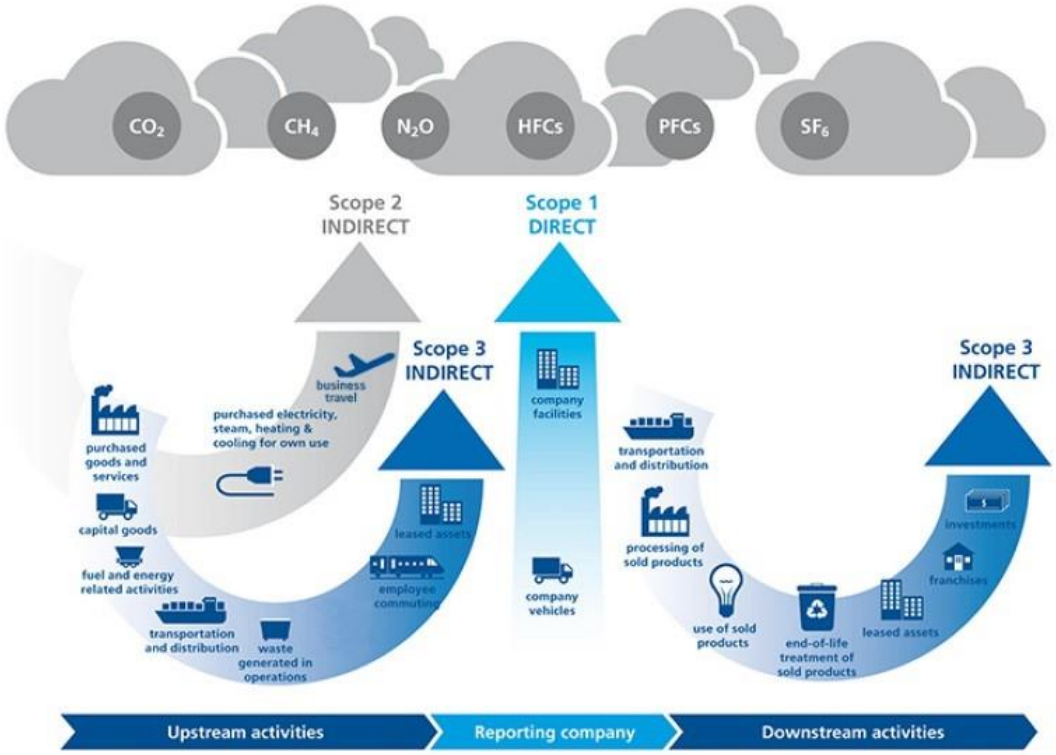

Figure 1 - Scopes Carbon Footprint analysis

Alfen aims to gain more insight into the other Scope 3 CO_2 emissions. In the Materiality Analysis on Scope 3 emissions [106], the significant categories for CO_2 reduction in the value chain are established. Thereafter actions and targets are defined in two Value Chain Analyses: for Alfen Charging Equipment [104] and Alfen Transformer stations [105].

Due to product extension there is a need for additional and more detailed information on the carbon footprint in the value chain. This need is further increased due to the new CSRD legislation. This legislation also requires insight in other Scope 3 emissions. Therefore it was decided to re-examine significant Scope 3 CO_2 emissions and to determine KPIs and targets in line with CSRD. Our findings, decisions and plans will be communicated by the end of 2022.

For the latest update on opportunities for improvement, reference is made to the limited update in our chain analysis on Alfen Charging Equipment.

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 and aim to better understand the carbon footprint in the value chain. As part of the assessment of our CO_2 performance, in 2021 Alfen is certified at level 4 (out of 5) under the Dutch CO_2 performance ladder. As this program is not always fully understood by Alfen's stakeholders, we have decided to change to the internationally recognized Energy Management standard ISO 50001. Reporting of CO_2 emissions will be maintained under this certification in the spirit of the CO_2 performance ladder.

In recent years, the business has been growing strongly, and as such, logically our CO_2 emissions would also grow without any further action. To counter this, we have set ourselves the goal of achieve lower or equivalent CO_2 emissions per FTE in the period 2020-2022 in comparison with base year 2019, despite this growth.
In this report the targets are reported in three parts: Scope 1, Scope 2 and business travel in Scope 3, which is in line with the CO_2 performance Ladder handbook 3.1.

Various measures have been taken in 2021 to reduce our CO_2 footprint. We started using 100% Hydrotreated Vegetable Oil for our equipment, replaced obsolete devices, such as our main compressor, and installed electrical heating in office area's.
Also we further increased the share of electric vehicles in accordance with our EV policy and currently 50% of our fleet consist of fully or hybrid electrical vehicles.
Finally, like in 2020, COVID-19 measures reduced Alfen's mobility CO_2 emissions as well, since flights were significantly reduced and we worked more from home. The latter, we anticipate to continue forward as we have embraced a hybrid working model (home vs office).

The measures that we took, in combination with the influence of COVID-19, resulted in a reduction of the absolute CO_2 emissions compared with base year 2019 for all Scopes, as well as the CO_2 emissions per average FTE, even while the business has been growing rapidly with a yearly 32% revenue growth. Therefore, we have achieved our objective for the year 2021.

We are committed to continue to further improve our sustainability performance as we transition towards a truly sustainable society for future generations. As such, we plan to commit to specific sustainability targets of our own business activities, for instance science-based and in line with global warming limitation targets. We plan to communicate this at the end of 2022.

Marco Roeleveld,
CEO of Alfen N.V.

1 Abbreviations & Definitions

1.1 Abbreviations

Abbreviation	Description
AIM	Alfen Integrated Management system
CO_2	Carbon dioxide
COP	Conference Of the Parties
CRSD	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

1.2 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 owed 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.
Value chain analysis	Analysis of CO_2 emissions in one of the chains in which the organisation is active.

Table 2 - Definitions

2 References

2.1 AIM Documents

Ref.	Document Title	AIM Document Number	Extern 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]	Corporate value chain analysis Alfen Charging Equipment	AIM-QHSE-GEN-0.00-01-MA-03	
[105]	Corporate value chain analysis Alfen Transformer Stations	AIM-QHSE-GEN-0.00-01-MA-02	
[106]	Materiality Analysis CO_2 Performance Ladder/ "Materialiteitsanalyse CO_2-Prestatieladder"	AIM-QHSE-GEN-0.00-01-MA-01	

Table 3 - AIM Documents

2.2 External Documents

Ref.	Document Title	Alfen Document Number	Extern Document Number
[201]	Energy management systems – Requirements with guidance for use		EN ISO 50001: 2018
[202]	Handbook CO_2 Performance Ladder		Version 3.1
[203]	GHG Protocol		2011
[204]	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
[205]	GHG Protocol - Corporate Value Chain (Scope 3) Accounting and Reporting Standard		2011
[206]	"Praktijkverbruik"		Travelcard: www.werkelijkverbruik.nl

Table 4 - External Documents

3 The organisation

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 electric vehicles and energy storage systems.

Alfen sells products and services in more than 25 countries across Europe and also beyond Europe. The production facilities are located in the Netherlands, Belgium and Finland. In 2021 an average of 640 employees work within Alfen.

Based on the CO_2 emissions in the year 2021 Alfen is categorised as a medium-size company under the CO_2 Performance Ladder [202].

3.1 Organisational boundaries

Alfen's organisational boundary [101] has been determined according to the principle of Operational Control, as specified in the GHG protocol [203]. 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 in the Netherlands, Belgium and Finland:

- Alfen N.V., Almere
- Alfen B.V., Almere
- Alfen ICU B.V., Almere
- Alfen Projects B.V., Almere
- Alfen BV BA, Gent
- 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.

Organisational changes
The Company grew from 584 FTEs at 31 December 2020 to 683 FTEs at 31 December 2021.

There is no change in the legal boundaries compared with the year 2019 and 2020.

3.2 Reporting organisation

Alfen N.V.
Hefbrugweg 28
1332 AP Almere

Tel.: ++31 36 54 93 400
E-mail: qhse@alfen.com

3.3 Responsible person

The responsible person for the Carbon Footprint Report 2021 is Mr. M. Roeleveld, CEO of Alfen N.V.

3.4 Reporting period

The reporting period covers January 01, 2021 until December 31, 2021, with base year 2019.

3.5 Verification

The figures and conversion factors used for the CO_2 footprint have been verified by an external party.

4 Carbon footprint 2021

The carbon footprint of Alfen includes all emissions in Scope 1, Scope 2 and Business Travel in Scope 3. The latter concerns Scope 3 CO_2 emissions in category 6 of the Corporate Value Chain Accounting and reporting Standard [205].

Alfen's total emissions in 2021 are equivalent to 1,014 tCO_2e. A breakdown by function is given in Figure 2.

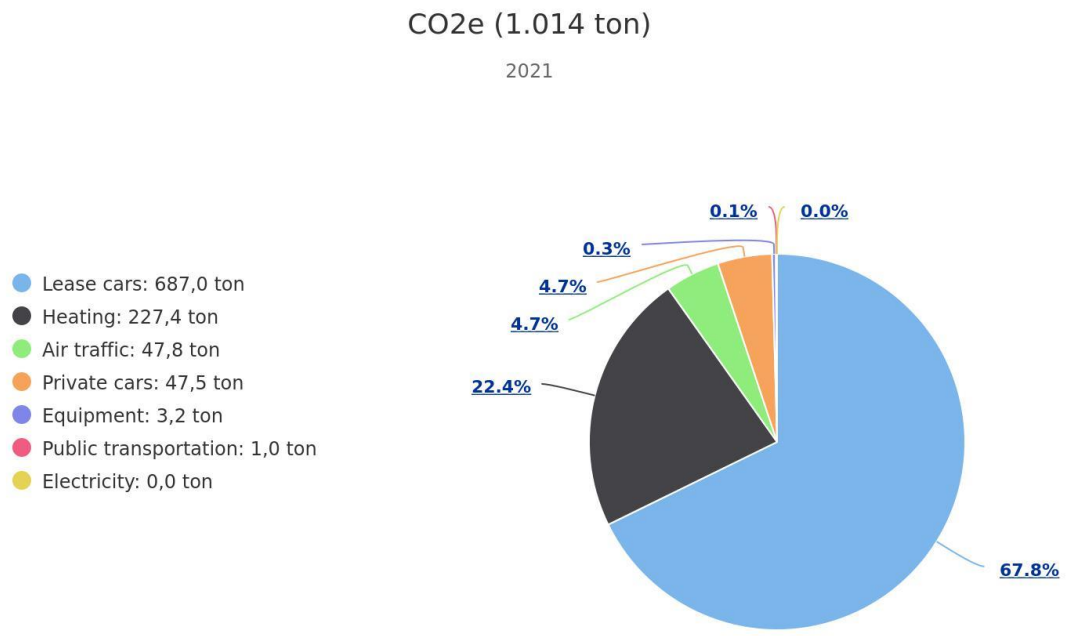

Figure 2 - Alfen Carbon Footprint 2021

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 emissions.
As a result of the COVID-19 pandemic and related measures, from 2020 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.

Comparison of the carbon footprint in 2021 with the footprint in base year 2019 shows a 32% decrease. Over the same period, the annual business revenue growth was 32%.
Figure 10 in chapter 8 shows the trend in CO_2 emissions related to category over the past three years.

5 Scope 1 - Direct CO_2 Emissions

In 2021, direct emissions accounted for 825 tonnes of the CO_2 emitted by Alfen, a quantity of 81% of the total carbon emissions. This is a 23% decrease in comparison with base year 2019.

The direct emissions are a product of fuel powered lease cars (company-owned vehicles), stationary equipment and heating (natural gas for all locations in the Netherlands and Belgium and fuel oil used in Finland). The use of self-generated electricity is also counted under Scope 1, but this emission contributes zero tonnes CO_2e.

A breakdown is shown in Figure 3 and the different topics are successively explained in more detail in the following sections. Chapter 8 provides information on the trend of recent years.

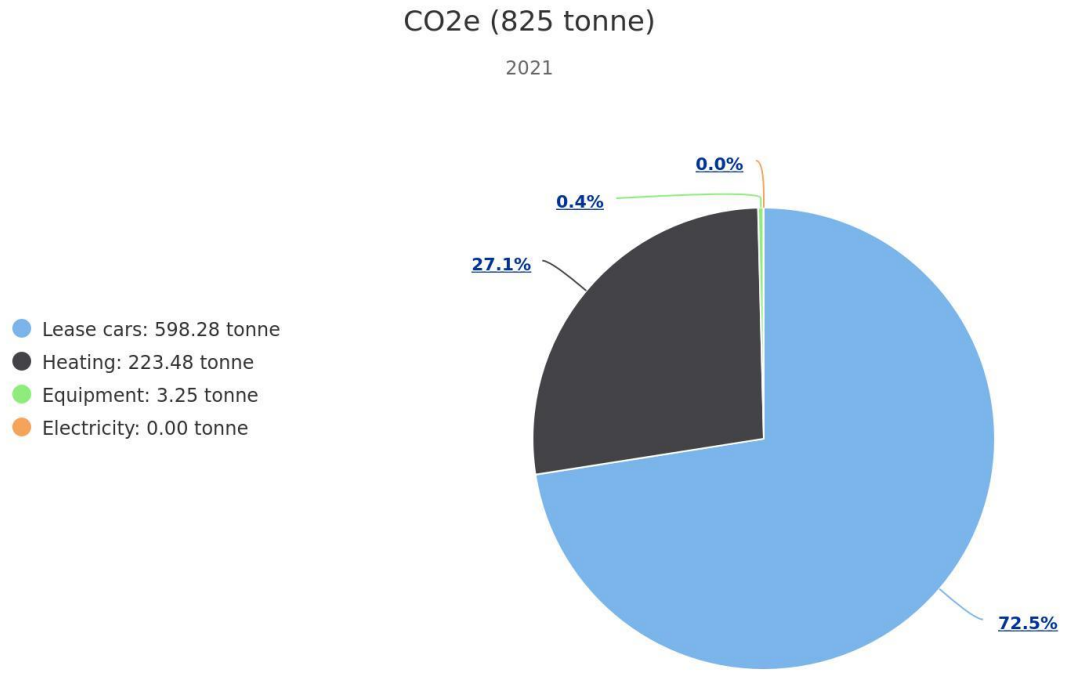

Figure 3 - Breakdown of Scope 1 CO_2 emissions 2021

5.1 Equipment

Diesel fuel consumption by equipment, like stationary vehicles and forklifts, contributed 0.4% of the carbon footprint in Scope 1 and constitutes of just 3 tonnes of total CO_2 emissions.

Carbon emissions related to equipment are lower than in 2019 and 2020 due to the switch to 100% Hydrotreated Vegetable Oil (HVO100) in 2021. HVO100 is a vegetable diesel that reduces carbon dioxide emissions from diesel consumption by 89% compared with regular diesel.
Thanks to this switch in 2021 over 30 tonnes CO_2 emissions were prevented.

5.2 Heating

In 2021 heating for all buildings contributed 27% of the Carbon footprint in Scope 1 and constitutes of 223 tonnes of the total CO_2 emissions. This is an increase of 34 tCO_2e compared with base year 2019.

Building-related emissions are influenced by higher employee numbers, the increase of (heated) building area in combination with the relative cold winter months in 2021.
Besides the volume for the rental warehouse in de first half year was unexpected high. Since October 2021 the rental warehouse is considered outdoor area.

5.3 Lease cars (vehicle fleet)

The vehicle fleet, consisting of lease cars and vans, accounts for the majority (73%) of all Alfen net emissions, contributing 598 tCO_2e in Scope 1. A share of 85 to 90% is related to the vans.
Electricity usage for lease cars (89 tCO_2e) is part of Scope 2.

5.3.1 Amount of lease cars

The Alfen vehicle fleet (including Belgium and Finland) consists of 127 vehicles by the end of 2021. Figure 4 gives an overview of the vehicle fleet since 2018.

At the end of 2021 for the first time the majority of the vehicle fleet is electric powered (52 vehicles in total of which 2 vans). The total number of fully electrical (EV) and petrol powered hybrid electrical vehicles (PHEV) increased to 61. This corresponds with 50% of the total vehicle fleet.

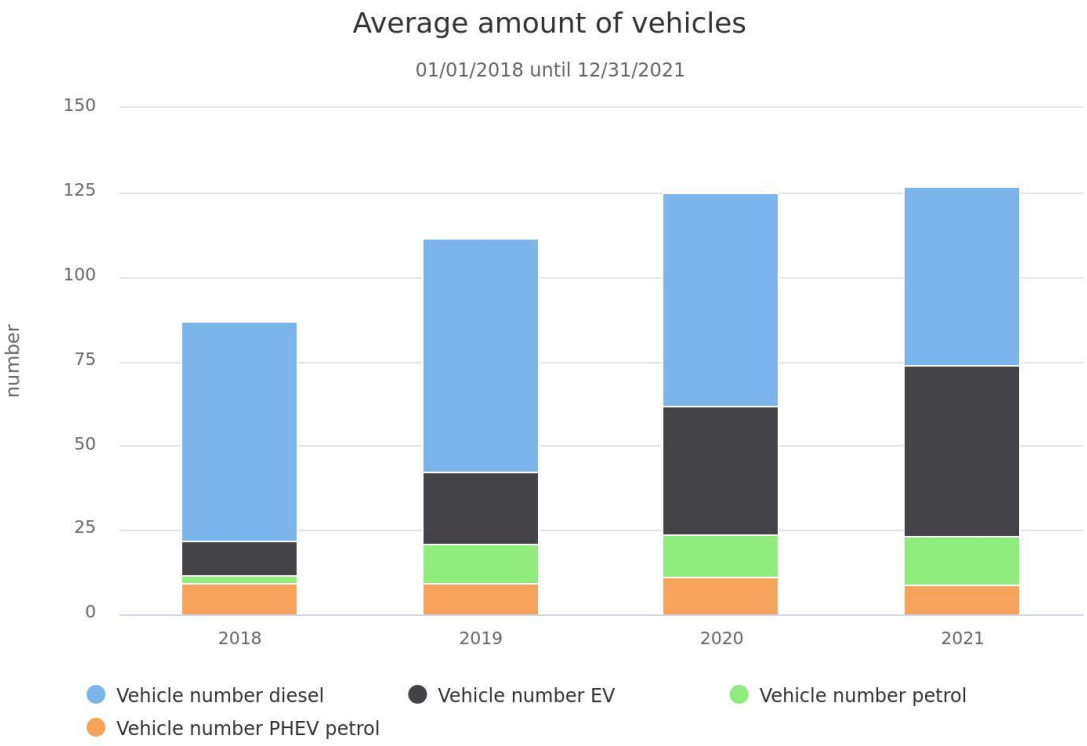

Figure 4 - Amount of vehicles

Amount of vehicles	2018	2019	2020	2021
Vehicles diesel	65	69	63	53
Vehicles EV	10	22	38	51
Vehicles petrol	2	11	12	14
Vehicles PHEV petrol	10	10	11	9
Total	**87**	**112**	**124**	**127**

Table 5 - Amount of vehicles

5.3.2 Fuel consumption lease cars

Most of the company vans are diesel-powered vehicles. Due to the expansion of service geography and the increase of service density, diesel consumption cannot currently be reduced.

However, due to the measures related to COVID-19 the total fuel consumption for lease-cars is lower than in base year 2019 and in 2020. This is visualized in Figure 5.

Compared with the half year report, the fuel usage for 2021 has been adjusted, as a part of the declarations were related to lease cars (Scope 1) instead of private cars (Scope 3).

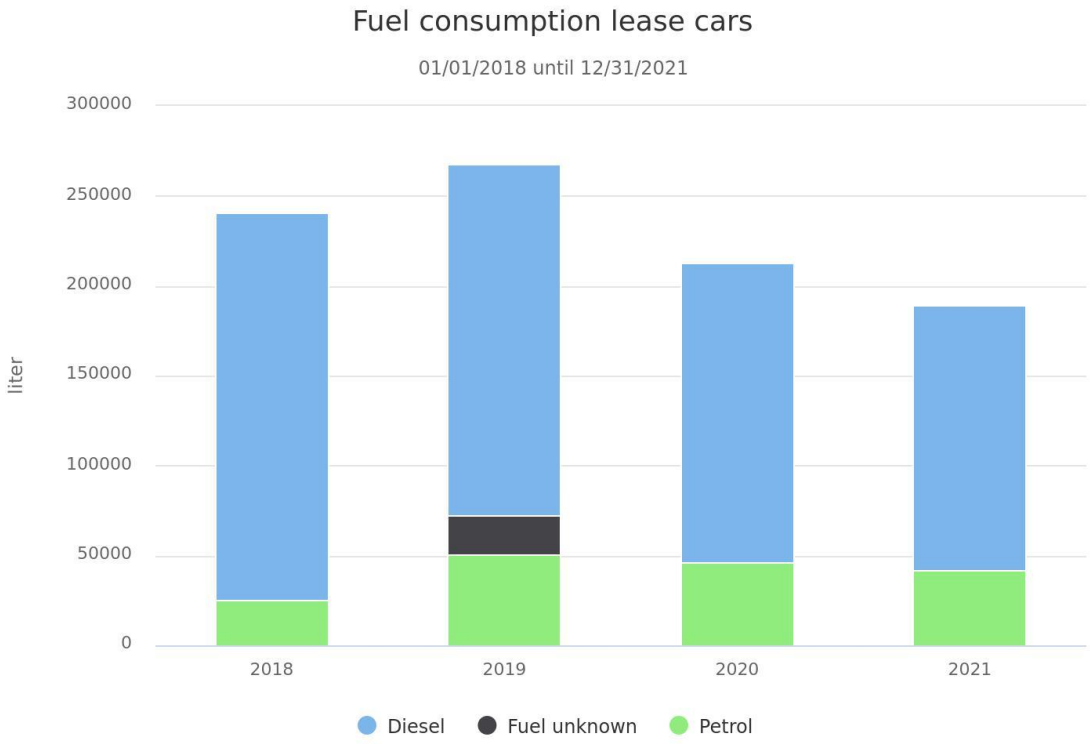

Figure 5 - Fuel-consumption lease cars

5.4 Refrigerants

In the year 2021 air conditioners are not refilled with refrigerants.

6 Scope 2 - Indirect emissions

Alfen's indirect emissions in Scope 2 are a product of emissions resulting from electricity consumption and district heating (building related emissions) and electric powered lease cars (company-owned vehicles).

In 2021 the emissions in Scope 2 contribute 93 tCO_2e, a quantity of 9% of the total carbon dioxide emissions. This is a decrease of 57% in comparison with base year 2019, but an increase from 2020. Main reason for the decrease is the switch to renewable energy (wind energy) in Finland since 2020. The increase from 2020 is related to the increase in number of electric powered lease cars.

Figure 6 shows a breakdown of Scope 2 emissions in 2021. The different topics are explained in the subsequent sections. Chapter 8 gives the trend over the past years.

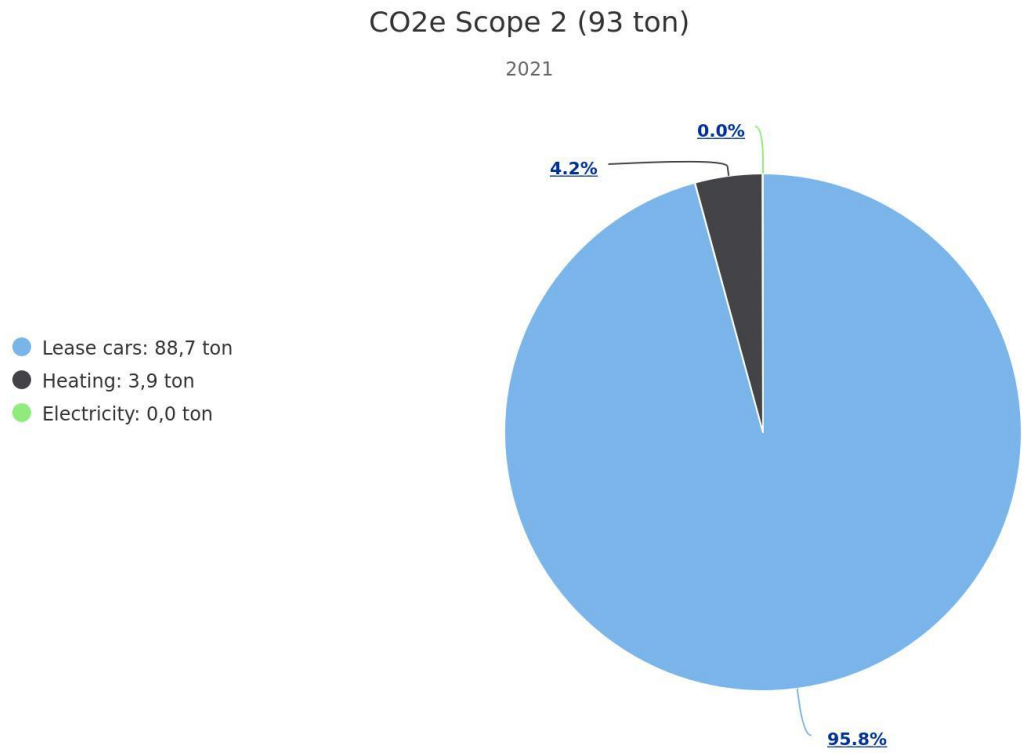

Figure 6 - Breakdown Scope 2 CO_2 emissions 2021

6.1 Electricity consumption Building related

In 2021, 100% of the Scope 2 electricity used originated from renewable sources covered by green Guarantees of Origin. This is significantly more than in base year 2019, where this contribution was 43%.

6.2 Electricity usage lease cars

Scope 2 emissions from lease cars relate to EV-charging of electric 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 96% of the Scope 2 emissions.

Home charging has been reported separately since 2020. Before this year, it has been included under public charging. Also the use of Alfen charging points was not calculated separately, but included in the electricity consumption.

Table 6 gives information on the electricity consumption for EV-charging. In 2021, a majority of 52% of the electricity is generated from Alfen charging points, 21% from home charging and 27% from public charging. Combined with the 50% share of EV cars this makes 22% of the use by lease cars CO_2 emission-free.

EV-charging	CO_2 emission (tonne)	
Public charging	50	(56%)
Home charging	39	(44%)
Own charging points	0	(0%)
Total	**89**	

Table 6 - EV-charging

6.3 District heating

Heating in Scope 2 concerns district heating in Finland.
The consumption in 2021 is in line with the consumption in 2019 and 2020.

7 Scope 3 - Indirect emissions for business travel

Reported CO_2 emissions in Scope 3 concern category 6 of the Corporate Value Chain Accounting and reporting Standard [205].

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

In 2021 these emissions contributed 96 tCO_2e, a quantity of 10% of the total carbon dioxide emissions. This is a decrease of 52% in comparison with base year 2019, but an increase from 2020. Main reason for the decrease is the reduction in mobility due to the COVID-19 measures. The increase in 2021 is related to the increase in the use of own vehicles, rental cars and public transport. A further explanation is given in the subsequent sections.

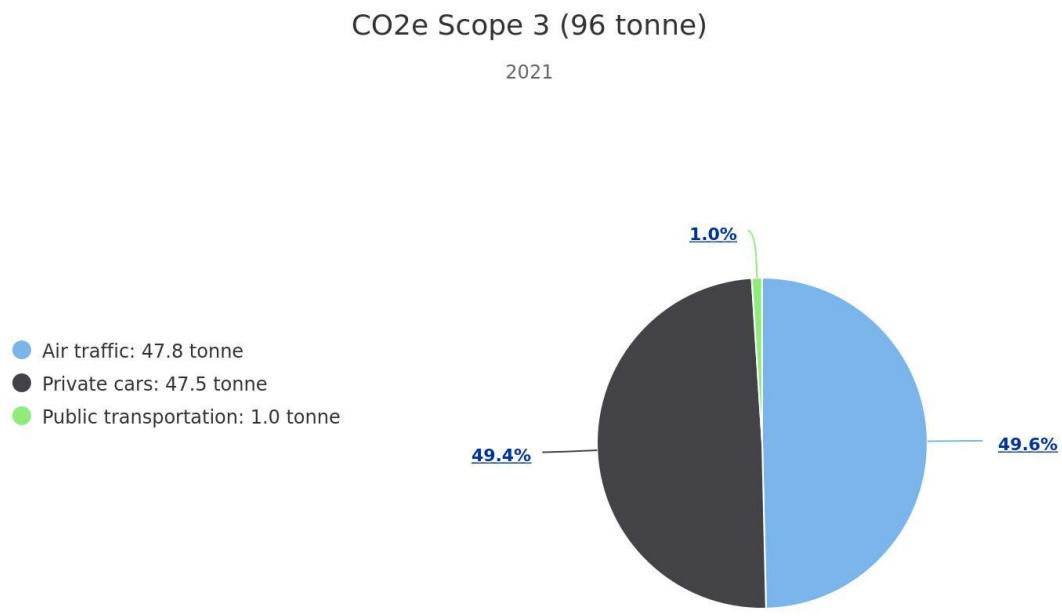

Figure 7 - Breakdown Scope 3 CO_2 emissions 2021

7.1 Air travel

Air travel distances within Alfen and related CO_2 emissions are visualised in Figure 8 and Table 7. Due to the COVID-19 measures air travel emissions decreased with 68% from 147 tCO_2e in 2019 to 47 tCO_2e in 2021.

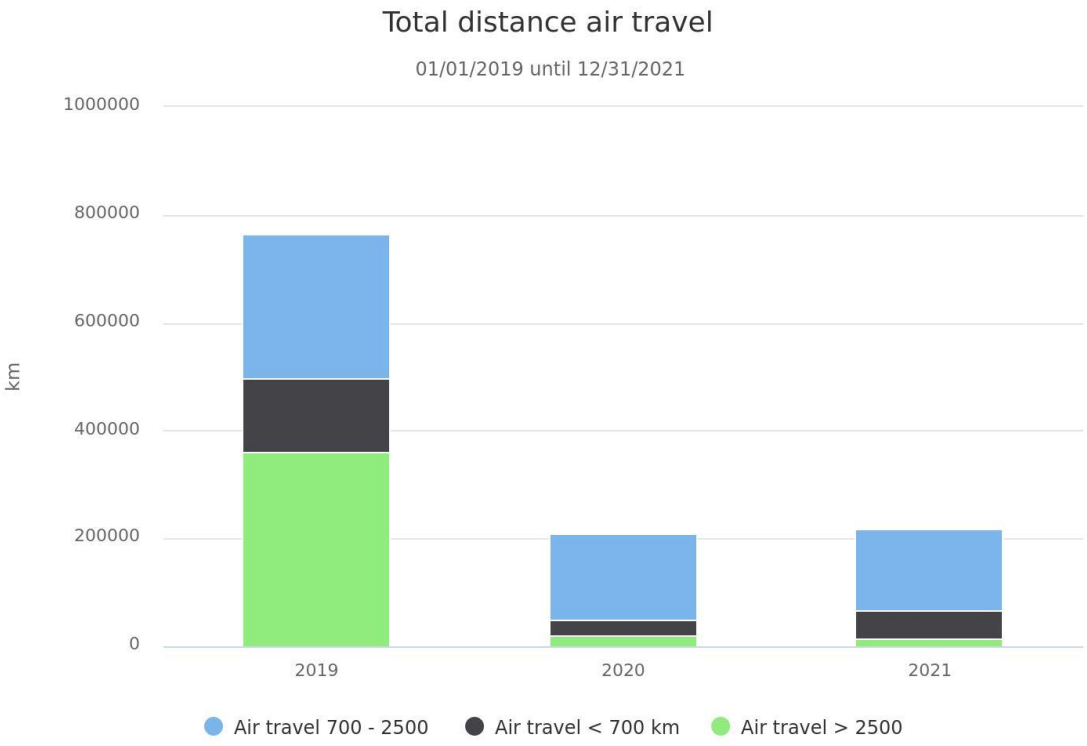

Figure 8 - Air travel distances

CO_2 emission by Air travel (tonne)	2019	2020	2021
Intercontinental, > 2500 km	54	32	31
Regional, 700 – 2500 km	40	9	15
Europe, < 700 km	53	3	2
Total	**147**	**44**	**48**

Table 7 - Air travel CO_2 emissions

7.2 Private cars for business travel

In 2021 the emissions from personal cars for business travel account for 5% of overall emissions and 49% in Scope 3. It is a decrease compared with base year 2019, but an increase from 2020.

Compared with the first semester report additional fuel usage and charged electricity for business cars (outside the fuel card) has been split of from the usage for private cars and moved to Scope 1 or Scope 2.

7.3 Public transportation

Also public transportation has been influenced by the COVID-19 measures. In 2021, Alfen employees travelled 64,000 passenger kilometers, an increase (>75,000 km) compared with 2020.

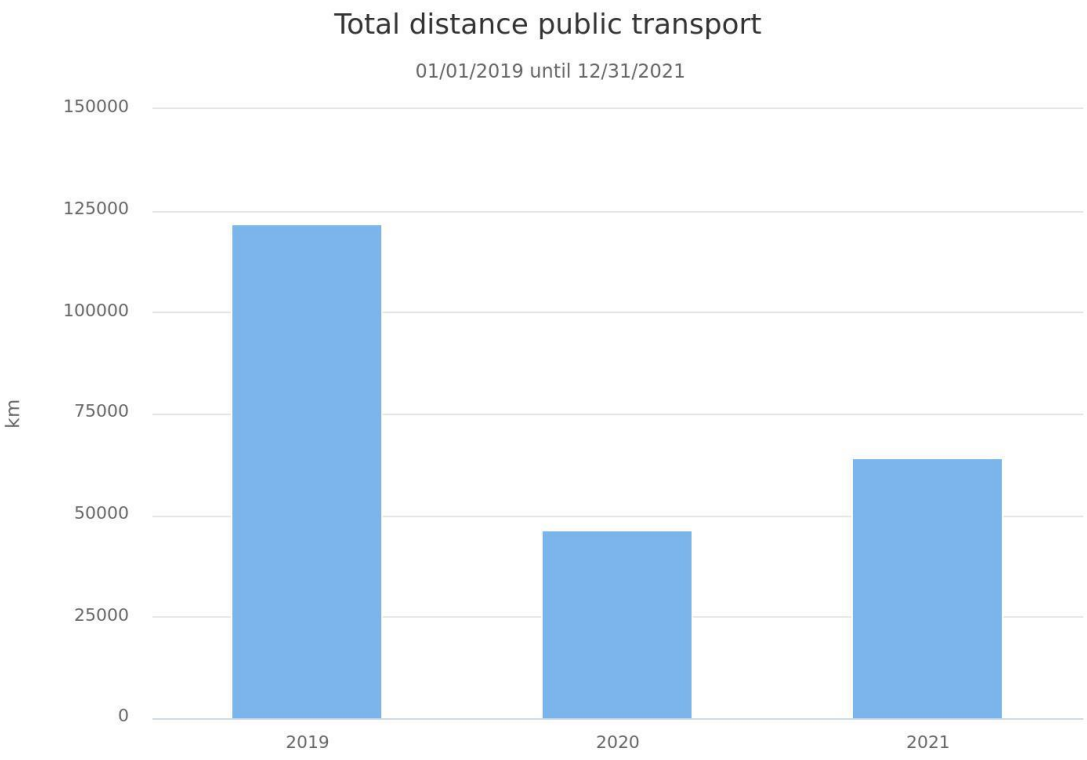

Figure 9 - Total distance public transport

8 Trend over the years by category

Figure 10 shows the trend by category for all emissions in Scope 1, Scope 2 and business travel in Scope 3 over the last three years.

In comparison with 2019 the most notable changes are:
Building related emissions:

- electricity, reduction related to the switch to renewable energy for all buildings;
- heating, increase related to the increase in number of buildings.

Mobility related emission:

- air travel, reduction due to COVID-related measures;
- lease cars, reduction due to COVID-related measures and increase number of electric vehicles. See further explanation below.

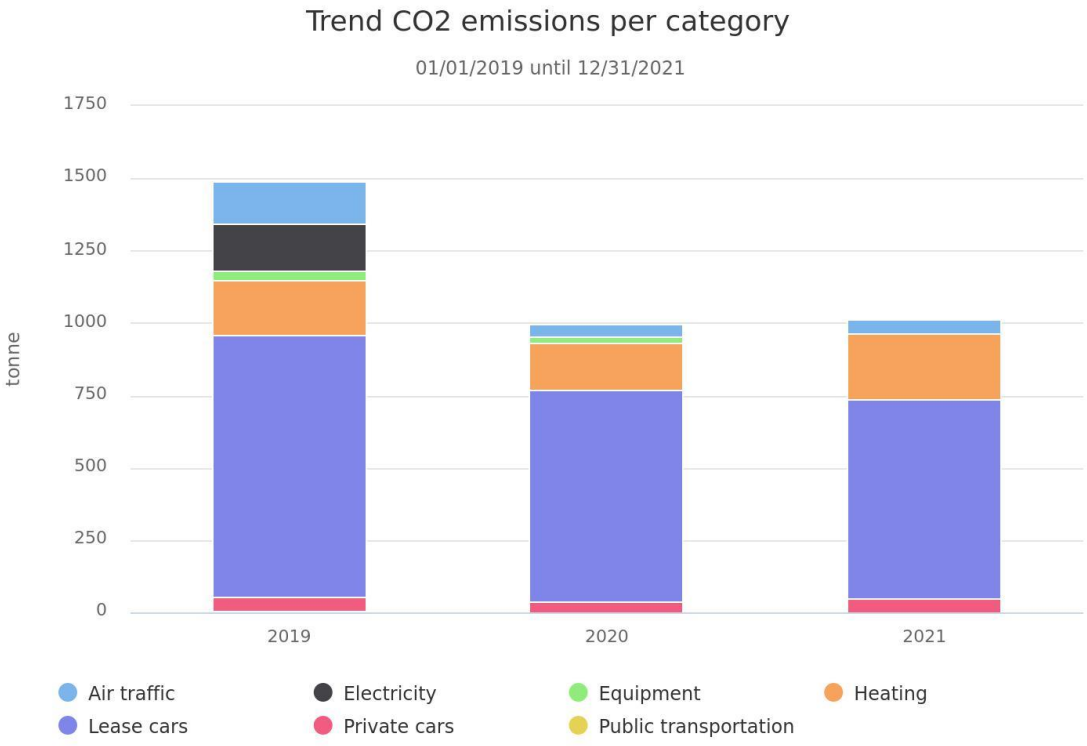

Figure 10 - Trend CO_2 emission per category

Lease cars have always been the largest contributor to Alfen's CO_2 emissions, but looking at the emissions per lease car, a decrease is visible as result of COVID-19 measures and the increase in the share of EV-vehicles. This is visualised in Figure 11.

In 2021 19 new vehicles are leased, with an average emission of 85 grams CO_2/ km according to actual emission data [206].

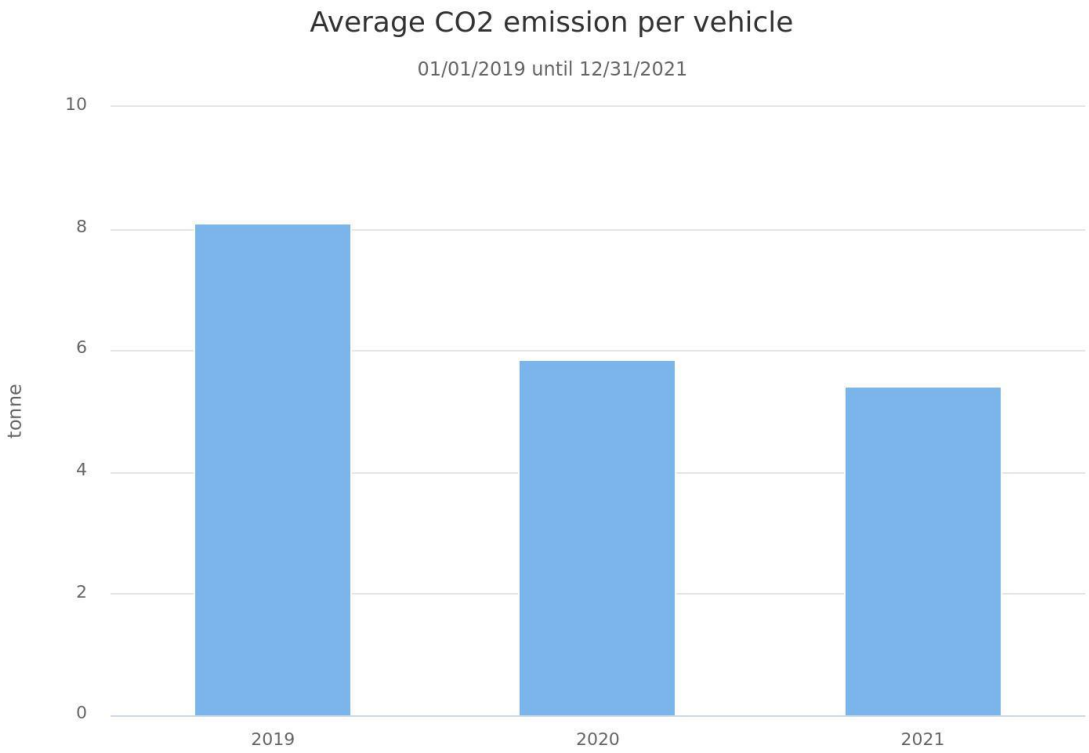

Figure 11 - Average CO_2 emission per vehicle

9 Reduction targets and progress

This chapter provides an update on the progress of the reduction targets in Scope 1, Scope 2 and business travel in Scope 3.

9.1 Reduction targets

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.

For 2021 the objective is to keep the CO_2 emissions per FTE maximum/ at least the same as in 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.
Besides this, Alfen's general aim is to reduce energy consumption and increase the share of electric/ hybrid vehicles.

The performance indicators are expressed as a reduction in the ratio of carbon dioxide emissions relative to FTE and are based on the year 2019 and historical results and planned actions. Compared to previous reports the emission per FTE is recalculated to the average amount of FTE. The KPIs are included in Table 8.

Parameter/ KPI	2019	Target 2021
CO_2e Scope 1/ FTE (tonne)	2.31	+ 0%
CO_2e Scope 2/ FTE (tonne)	0.46	+ 0%
CO_2e Scope 3 BT/ FTE (tonne)	0.44	+ 0%
CO_2e Scope 1+2+3 BT/ FTE (tonne)	3.21	+ 0%

Table 8 - Objectives 2021

9.2 Progress CO2 emission reduction

The emission intensity per FTE reduced with 50% from 3.21 tonnes CO_2e/ FTE in 2019 to 1.59 tonnes CO_2e/ FTE in 2021. This means the objective has been met. The objective for the emission per Scope has also been met with a reduction of 44% for Scope 1, 68% for Scope 2 and 65% for Scope 3 BT emissions. The results are shown in Table 9.
An important factor that contributed to the positive results towards the reductions targets for 2021 is the decrease of the energy consumption by mobility related to the COVID-19 measures. But also the purchase of green electricity in Finland had impact. The effect of other energy reduction measures like replacing of the compressor and replacing outdoor lighting is relative small. The reduction related to the switch to HVO100 is over 30 tCO2e in 2021.
In the half year report a carbon dioxide emissions of about 1,250 tonnes CO_2 was expected. The actual value of 1,014 is even lower.

CO_2 emission (tonne)	2019		2020		2021		Realisation 2021 <-> 2019
Scope 1	1.073	(72%)	854	(86%)	825	(81%)	-23%
Scope 2	214	(14%)	63	(6%)	93	(9%)	-57%
Scope 3 BT	202	(14%)	82	(8%)	96	(10%)	-52%
Total	**1,489**		**998**		**1,014**		**-32%**
Emission CO_2/ FTE Scope 1	2.31		1.50		1.30		-44%
Emission CO_2/FTE Scope 2	0.46		0.11		0.15		-68%
Emission CO_2/ FTE Scope 3 BT	0.44		0.14		0.15		-65%
Emission CO_2/FTE Scope 1,2,3 BT	**3.21**		**1.75**		**1.59**		-50%

Table 9 - Realisation 2021

9.3 Progress share electric vehicles

If the first quarter of 2018 is compared with the last quarter of 2021, we see an increase in the percentage of electric/ hybrid vehicles from 19% in Q1-2018 to 50% in Q4-2021. So this is in line with Alfen's general ambition. This also means that the objective for 2022, a minimum share of (PH)EV of 45% has already been achieved.

10 Conclusions and follow-up

For the period 2020-2022 the objective is to keep the CO_2 emissions per FTE below or equal to 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.
Besides this, Alfen's general aim is to reduce energy consumption and increase the share of electric/ hybrid vehicles. For 2022 the set target is 45% (PH)EV.

Based on the results presented in chapter 7, the conclusion is that the objective has been met with an amount of 1.59 tCO2e/ FTE in total, which corresponds to a reduction of 50% compared to base year 2019. The objective has also been met per Scope. This is partly related to the efforts to reduce energy, but is also a influenced by the measures related to COVID-19, affecting mobility.

In 2021 the emission was 1,014 tonnes CO_2e. This is a reduction of 32% compared to base year 2019, despite an annual 32% business revenue growth.

Actions planned and new defined actions to achieve the objectives are presented in Appendix B. This Appendix also gives an overview of actions completed and the status of current actions.

Other Scope 3 emissions
Alfen aims to gain more insight into the other Scope 3 CO_2 emissions. Because there is a need for additional and more detailed information on the carbon footprint in the value chain it was decided to re-examine significant Scope 3 CO_2 emissions.

In 2022 all preparations will be made to meet the CRSD obligations. If relevant, these are included in the Action plan reduction targets. The aim is to also set Science based targets.

11 Additional information

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

11.1 Methodology

Alfen's carbon footprint analysis for 2021 follows the CO_2 Performance Ladder, and is consistent with the approach adopted in Handbook 3.1.

The CO_2 Performance Ladder is a CO_2 management system; it requires continuous improvement in insight, communication and operational management cooperation, and CO_2 reduction measures. The CO_2 Performance Ladder has five levels, ascending from 1 to 5. In 2021 Alfen is certified at level 4.

To calculate the CO_2 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 CO_2 measurements and assessments, is used.

The quantification of CO_2 emissions in Scope 1 is based on the available activity data for fuels consumed (including natural gas and fuel oil). Scope 2 CO_2 emissions are primarily calculated from metered electricity consumption figures. CO_2 emissions from Business travel in Scope 3 are mainly calculated from activity data from 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. Data are complemented with information of cost declarations.

11.2 Calculation method

The application Smart Trackers uses emission factors from the publicly available website www.co2emissiefactoren.nl (version 22-2-2021), which is recommended by Handbook 3.1 of the CO_2 Performance Ladder.

The figures and conversion factors for 2020 and 2021 have been verified by an external party. This resulted in a few adjustments compared with the half year report and de financial annual report. See 11.2.2.

11.2.1 Changes in calculation method in 2021

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

- In 2021 an update of emission factors related tot fuel usage for vehicles (applicable from 2020) and public transport was implemented.
- From 2021 information in public EV-charging was derived from the suppliers system in stead of manually generated from invoices.

11.2.2 Recalculation of base year and historical data

Compared with 2020 a recalculation of Scope 1 emission in base year 2019 has been performed for diesel and petrol usage by lease cars and diesel usage by equipment due to change to diesel 2015-2019 blend and petrol E10 blend.

Corrections compared to the half year report are:

Lease cars:	the figure for additional declarations for lease-cars has been adjusted, resulting in a higher CO_2 emission for lease cars.
Private cars:	the figure for additional declarations for private cars has been adjusted, resulting in a higher CO_2 emission for private cars.
Public transport:	The value was corrected because of a calculation error.

Besides, the intensity figures have been adjusted tot the average amount of FTE.

11.3 Data quality and completeness

Scope	Emission source	Activity data	Data source	Remarks
1	Natural gas	Primary	Telemetric gas meter readings from energy company and 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 minimise 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.
	Fuel for stationary vehicles and forklifts	Primary	Supplier invoices	
	Fuel oil for heating FI	Primary	Supplier invoices	
	Vehicle fleet	Primary / secondary	Reports from lease company, declarations	Mainly primary data supplemented with costs declarations based on average fuel costs.
	Own electricity production solar panels	Primary	Electricity meter readings solar panels.	
2	Purchased electricity (renewable and nonrenewable sources)	Primary	Telemetric electricity meter readings from energy company and visual readings	Mainly based on telemetric electricity meter readings. Visual readings in Belgium.
	Purchased electricity for lease cars (unknown source)	Primary/ secondary	Reports from suppliers electrical charging (fuel cards), declared costs and information home charging (kWh) ICU Connect.	Home charging 2019: €0,23/ kWh, based on average costs own lease cars. From 2020 home charging has been measured.
	Electricity usage for lease cars (own charging points)	Primary/ secondary	ICU Connect and declarations	Mainly primary data supplemented with costs declarations based on average kWh costs.
	District Heating Finland	Primary data	Meter readings from energy company.	
3	Business travel - private cars	Primary/ secondary	Travel expenses declaration system based on distance generated by google maps, fuel type and car type.	Mainly primary data: the use of private cars is calculated by dividing the travel costs by the official rate of €0,19/km in the Netherlands and Belgium and €0,40/km in Finland. This in combination with selection of vehicle type and fuel type. This data is supplemented with costs declarations based on average fuel costs and €2,80/km for taxis, based on national taxi tariffs (www.rijksoverheid.nl).
	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 €0,19/km. In Finland for public transport €0,40/ km is used.
	Business travel - air	Secondary	Overview of the booking agency and travel expenses	Flight distances are calculated using http://nl.distance.to/. From 2020 information travel company is used.

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

Table 10 - Overview data quality and completeness

Appendices

Number	Title
Appendix A	Carbon Footprint Alfen 2021 by Scope
Appendix B	Appendix BAction plan reduction targets 2021-2022

Appendix A Carbon Footprint Alfen 2021 by Scope

Emissions Scope 1

CO_2e (tonne)	2019	2020	2021
Electricity	0	0	0
Equipment	30	23	3
Heating	189	160	223
Lease cars	852	671	598
Total Scope 1	**1,073**	**854**	**825**

Emissions Scope 2

CO_2e (tonne)	2019	2020	2021
Electricity	160	0	0
Heating	4	3	4
Lease cars	49	60	89
Total Scope 2	**214**	**63**	**93**

Emissions Scope 3

CO_2e (tonne)	2019	2020	2021
Air traffic	147	44	48
Private cars	51	36	48
Public transportation	4	2	1
Total Scope 3	**202**	**82**	**96**

Appendix B Action plan reduction targets 2021-2022

No.	Action	Reduction	KPI	Resources	Responsible	Realisation date	Priority	Status	Explanation Status
Mobility									
2019.02	Mobility policy	n.a.			HR	2020	Medium	closed	Guidelines on mobility are included in our "Lease-regeling" and its appendix on e-driving and our "Reis- en verblijfsregeling". For working from home see action 2021.01. These guidelines will be reviewed a year after the Covid-19 crisis, together with the change in work climate and mobility. Therefor this is action is closed.
2021.01	Development policy for working from home.	n.a.			HR	2021	Medium	closed	Policy in place, introduction depending on COVID-19 measures.
2021.08	In 2022 the share of fully or hybrid electric vehicles is 45%.	unknown	Number of (PH)EV SMTR		MR	2022	Medium	closed	Increase (PH)EV% from 19% at the end of 2017 to 50% in Q4-2021
Buildings, tools and equipment									
2018.01	Research on a possibility to extend the solar panel park.	n.a.			TD/BI	2021	Low	closed	Investigation completed. The solar park will be expanded to appr. 15% of the electricity usage in NL. A new action point (2021.09) is planned for this.
2020.07	NL Electricity reduction measures lighting and ventilation	± 8 *kWh*	Electricity meters NL SMTR	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.
2021.02	NL: Replace compressors HBW*28*	± 4 kWh	Electricity meter HBW28 SMTR	Appr. € 11.600	TD	2021	High	closed	Compressors have been replaced according to the latest technology.
2020.08	NL Gas reduction measures isolation and heating	± 6 tCO_2e	Gas meters NL SMTR	Appr. € 1.500	TD	2021Q4	Medium	closed	All measures are performed.
2021.06	NL: Replacement *and reduction heating* main office by electrical heating *boiler*	unknown	Gas meter HBW28 SMTR		TD	2022	Medium	ongoing	Heating offices adjusted.
2021.07	NL: Roof insulation production area HBW28	unknown	Gas meter HBW28 SMTR	part roof refurb.	TD/ BI	*2022*	Medium	ongoing	Delayed due to problems with the delivery of insulation material and extended to 2022.
2020.09	Policy for electric hand tools	n.a.			QHSE	*2022*	Low	ongoing	Delayed due to resources and extended to 2022.
2021.09	NL: Installation solar panels main building	285.000 kWh/ year purchase	Electricity meter HBW28 SMTR	Appr. € 180.000	TD/BI	2022Q3	Medium	ongoing	