AIM
ALFEN
INTEGRATED
MANAGEMENT
SYSTEM

Carbon Footprint Report 2021-S1

GHG emissions resulting from internal operations (not verified)

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Introduction

This semi-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 the first semester of 2021. It has been prepared in accordance with the version 3.1 of the CO_2 Performance Ladder, the Green House Gas (GHG) protocol and the international standard ISO 14064-1 for greenhouse gases [203]. 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 in context of the CO_2 Performance Ladder 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). Figure 1 shows the CO_2 Scope emissions related to the company.

To determine Alfen's material other Scope 3 emissions, periodically a Scope 3 materiality analysis is performed [106]. Based on the last result, Alfen has chosen to perform a value chain analysis for each product type [104], [105].
Currently these value chain analyses are being updated or drafted, therefore no comprehensive update on the progress is included in this Carbon footprint report.

In chapter 9 this report provides a brief update on the progress of the CO_2-reduction targets.
An overview of methodology and data quality is provided in chapter 11.

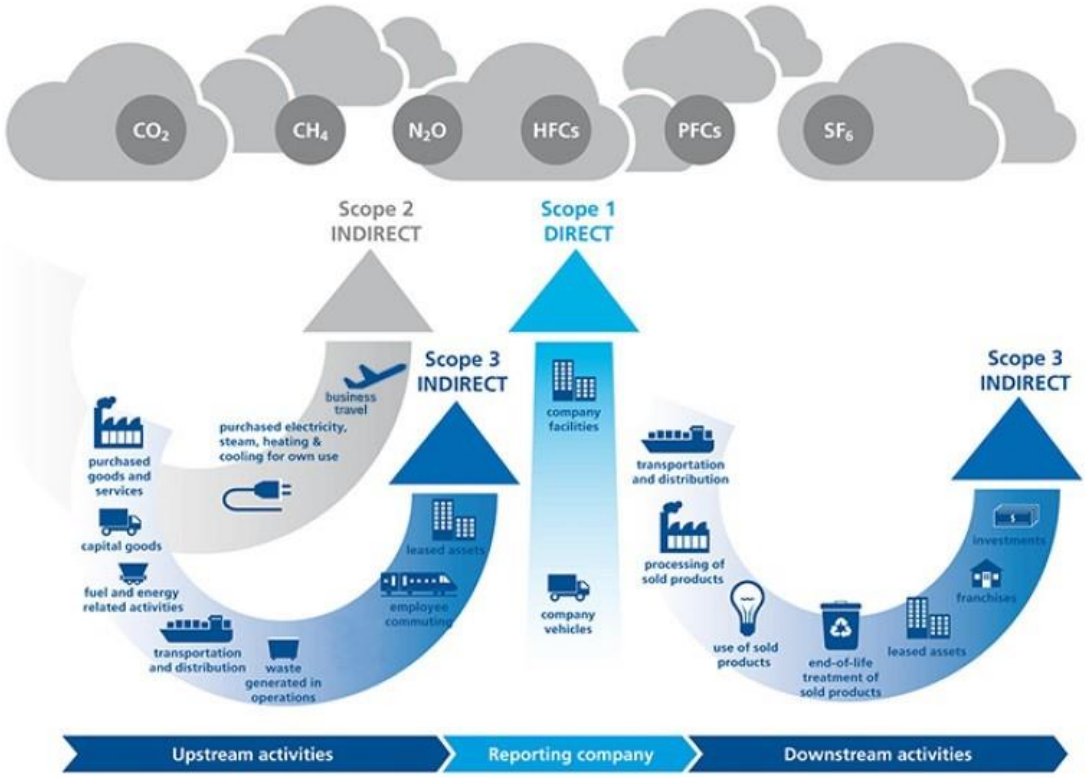

Figure 1 - Scopes Carbon Footprint analysis

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 recognise that the economic activities of our business operations cause carbon emissions. We have full insight into our own carbon footprint and aim to better understand the carbon footprint in the value chain. Our certification at level 4 (out of 5) according to the CO_2 Performance Ladder gives us a method to continuously reduce our CO_2 emissions, improve our insights and achieve our objectives in the field of sustainability.

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 offset this, we have set ourselves the goal to achieve at least equivalent CO_2 emissions per FTE in 2020, 2021 and 2022 compared with 2019. This objective has been set for Scope 1, Scope 2 and Business travel in Scope 3.

During the first semester of 2021 a number of measures are taken to reduce our CO_2 footprint. As of 2021 we use 100% Hydrotreated Vegetable Oil for all our equipment and further increased the share of electric vehicles. In line with our plan additional energy-saving measures have been taken, such as replacing of the compressor and replacing the last outdoor lighting, whereby this lighting consists entirely of LED lighting. Additionally we installed a weather independent regulation for heating at our workshop.

These actions, and the influences related to the ongoing COVID-19 measures, resulted to a reduction in absolute CO_2 emissions in the first semester of 2021 compared to the same period in our base year 2019, despite the company growing with 87% turnover in this period. This applies to all Scopes, as well as the CO_2 emission intensity per FTE. Therefore we are on track to meet our 2021 objective.

Looking forward, Alfen anticipates to further grow the business strongly, but also wants to contribute to achieving zero emissions by 2050, according to the ambitions of the Paris Agreement.
For the coming period we planned a number of new measures within the framework of the CO_2 Performance Ladder. For 2022 we also aim to set objectives for 2030 in line with the Science Based Targets.

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
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-1.00-01-MA-03	
[105]	Corporate value chain analysis Alfen Transformer Stations	AIM-QHSE-GEN-1.00-01-MA-02	
[106]	"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]	Handbook CO_2 Performance Ladder		Version 3.1
[202]	GHG Protocol		2011
[203]	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
[204]	"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. About 620 employees are working within Alfen.

Based on the CO_2 emissions in the year 2020 Alfen is categorised as a medium-size company under the CO_2 Performance Ladder [201].

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 [202]. 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 585 FTEs at 31 December 2020 to 620 FTEs at 30 June 2021.

There is no change in legal boundaries compared to the year 2019.

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-S1 is Mr. M. Roeleveld, CEO of Alfen N.V.

3.4 Reporting period

The reporting period covers January 01, 2021 until June 30, 2021, with base year 2019.

3.5 Verification

The figures and used conversion factors for the CO_2 footprint for the first semester have not been verified by an external party.

4 Carbon footprint 2021-S1

The carbon footprint of Alfen includes all emissions in Scope 1, Scope 2 and Business travel in Scope 3. Alfen's total emissions in the first semester of 2021 are equivalent to 491 tCO_2e. A breakdown by function is given in Figure 2.

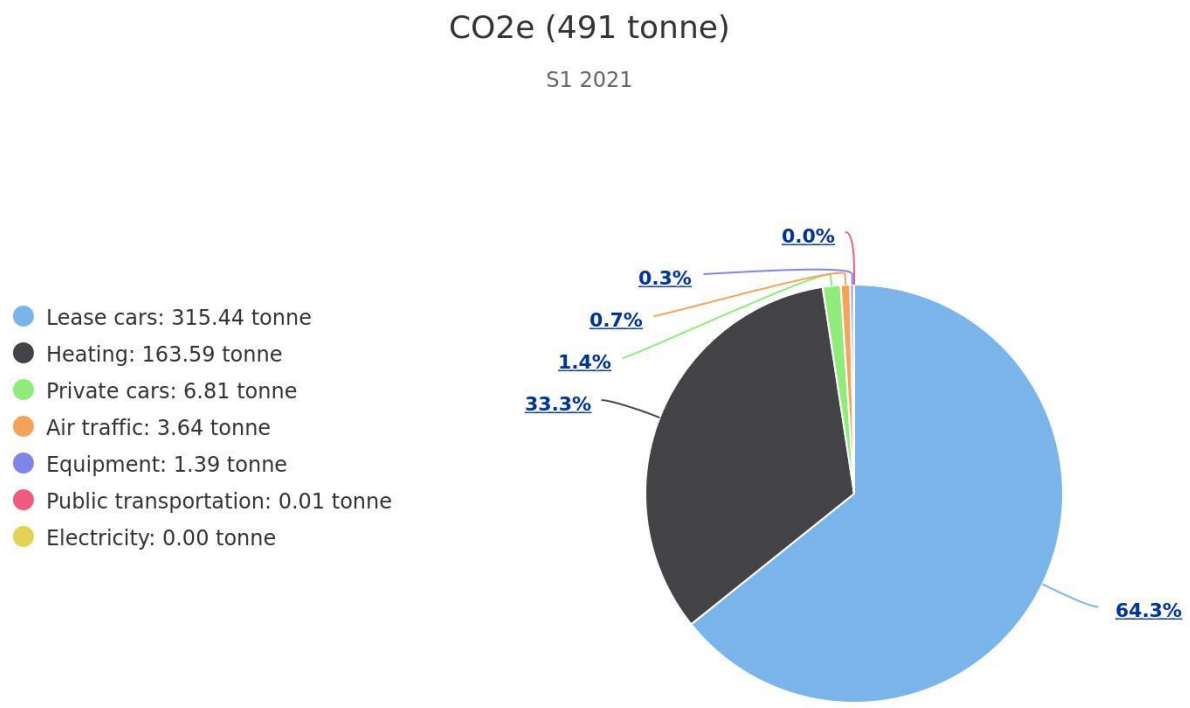

Figure 2 - Alfen Carbon Footprint 2021-S1

From 2018, there has been an increasing growth in total CO_2 emissions. This is as a consequence of the continued growth of the business, the number of production sites and the number of employees. As a result of the COVID-19 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 the first semester of 2021 with the footprint in the same period in 2019 shows a decrease of 35%. 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-S1, direct emissions accounted for 443 tonnes of the CO_2 emitted by Alfen, a quantity of 90% of the total carbon emissions. This is a decrease of 17% compared to the year 2019 and is comparable to 2020-S1.

The direct emissions are a product of fuel powered lease cars (company-owned vehicles), stationary equipment and heating (natural gas for all locations 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.

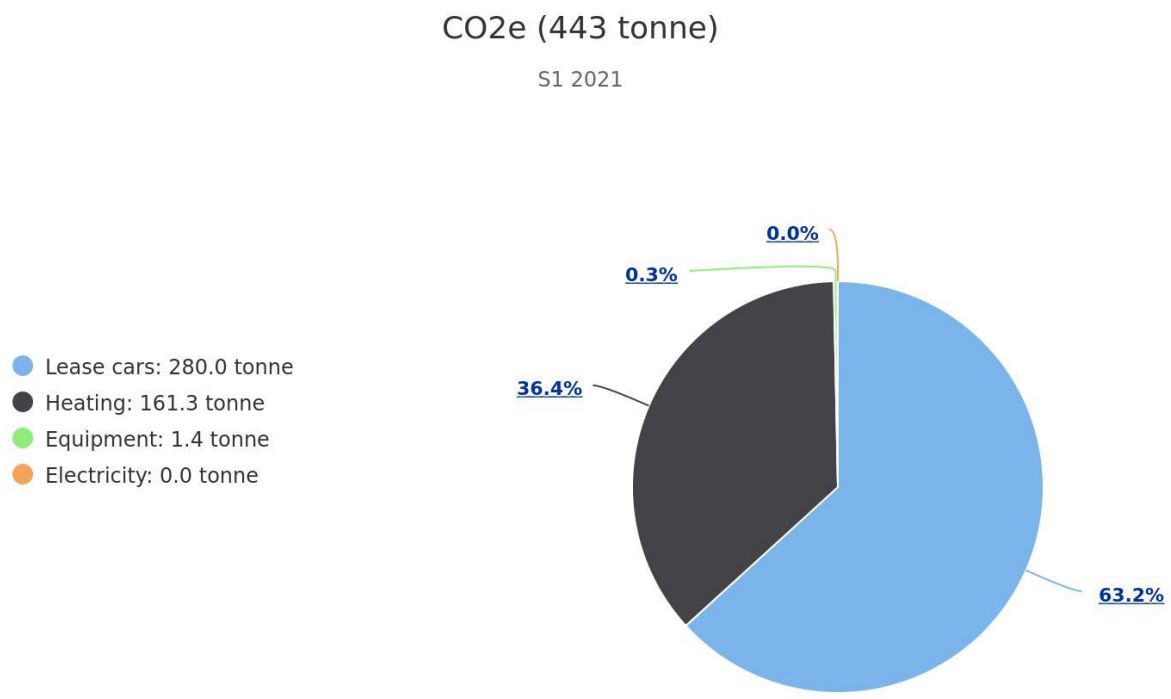

Figure 3 - Breakdown of Scope 1 CO_2 emissions 2021-S1

5.1 Equipment

Diesel fuel consumption by equipment, like stationary vehicles and forklifts, contributed 0.3% of the carbon footprint in Scope 1 and constitutes of 1.4 tonnes of total CO_2 emissions.

Carbon emissions related to equipment are lower than in 2019 due to the switch to 100% Hydrotreated Vegetable Oil (HVO 100) as of 2021. HVO 100 is a vegetable diesel that reduces carbon dioxide emissions from diesel consumption by 89% compared to regular diesel.

In the first semester the achieved reduction is 13 tCO_2e.

5.2 Heating

In 2021-S1 heating for all buildings contributed 36% of the Carbon footprint in Scope 1 and constitutes of 161 tonnes of the total CO_2 emissions This is a 41% increase (47 tCO_2e) compared to 2019-S1 and a 68% increase (65 tCO_2e) compared to 2020-S1.

This increase is related to the refilling of light fuel oil in Finland in the first semester and the fact that this was not refilled in 2020. So the consumption value for 2021-S1 also applies to 2020.

Building-related emissions are influenced by higher employee numbers, the increase of building area with commissioning of the significant larger building for EV-charging offices and production facility per June 2020 and the installation of gas heating in the rental warehouse in combination with the relative cold winter months in 2021.

5.3 Lease cars (vehicle fleet)

The vehicle fleet, consisting of lease cars and vans, accounts for the majority (55%) of all Alfen net emissions, contributing 280 tCO_2e in Scope 1. Electricity usage for lease cars (35 tCO_2e and 7%) is part of Scope 2.

5.3.1 Number of lease cars

The Alfen vehicle fleet (including Belgium and Finland) consists of 127 vehicles by the end of 2021-S1. Figure 4 and Table 5 give an overview of the vehicle fleet since 2017.

At the end of the first semester the majority of the fleet is still fuel-powered vehicles (68 vehicles in total of which 37 vans), however this number is steadily decreasing. The total number of fully electrical and petrol powered hybrid electrical vehicles (PHEV) increased to 59. This corresponds with 46% of the total vehicle fleet.

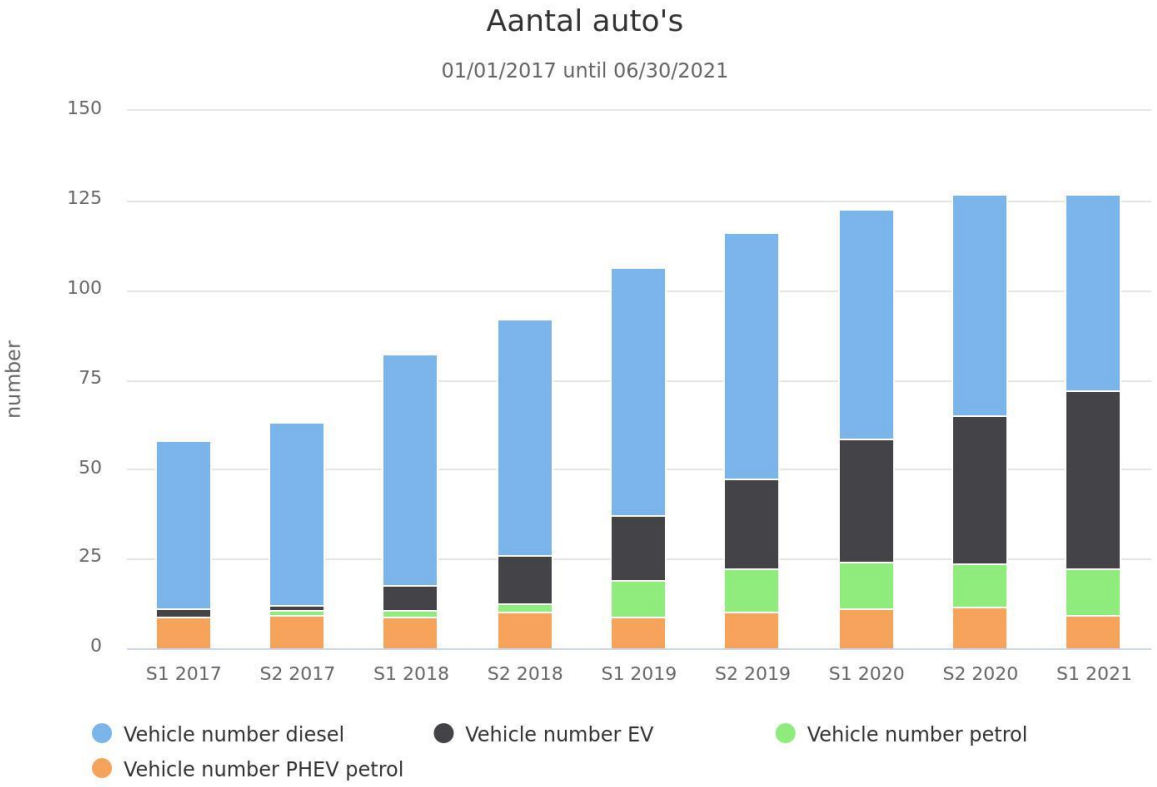

Figure 4 - Number of vehicles since 2017

Number of vehicles	S1-2017	S2-2017	S1-2018	S2-2018	S1-2019	S2-2019	S1-2020	S2-2020	S1-2021
Diesel	47	51	65	66	69	69	64	62	55
EV	2	2	7	14	18	25	35	42	50
Petrol	0	1	2	3	10	13	13	12	13
PHEV petrol	9	10	9	10	9	10	11	12	9
Total	**58**	**64**	**83**	**93**	**106**	**117**	**123**	**128**	**127**

Table 5 - Number of vehicles since 2017

5.3.2 Fuel usage 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 has decreased. This is visualised in Figure 5.

Compared to the previous report, the fuel usage for 2020 has been adjusted, as 1 meter has been moved from lease cars in scope 1 to private cars in scope 3.

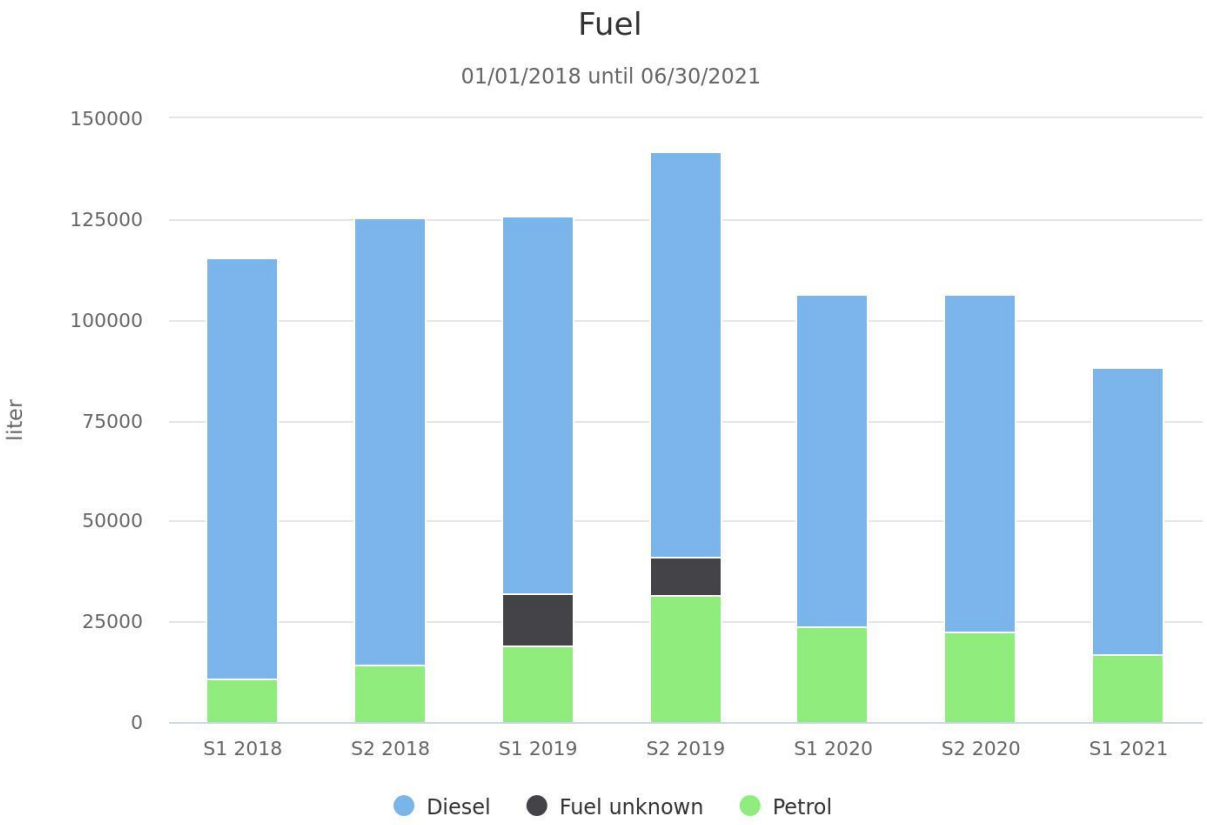

Figure 5 - Fuel-consumption lease cars

5.4 Refrigerants

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

6 Scope 2 - Indirect CO_2 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 the first semester of 2021 the emissions in Scope 2 contribute 38 tCO_2e, a quantity of 8% of the total carbon dioxide emissions. This is a decrease of 65% compared to the same period in 2019. However, this emission is higher than the 29 tCO_2e in 2020-S1.
Main reason for the decrease is the switch to renewable energy (wind energy) in Finland since 2020. The increase in the first semester is related to the increase in the number of electric powered lease cars.

Figure 6 shows a breakdown of Scope 2 emissions in 2021-S1. The different topics are explained in the following sections. Chapter 8 gives the trend over the past years.

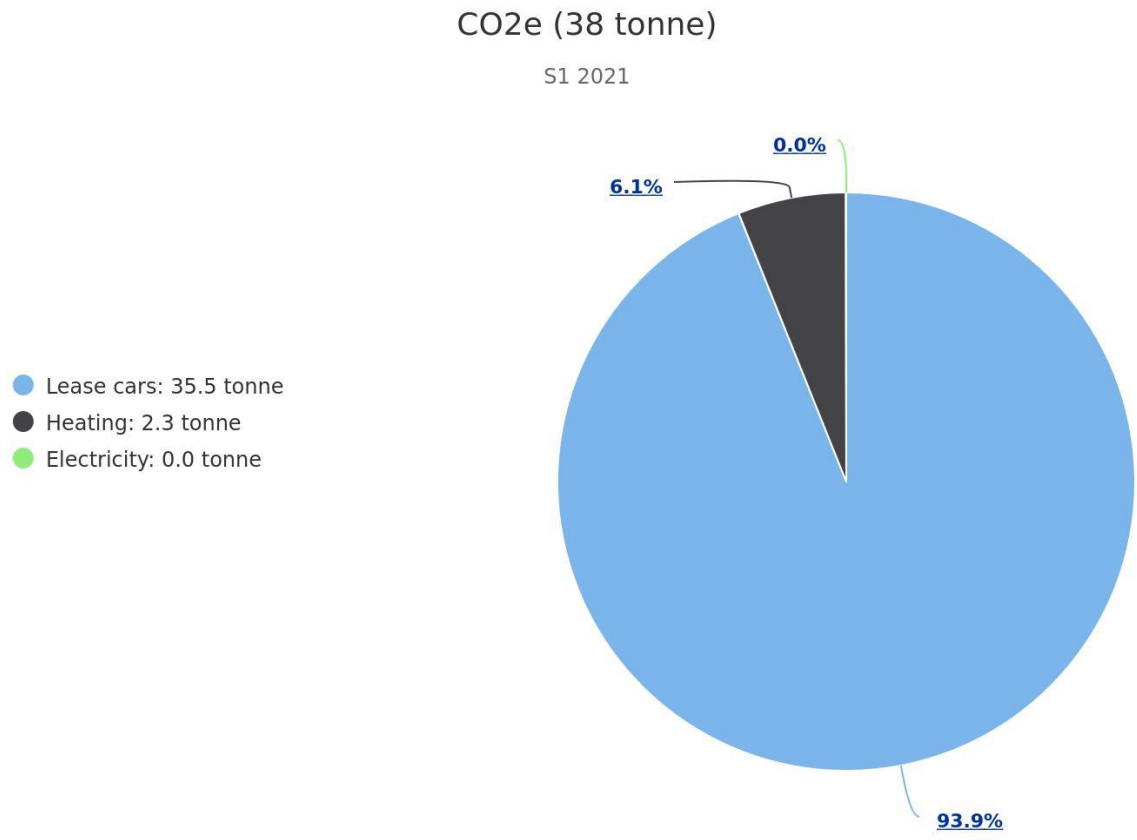

Figure 6 - Breakdown Scope 2 CO_2 emissions 2021-S1

6.1 Electricity consumption Building related

Since 2020, 100% of the Scope 2 electricity used originated from renewable sources covered by green Guarantees of Origin. This means Alfen uses 100% renewable electricity for all buildings with zero CO_2 emissions.

Looking at the consumption values, since 2020 an increase of the electricity consumption of Alfen's facilities is noticed. This is largely due to the opening of the significant larger location for EV-charging offices and production facility in June 2020 and the increase in testing activities for energy storage systems.

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 94% of the Scope 2 emissions.

Table 6 gives information about electricity usage for EV-charging. A majority of 54% of the electricity is generated from Alfen charging points, 21% from home charging and 25% from public charging. Combined with the 39% share of EV cars this makes 21% of the use by lease cars CO_2 emission-free.

EV-charging	CO_2 emission (tonnes)		Electricity usage (kWh)	
Public charging	19.5	(55%)	35,098	(25%)
Home charging	15.9	(45%)	28,680	(21%)
Own charging points	0.0	(0%)	74,847	(54%)
Total	**35.5**		**138,625**	

Table 6 - EV-charging 2021-S1

6.3 District heating

Heating in Scope 2 relates to district heating in Finland.
The consumption in the first semester of 2021 is comparable with the same period in 2019 and 2020.

7 Scope 3 - indirect CO_2 emissions from Business travel

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 the first semester of 2021 these emissions contributed 10 tCO_2e, a quantity of 2% of the total carbon dioxide emissions. This is a 91% decrease from 2019 and also a 46% decrease from 2020-S1. Main reason for this decrease is the reduction in mobility due to the COVID-19 measures. A further explanation is given in the following sections.

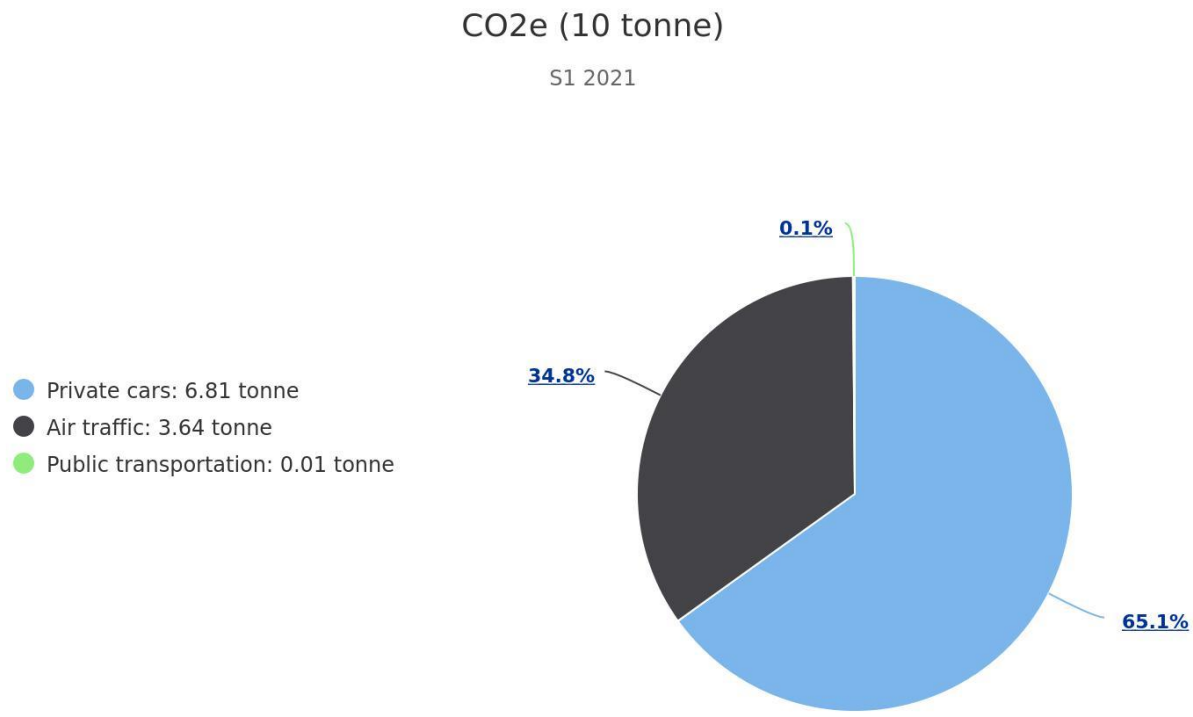

Figure 7 - Breakdown Scope 3 CO_2 emissions for Business travel 2021-S1

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 70% from 81 tCO_2e in 2019-S1 to 4 tCO_2e in 2021-S1.

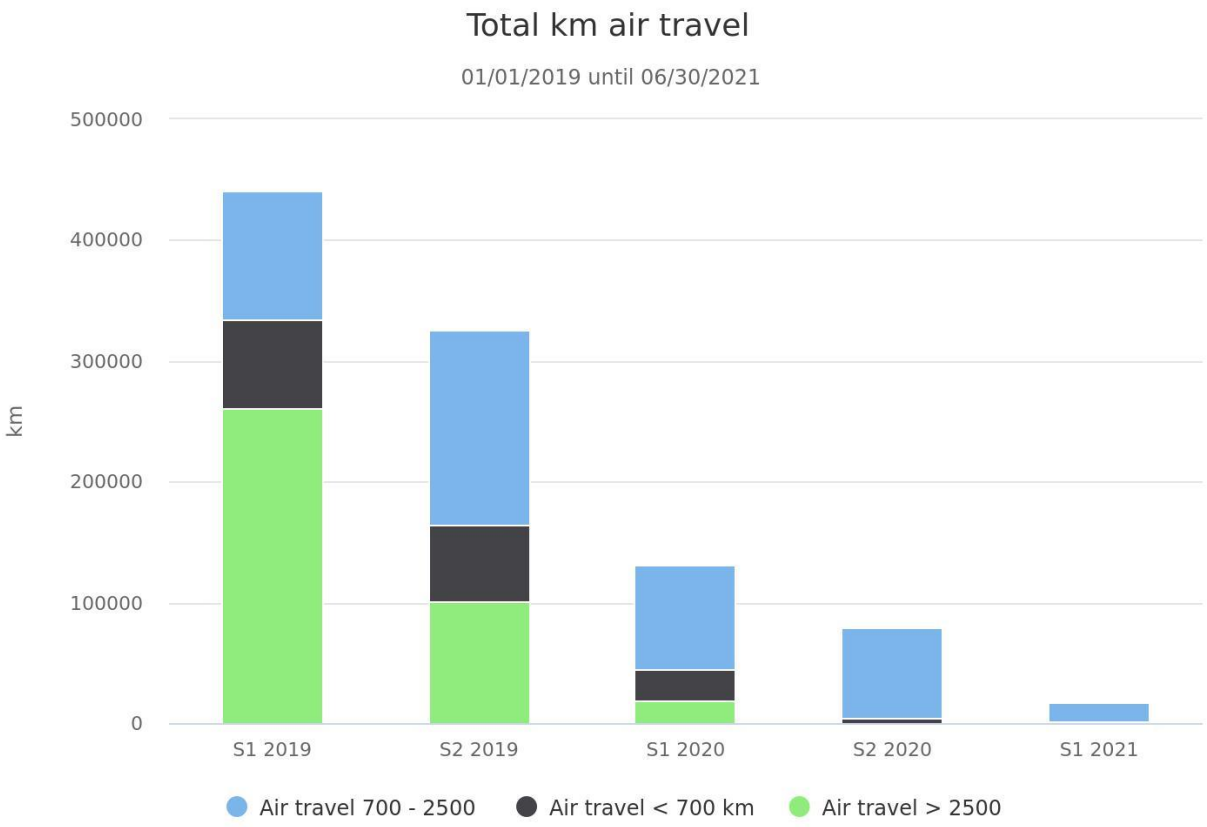

Figure 8 - Air travel distances

CO_2 emission by Air travel (tonne)	2019-S1	2019-S2	2020-S1	2020-S2	2021-S1
Intercontinental, > 2500 km	38	15	3	0	0
Regional, 700 – 2500 km	21	32	18	15	3
Europe, < 700 km	22	19	7	1	0
Total	**81**	**66**	**28**	**16**	**4**

Table 7 - Air travel emissions

7.2 Private cars for Business travel

In the first semester the emissions from personal cars for business travel account for 1% of overall emissions and 65% in Scope 3.
Compared to the 2020 carbon footprint report, the value for 2020 has been adjusted, since 1 meter has been moved from lease cars in scope 1 to private cars in scope 3.

7.3 Public transportation

Also public transportation has been influenced by the COVID-19 measures. In 2021-S1 Alfen employees travelled just 919 passenger kilometers, a 62% decrease (>75,000 km) compared to the same period last year. The CO_2 emissions from travel via public transport are therefore negligible.

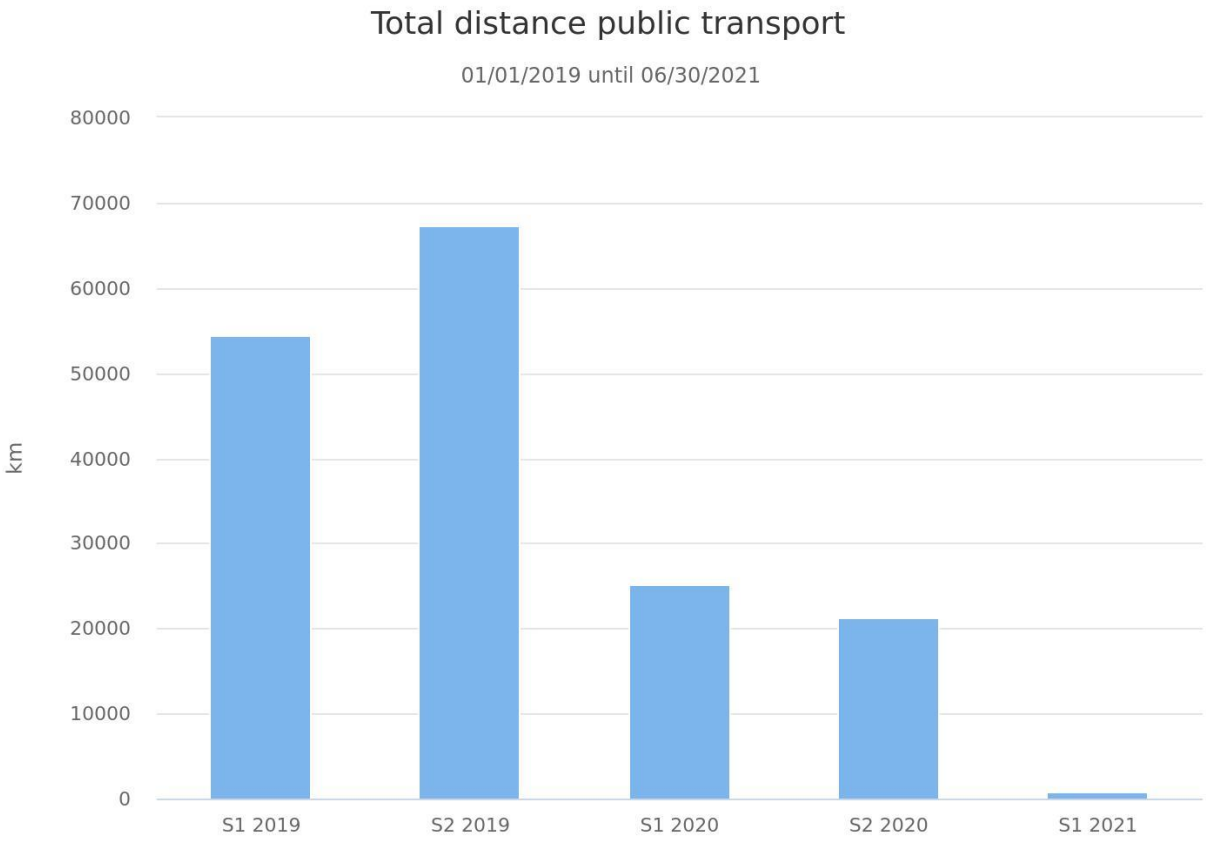

Figure 9 - Total distance public transport

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 since 2019-S1.

Compared to 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 on page 24.

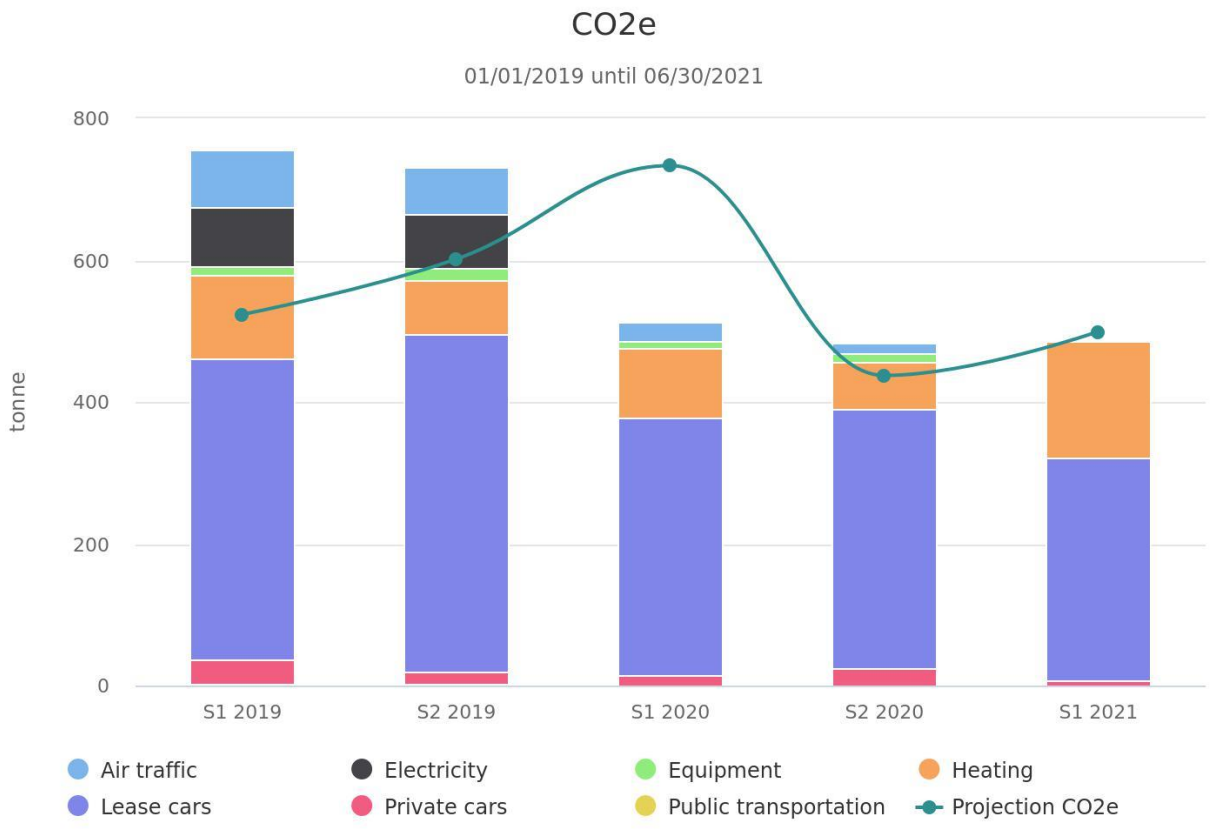

Figure 10 - Trend CO_2 emission per category

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 the increase in the share of EV-vehicles. This is visualized in Figure 11.

Last year, 23 new vehicles are leased, with an average emission of 64.7 grams/ km according to actual emission data [204].

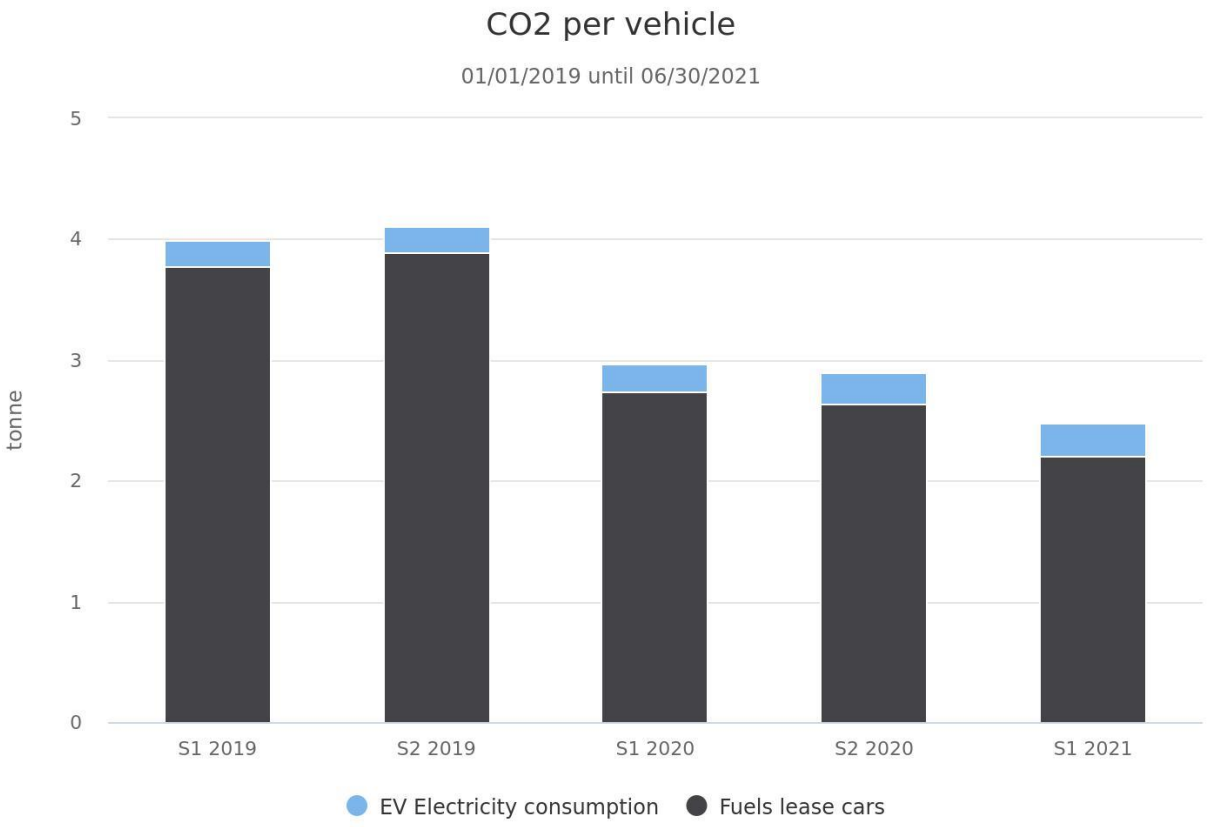

Figure 11 - CO_2 emission per vehicle for lease cars

9 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.

For the years 2020, 2021 and 2022 the objective is to keep the CO_2 emissions per FTE 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 Scope 1, Scope 2 and Business travel in Scope 3. Based on the calculated emission in 2019, the absolute target for 2021 is a maximum emission of 1,489 tonnes of CO_2.

Besides this, Alfen's general aim is to reduce energy consumption and increase the share of electric/ hybrid vehicles to 45 percent in 2022.

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. The KPIs are included in Table 8.

Parameter/ KPI	2019	2019-S1	Target 2021
CO_2e Scope 1/ FTE (tonne)	2.2	1,2	+ 0%
CO_2e Scope 2/ FTE (tonne)	0.4	0,3	+ 0%
CO_2e Scope 3 BT/ FTE (tonne)	0.4	0,3	+ 0%
CO_2e Scope 1+2+3BT/ FTE (tonne)	3.3	1,7	+ 0%

Table 8 - Objectives 2021

9.1 Progress CO_2 emission reduction

The emission intensity per FTE has decreased by 51% from 1.7 tons of CO_2e/FTE in 2019-S1 to 0.8 tons of CO_2e/FTE in 2021-S1. This is in line with the objective for 2021. With a reduction of 17% for Scope 1, 65% for Scope 2 and 91% for Business Travel in Scope 3 the emission intensity per Scope is also in line with the set objectives. The results are shown in Table 9.

An important factor that contributed to the positive results towards the reduction targets for 2021-S1 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 13 tCO_2e in the first semester of 2021.

With an expected re-increase of mobility related activities in the second semester of 2021, the total absolute carbon dioxide emissions are estimated at 1,200 tonnes CO_2e.

CO_2 emission (tonne)	2019	2019-S1		2021-S1		Realised 2021-S1 <-> 2019-S1
Scope 1	1.073	530	(70%)	443	(90%)	-17%
Scope 2	214	109	(16%)	38	(8%)	-65%
Scope 3 BT	202	117	(14%)	10	(2%)	-91%
Total	**1.489**	**757**		**491**		**-35%**
Emission CO_2/ FTE Scope 1	2.2	1,2		0.7		-68%
Emission CO_2/FTE Scope 2	0.4	0,3		0.1		-86%
Emission CO_2/ FTE Scope 3BT	0.4	0,3		0.0		-96%
Emission CO_2/FTE Scope 1,2,3BT	**3.3**	**1,7**		**0.8**		-76%

Table 9 - Objective realisation 2021-S1

9.2 Progress share electric vehicles

We see an increase in the percentage of electric and hybrid vehicles from 19% at the end of 2017 to 46% in Q2-2021. 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 been met.

10 Conclusions and follow-up

Scope 1, Scope 2 and business travel in Scope 3
For the years 2020, 2021 and 2022 the objective is to keep the CO_2 emissions per FTE 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 Scope 1, Scope 2 and Business travel in Scope 3.

For 2021 this corresponds to a year emission of 3.3 tCO_2e/ FTE and 1.2 tCO_2e/ FTE for the first semester from which 1.2 tCO_2e/ FTE in Scope 1, 0.3 tCO_2e/ FTE in Scope 2 and 0.2 tCO_2e/ FTE for Business travel in Scope 3.

Based on the progress results presented in chapter 9, it is concluded that the emission intensity for the first semester with an amount of 0.8 tCO_2e/FTE is in line with the target for 2021. We see a reduction for all Scopes, so the emission intensity per Scope is also in line with the set targets.
These results are partly related to the efforts to reduce energy, but are also a influenced by the measures related to COVID-19, affecting mobility.

Based on the calculated emission in 2019, the aim for 2021 and 2022 is a maximum emission of 1,489 tonnes of CO_2e.

Actions planned and new defined actions to achieve the objectives are presented in Appendix B. This Appendix also gives an overview of actions completed in S1-2021 and the status of current actions.
The aim is to develop Science-based targets in 2022.

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-S1 follows the CO2 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. Alfen is positioned 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 a declaration system is used from which these data can be directly derived.

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 the first semester of 2021 have been not been verified by an external party.

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

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.

Other corrections for the first semester are:

Lease cars:	the figure for additional declarations for lease-cars has been adjusted, resulting in a lower CO_2 emission for lease cars and a higher emission for private cars in 2020.
Fuel oil:	emission factor corrected to heating oil.

11.3 Data quality and completeness

Scope	Emission source	Activity data	Data source	Remarks
1	Natural gas	Primary data	Telemetric gas meter readings from energy company and visual readings.	From 2018 data main building is based on gas meter telemetric meter readings. For other buildings the measurement of data does not relate to the entire reporting period. To minimalize 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 data	Invoices from diesel supplier	
	Fuel oil for heating FI	Primary data	Invoices from supplier	Based on the refueling moments.
	Vehicle fleet	Primary data/ secondary data	Reports from lease company, declarations	Mostly primary data supplemented with declarations.
	Own electricity production solar panels	Primary data	Electricity meter readings solar panels.	From 2020 to April 2021 defected inverter.
2	Purchased electricity (renewable and nonrenewable sources)	Primary data	Telemetric electricity meter readings from energy company.	
	Purchased electricity for lease cars (unknown source)	Primary/ secondary data	Reports from suppliers electrical charging (fuel cards), declared costs and information home charging (kWh) ICU Connect.	In 2019 electricity consumption for home charging is based on the average costs of own lease cars: €0,23/ kWh. From 2020 home charging has been added.
	Electricity usage for lease cars (own charging points)	Primary data	ICU Connect	
	District Heating Finland	Primary data	Meter readings from energy company.	
3	Business travel - private cars NL , BE	Primary data	Travel expenses declaration system based on distance generated by google maps, fuel type and car type.	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. This in combination with selection of vehicle type and fuel type.
	Business travel - private cars and public transport FI	Secondary data	Travel expenses	In Finland for the use of private cars and public transport 0,43 €/km is used.
	Business travel - public transport NL, BE	Secondary data	Travel expenses declaration system	The use of public transport (taxis excluded) is calculated by dividing the travel costs by the official rate of 0,19 €/km . In Finland for public transport 0,43 €/km is used. For taxi's an average cost of 2,80 €/km is used, based on national taxi tariffs (www.rijksoverheid.nl).
	Business travel - air	Secondary data	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 by Scope
Appendix B	Action plan reduction targets

Appendix A Carbon Footprint Alfen by Scope

Emissions Scope 1

CO_2e (tonne)	2019-S1	2019-S2	2020-S1	2020-S2	2021-S1
Electricity	0	0	0	0	0
Equipment	14	17	11	12	1
Heating	115	75	96	64	161
Lease cars	401	451	336	336	280
Total Scope 1	**530**	**543**	**442**	**411**	**443**

Emissions Scope 2

CO_2e (tonne)	2019-S1	2019-S2	2020-S1	2020-S2	2021-S1
Electricity	83	77	0	0	0
Heating	2	2	2	1	2
Lease cars	24	26	27	32	35
Total Scope 2	**109**	**104**	**29**	**34**	**38**

Emissions Scope 3, Business Travel

CO_2e (tonne)	2019-S1	2019-S2	2020-S1	2020-S2	2021-S1
Air traffic	81	66	28	16	4
Private cars	34	17	13	23	7
Public transportation	2	2	1	1	0
Total Scope 3	**117**	**85**	**42**	**40**	**10**

Appendix B Action plan reduction targets

No.	Action	Reduction	KPI	Resources	Responsible	Realisation date	Priority	Status	Explanation Status
Mobility									
2019.02	Mobility policy	n.a.			HR	*2020*	Medium	overdue, ongoing	Integrated action 2019.02 to 2019.05.
2021.01	Development policy for working from home.	n.a.			HR	2021	Medium	ongoing	Planned for 2021.
2021.08	In 2022 the share of fully or hybrid electric vehicles is 45%.	unknown	Number of (PH)EV SMTR		MR	2022	Medium	ongoing	Included in 2021 as a separate action point for 2022. We see an increase in the percentage of electric and hybrid vehicles from 19% at the end of 2017 to 46% in Q2-2021. This is in line with Alfen's general ambition and means that the objective for 2022 has been met.
Buildings, tools and equipment									
2018.01	Research on a possibility to extend the solar panel park.	n.a.			TD/BI	2021	Low	ongoing	In 2021 the solar panel park will be expanded to approx.. 15% of the electricity usage in NL. A new action point is planned for this
2020.07	NL Electricity reduction measures lighting and ventilation	± 8 *kWh*	Electricity meters NL SMRT	Appr. € 2.300	TD	2021Q4	Medium	ongoing	Outdoor lighting has been expanded to 100% LED.
2021.02	NL: Replace compressors HBW*28*	Ca. 4 kWh	Electricity meter HBW28 SMRT	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 SMRT	Appr. € 1.500	TD	2021Q4	Medium	ongoing	60% measures performed, latest action is the installation of a weather dependent regulation for heating in the workshop.
2021.06	NL: Replacement heating main office by electrical heating	unknown	Gas meter HBW28 SMRT		TD	2022	Medium	new	
2021.07	NL: Roof insulation production area HBW28	unknown	Gas meter HBW28 SMRT	part roof refurb.	TD/ BI	2021	Medium	new	
2020.09	Policy for electric hand tools	n.a.			QHSE	2021	Low	ongoing	