AIM
ALFEN
INTEGRATED
MANAGEMENT
SYSTEM

Carbon Footprint Report 2020

GHG emissions resulting from internal operations (verified)

AIM-QHSE-GEN-0.00-01-RP-03

19-Mar-21 | Revision 0

ALFEN
POWER TO ADAPT

Document data

Rev.	Purpose	Date	Initiated	Checked	Verified	Approved
0	Approved	19-Mar-21	SP	HN	LS	MR

This document is signed digitally.

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

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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 2020. It has been prepared in accordance with the CO_2 Performance Ladder (version 3.1), the Green House Gas (GHG) protocol (a corporate accounting and reporting standard) and the international standard ISO 14064-1 for greenhouse gases. This report contains all subjects from section 9.3.1 of the ISO 14064-1: 2018, subject t excluded. The emission factors (subject t), 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.

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, vehicle fleet and equipment.
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 indirect emissions are associated with electricity consumption by company facilities and vehicles (Scope 2) as well as emissions resulting from business travel [1] (Scope 3). 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, including emissions in the corporate supply chain, hereinafter referred to as "other Scope 3 emissions".

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

[1] Until version 3.0 of the CO_2 Performance Ladder, "Business travel" was included in Scope 2.

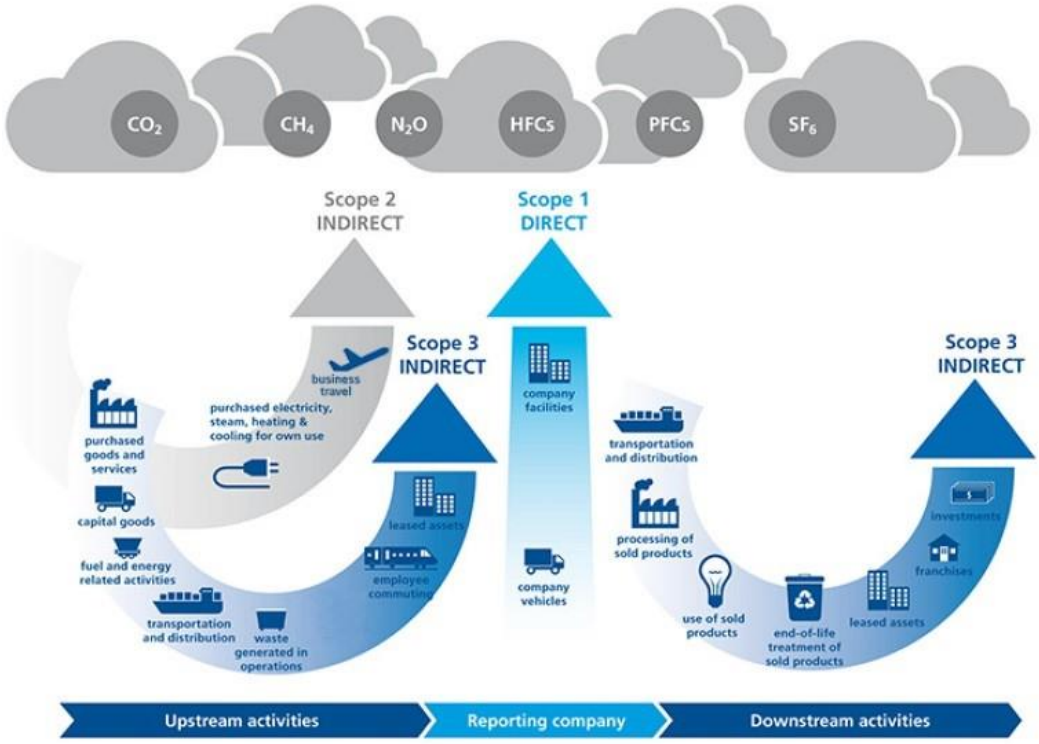

Figure 1 - Scopes Carbon Footprint-analysis

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 increase our CO_2 reduction, 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 had set ourselves the goal to achieve at least equivalent CO_2 emissions per FTE in the period 2020-2022 compared with 2019, despite the 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 where business travel has been moved from Scope 2 to Scope 3.

Various measures have been taken in 2020 to reduce our CO_2 footprint. Alfen Elkamo switched to renewable electricity. Together with the additional purchase of renewable electricity for the new rental property we moved into in June 2020, this means we currently use 100% renewable electricity for all buildings. Also, we installed LED lighting in this new building, implemented the use of Hydrotreated Vegetable Oil for our equipment and further increased the share of electric vehicles. Additionally, COVID-19 measures reduced Alfen's mobility CO_2 emissions as we worked more from home and flights were significantly reduced.

The measures taken, in combination with the influence of COVID-19, resulted in a reduction of the absolute CO_2 emissions in 2020 compared with 2019 for all Scopes, as well as the CO_2 emissions per FTE, even while the business has been growing rapidly with a 32% revenue growth. Therefore, we have achieved our objective for the year 2020.

Looking forward, Alfen anticipates to further grow the business strongly. To also achieve the objective in the next two years, we adopted a number of new measures within the framework of the CO_2 Performance Ladder.

Marco Roeleveld,

CEO of Alfen N.V.

1 Abbreviations & Definitions

1.1 Abbreviations

Abbreviation	Description
AIM	Alfen Integrated Management system
CO_2	Carbon dioxide
EV	Electric Vehicle
FTE	Full Time Equivalent
GHG	Green House Gas
HVO	Hydrotreated Vegetable Oil
PDCA	Plan-Do-Check-Act
PHEV	Plug-in Hybrid Electric Vehicle.

Table 1 - Abbreviations

1.2 Definitions

Definition	Description
Carbon footprint	The greenhouse gas emissions associated with the activities of an entity or individual.
PDCA steering cycle	An iterative four-step management method used in business for the control and continuous improvement of processes and products.
Smart Trackers	Software application for CO_2 emission measurements and assessments.

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, v2	AIM-QHSE-GEN-1.00-01-MA-02	

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

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 580 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 497 FTEs at 31 December 2019 to 584 FTEs at 31 December 2020.

In the Netherlands, at the beginning of the year 2020, heating was installed in the rental warehouse, which affects gas consumption. Furthermore, a significant larger property for EV-charging offices and production facility was taken into use in June.
In Finland during the first semester extra living space was rented for foreign workers, which also influenced gas consumption.
There is no change in the 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 2020 is Mr. M. Roeleveld, CEO of Alfen N.V.

3.4 Reporting period

The reporting period covers January 01, 2020 until December 31, 2020, with base year 2019.

3.5 Verification

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

4 Carbon footprint 2020

The carbon footprint of Alfen includes all emissions in Scope 1, Scope 2 and Business Travel in Scope 3. Alfen's total emissions in 2020 are equivalent to 991 tCO_2e. A breakdown by function is given in Figure 2.

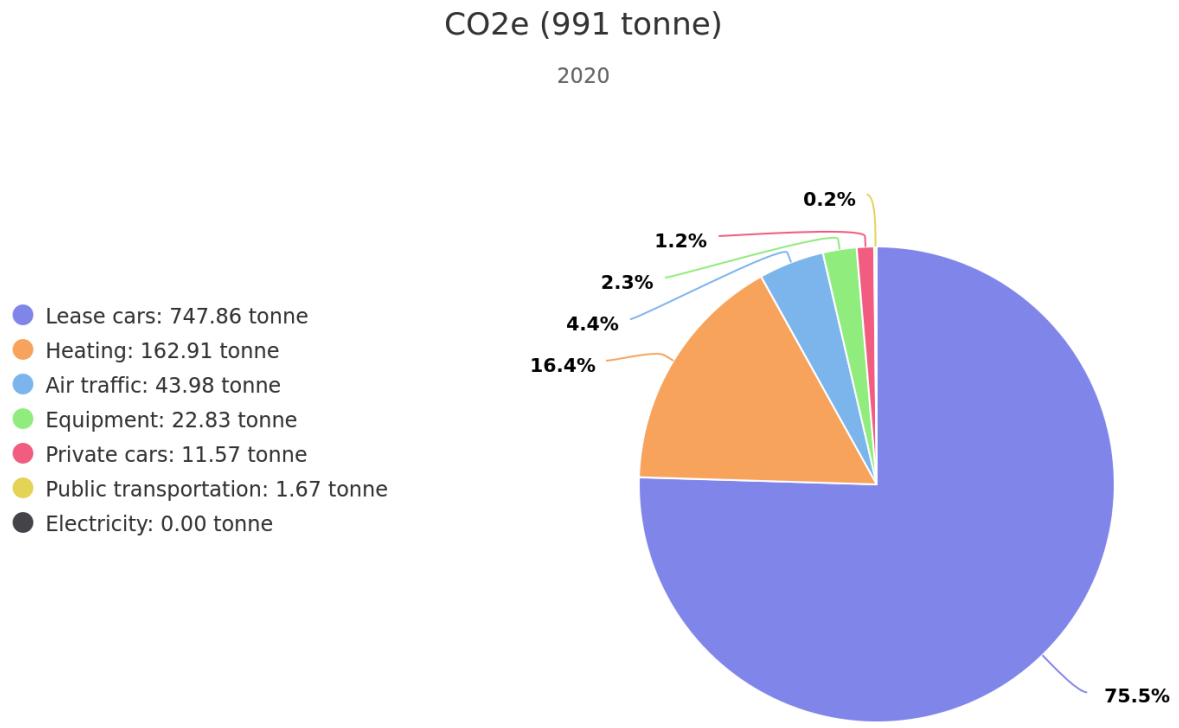

Figure 2 - Alfen Carbon Footprint 2020

In recent years there has been an increase in total emissions. This is as a consequence of the continued growth of the business and the number of employees. As a result of the COVID-19 measures, a break in this trend is observed. This is mainly related to the changes in mobility as a result of working from home.

Comparison of the carbon footprint in 2020 with the footprint in 2019 shows a decrease of 32%. Figure 10 in chapter 8 shows the trend in CO_2-emissions related to function over the past three years.

5 Scope 1 - Direct CO_2 Emissions

In 2020, direct emissions accounted for 871 tonnes of the CO_2 emitted by Alfen, a quantity of 88% of the total carbon emissions. This is a decrease of 17% compared to the 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 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.

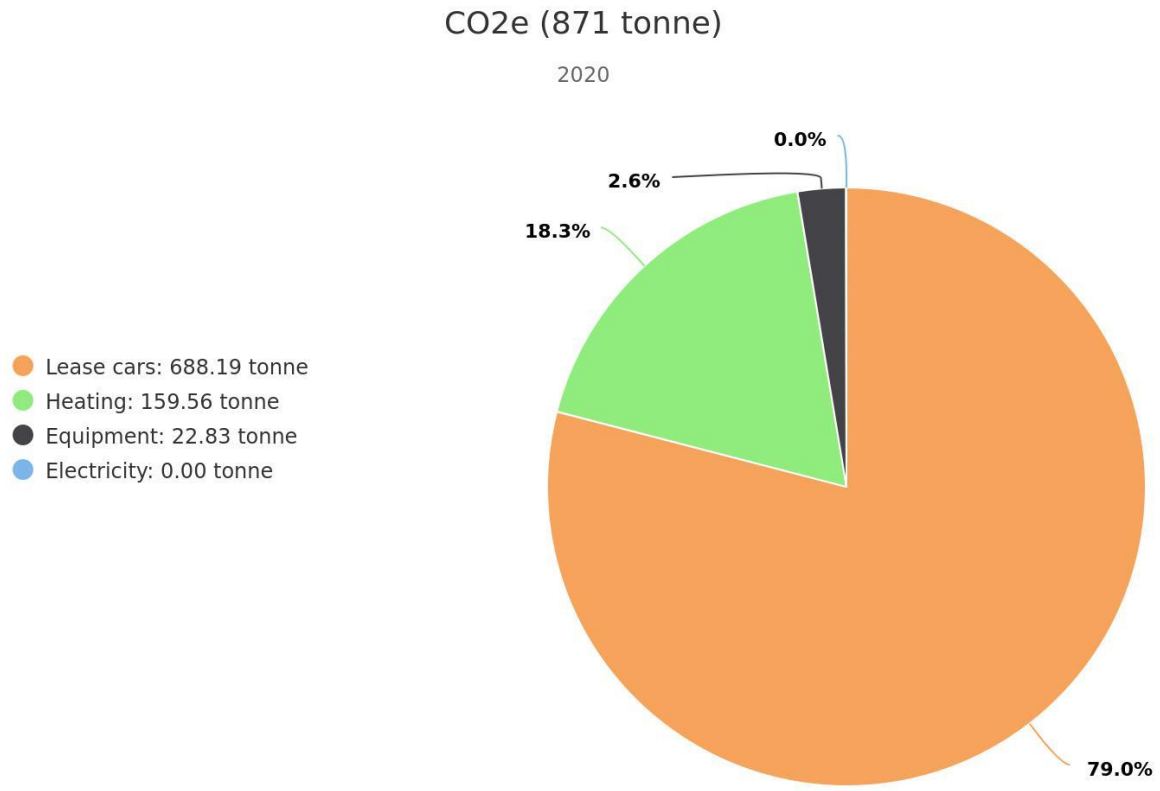

Figure 3 - Breakdown of Scope 1 CO_2-emissions 2020

5.1 Equipment

Diesel fuel consumption by equipment, like stationary vehicles and forklifts, contributed 2.6% of the carbon footprint in Scope 1 and constitutes of 23 tonnes of total CO_2-emissions.

Carbon emissions related to equipment are slightly lower than in 2019 due to the switch to 20% Hydrotreated Vegetable Oil (HVO 20) in the last quarter of 2019. HVO 20 is a blend of vegetable diesel and regular diesel that reduces carbon dioxide emissions from diesel consumption by 18% compared to regular diesel.

5.2 Heating

In 2020 heating for all buildings contributed 18% of the Carbon footprint in Scope 1 and constitutes of 160 tonnes of the total CO_2 emissions. This is a nearly 16% increase (30 tCO_2e) compared to 2019.

Building-related emissions are influenced by higher employee numbers, the 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. Also, in Finland extra apartments are rented for foreign workers.

Remark: In Finland, no light fuel oil was refilled in 2020 and therefore no consumption value was recorded.

5.3 Lease cars (vehicle fleet)

The vehicle fleet, consisting of lease cars and vans, accounts for the majority (75%) of all Alfen net emissions, contributing 688 tCO_2e in Scope 1. Electricity usage for lease cars (60 tCO_2e and 6%) is part of Scope 2.

5.3.1 Amount of lease cars

Since the year 2018, a breakdown of company cars by fuel type is subject to the report. For the year 2020, we see further progress in the growth ratio in fully electrical vehicles from 8% in 2018-S1 to 33% in 2020-S2.

The Alfen vehicle fleet (including Belgium and Finland) consists of 128 vehicles by the end of 2020. Figure 4 gives an overview of the vehicle fleet since 2018.

At the end of 2020 the majority of the fleet is still diesel-powered vehicles (62 vehicles in total of which 34 vans), however this amount is steadily decreasing. The total number of fully electrical and petrol powered hybrid electrical vehicles (PHEV) increased to 54. This corresponds with 42% of the total vehicle fleet.
At the beginning of 2020 a second electric powered van has been added to the vehicle fleet. This means 5.5% of the vans is powered by electricity.

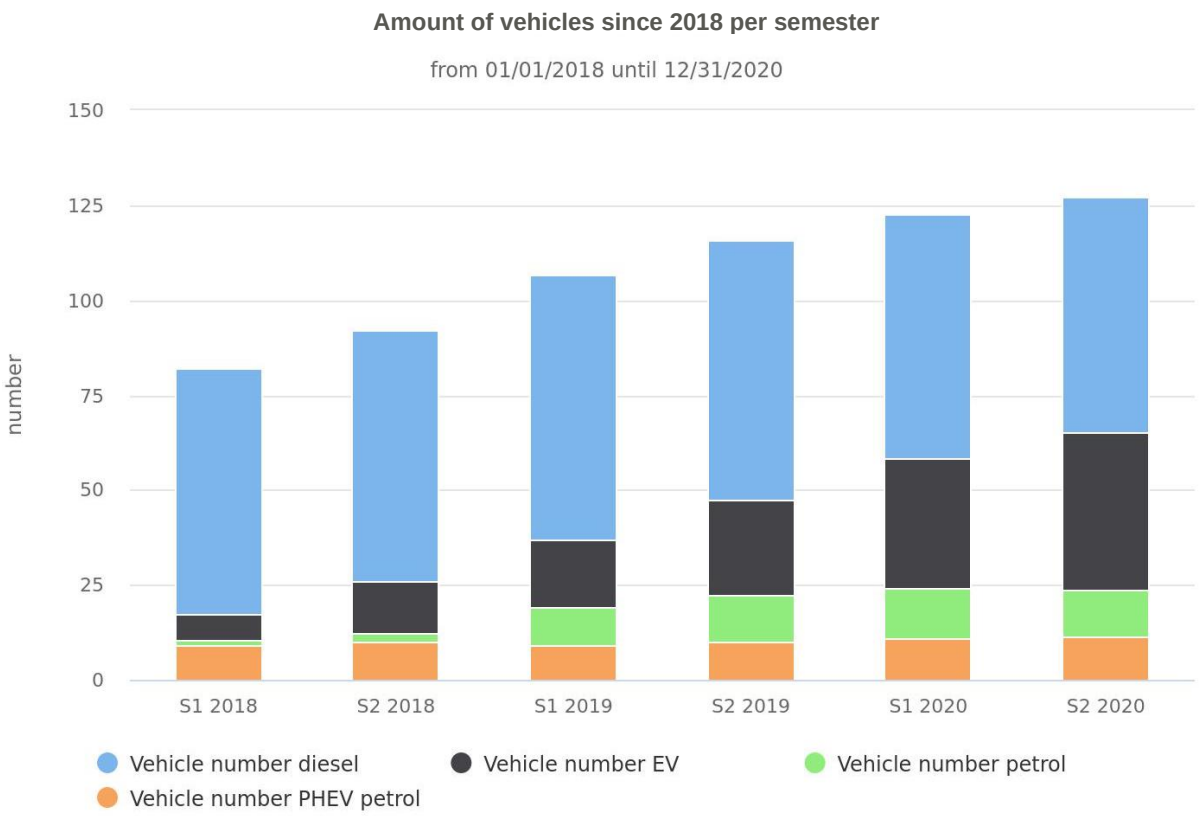

Figure 4 - Amount of vehicles

Amount of vehicles	S1 -2018	S2-2018	S1-2019	S2-2019	S1-2020	S2-2020
Vehicles diesel	65	66	69	69	64	62
Vehicles EV	7	14	18	25	35	42
Vehicles petrol	2	3	10	13	13	12
Vehicles PHEV petrol	9	10	9	10	11	12
Total	**83**	**93**	**106**	**117**	**122**	**128**

Table 5 - Amount of vehicles

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 is comparable to 2019. This is visualised in Figure 5.

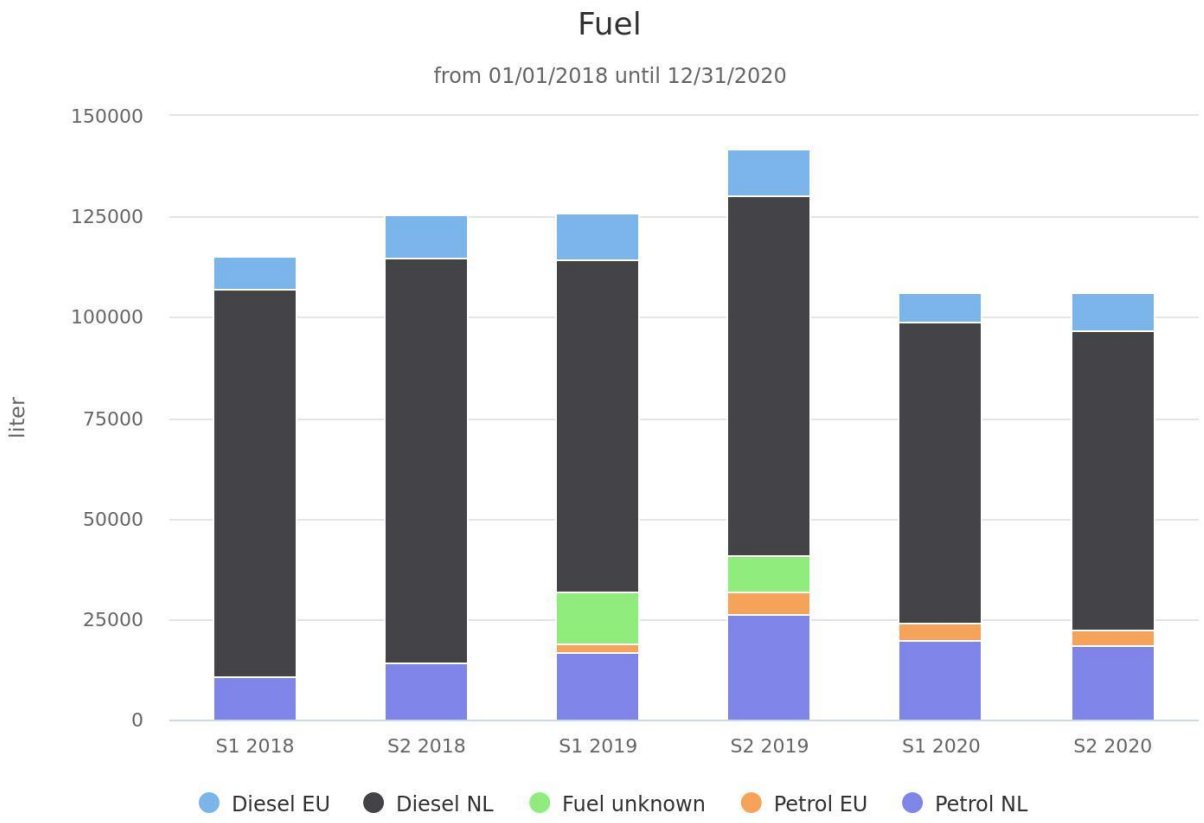

Figure 5 - Fuel-consumption lease cars

5.4 Refrigerants

In the year 2020 no leakage of air conditioning refrigerant has been detected.

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 2020 the emissions in Scope 2 contribute 63 tCO_2e, a quantity of 6% of the total carbon dioxide emissions. This is a decrease of 70% compared to 2019. Main reason for the decrease is the switch to renewable energy (wind energy) in Finland.

Figure 6 shows a breakdown of Scope 2 emissions in 2020. The different topics are explained in the following sections. Chapter 8 gives the trend over the past years.

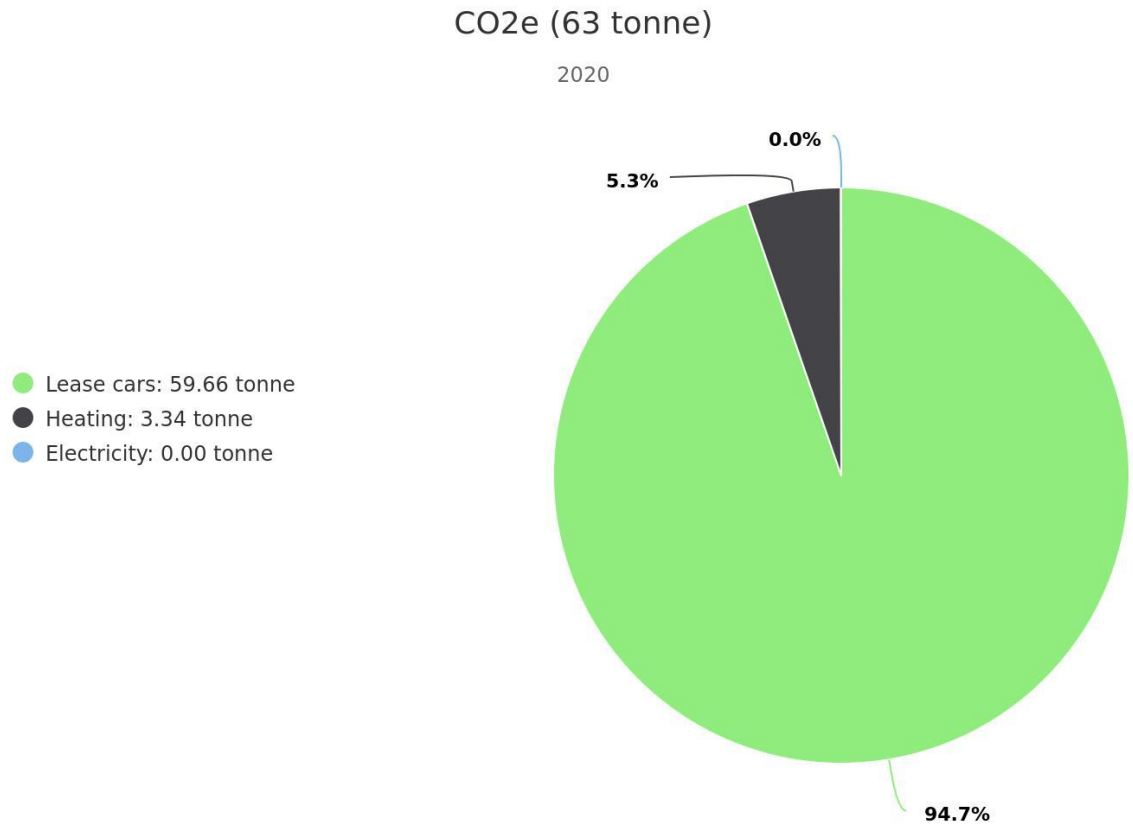

Figure 6 - Breakdown Scope 2 CO_2-emissions 2020

6.1 Electricity consumption Building related

In 2020, 100% of the Scope 2 electricity used originated from renewable sources covered by green Guarantees of Origin. This is significantly more than in 2019, where this contribution was 43%.
This increase has been achieved thanks to the switch to renewable electricity in Finland. Together with the additional purchase of renewable electricity for the new rental property, this means Alfen currently uses 100% renewable electricity for all buildings and zero CO_2-emissions.

Looking at the consumption values, in 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, the increase in testing activities for energy storage systems and the increase of EV-charging via own charging points.

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 95% of the Scope 2 emissions.

Home charging was not included in previous calculations, declarations excepted. Besides it appears that charging at Alfen charging points was not included in the invoices and therefore not calculated. The latter is not relevant for the carbon foot because it concerns green electricity.

Table 6 gives information about electricity usage for EV-charging. A majority of 47% of the electricity is generated from Alfen charging points, 25% from home charging and 28% from public charging.

EV-charging	CO_2-emission (tonne)		Electricity usage (kWh)
Public charging	32	(53%)	57,141
Home charging	28	(47%)	50,166
Own charging points	0	(0%)	95,103
Total	**60**		**202,410**

Table 6 - EV-charging

6.3 District heating

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

7 Scope 3 - Indirect emissions for 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. Previously business travel was classified under Scope 2 emissions.

In 2020 these emissions contributed 57 tCO_2e, a quantity of 6% of the total carbon dioxide emissions. This is a decrease of 71% compared to 2019. Main reason for the decrease is the reduction in mobility due to the COVID-19 measures. A further explanation is given in the following sections.

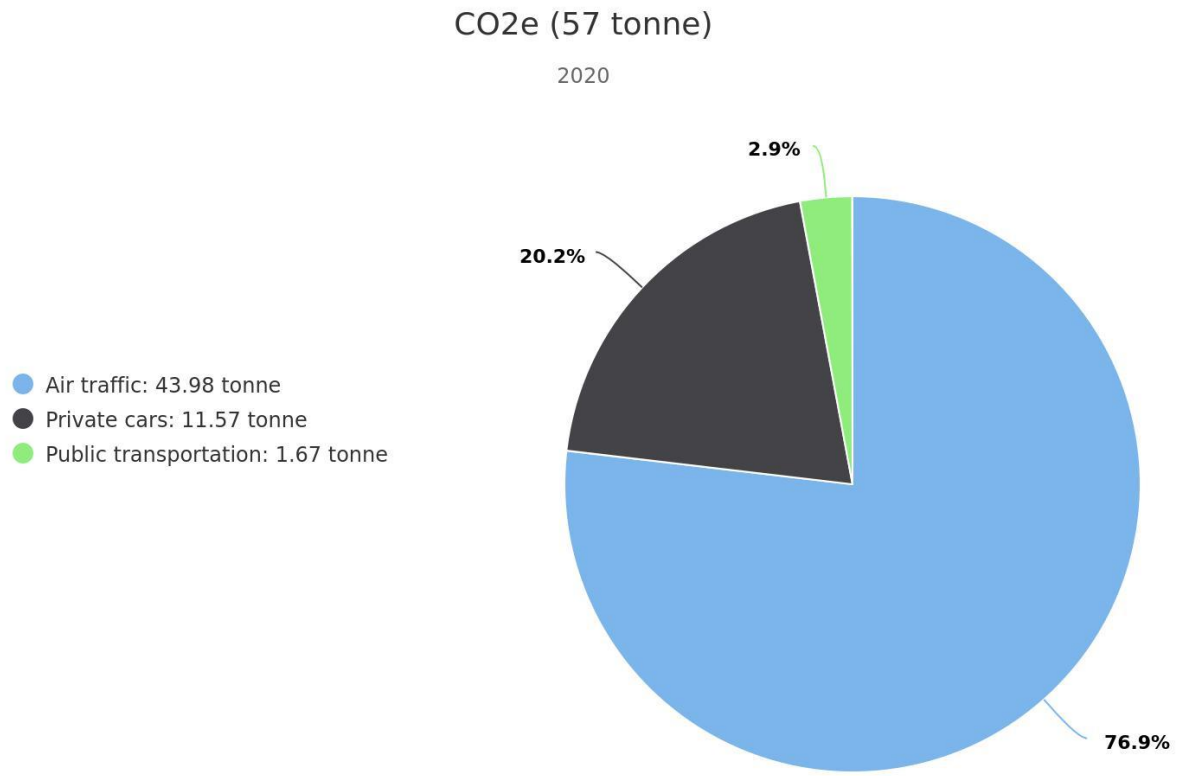

Figure 7 - Breakdown Scope 3 CO_2-emissions 2020

7.1 Air travel

Air travel distances within Alfen and related CO_2-emissions are visualised in Figure 8.
Due to the COVID-19 measures air travel emissions decreased with 70% from 147 tCO_2e in 2019 to 44 tCO_2e in 2020.

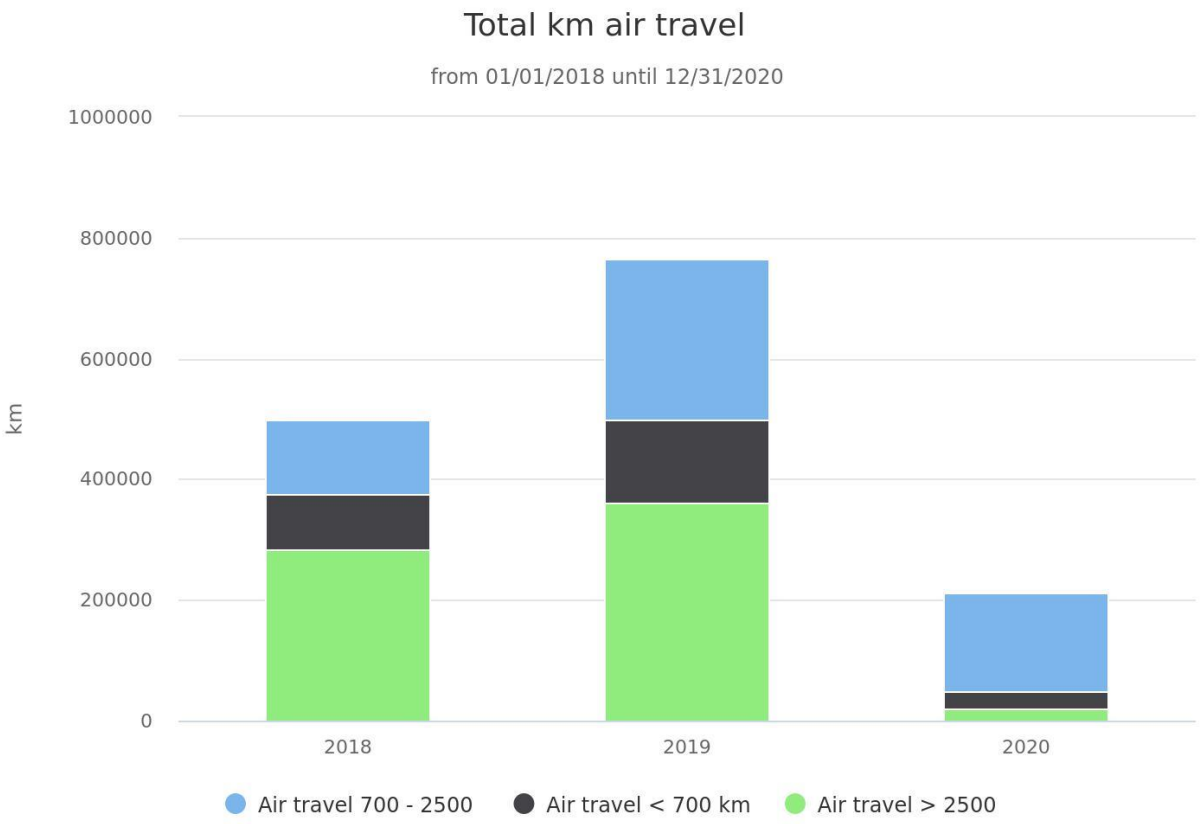

Figure 8 - Air travel distances

CO_2-emission by Air travel (tonne)	99	2019	2020
Intercontinental, > 2500 km	24	54	32
Regional, 700 – 2500 km	28	40	9
Europe, < 700 km	42	53	3
Total	**94**	**147**	**44**

Table 7 - Air travel emissions

7.2 Private cars for business travel

Emissions from personal cars for business travel account for 1.2% of overall emissions and 20% in Scope 3.

A new declaration system was introduced at the end of 2019. This system has been expanded with mandatory fields for the type of car used and the type of fuel. This made it possible to generate this information about vehicles and enabled a more accurate emission calculation for passenger cars.

7.3 Public transportation

The 1.7 tCO_2 emissions resulting from travel via public transport are responsible for just 0.2% of the total emissions.

Also public transportation has been influenced by the COVID-19 measures. In 2020, Alfen employees travelled 46,300 passenger kilometers, a 62% decrease (>75,000 km) compared to the same period last year.

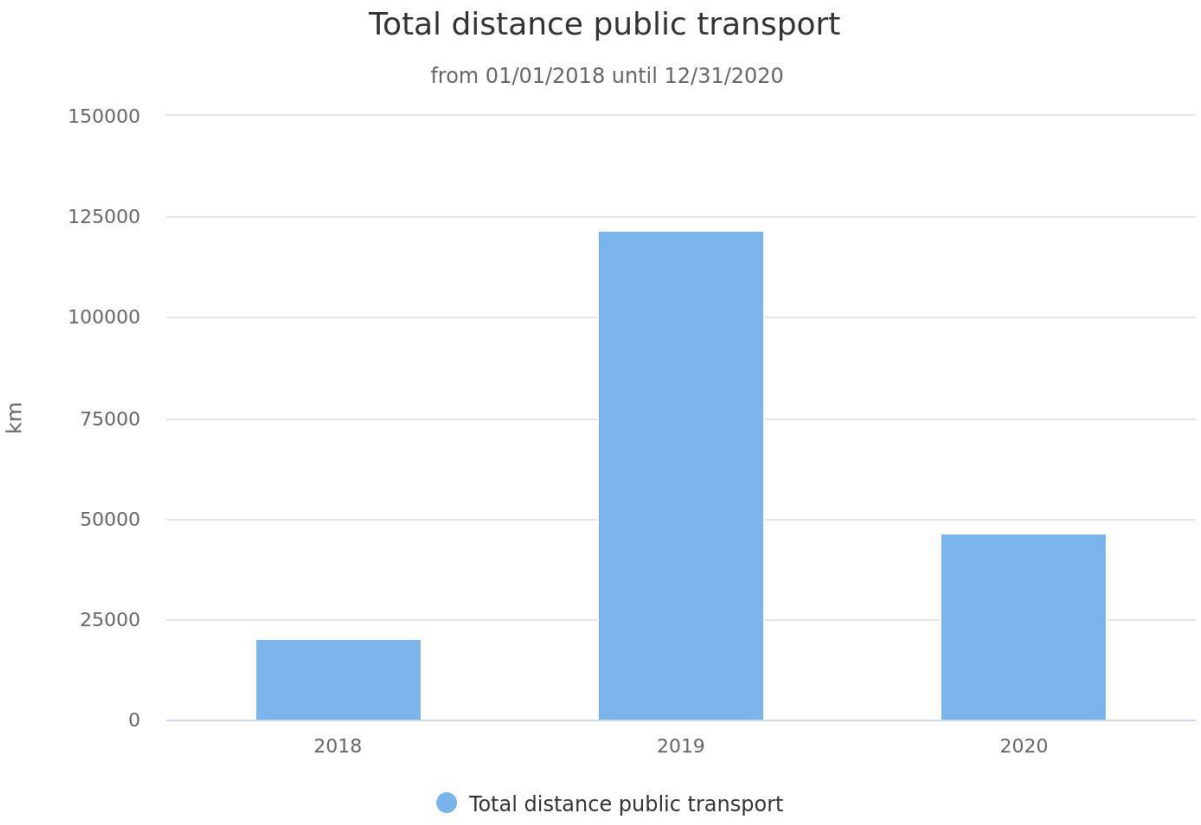

Figure 9 - Total distance public transport

8 Trend over the years by category

Figure 10 shows the trend by function for all emissions in Scope 1, Scope 2 and business travel in Scope 3 over the last three years.
Lease cars have always been the largest contributor to Alfen's CO_2-emissions. Emissions. Compared to 2019 the largest changes are visible in electricity consumptions and air travel.

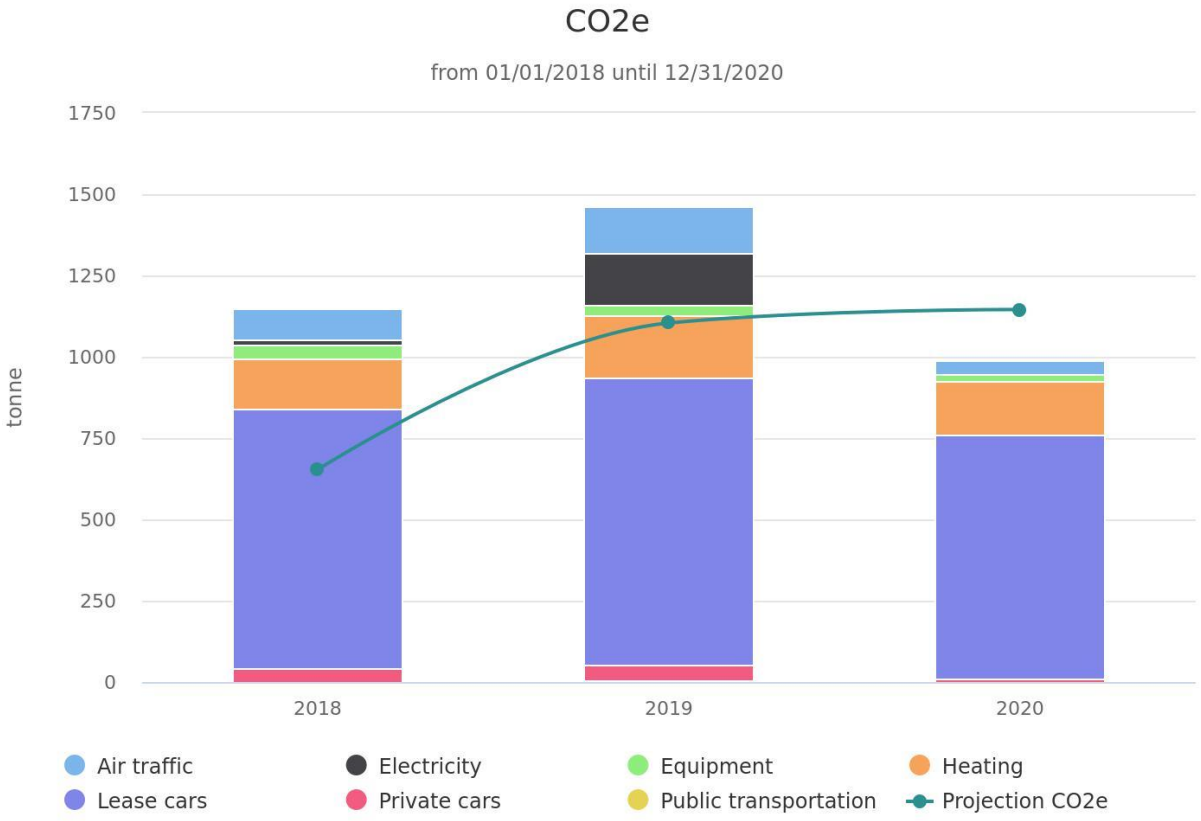

Figure 10 - Trend CO_2-emission per function

9 Reduction targets and progress

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

9.1 Reduction targets and progress - Scope 1, Scope 2 and Business travel in Scope 3

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 2020 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 both Scope 1, Scope 2 and Business travel in Scope 3.
Based on the calculated emission in 2019, the absolute target for 2020 is a maximum emission of 1,465 tonnes of CO_2.

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. The KPIs are included in Table 8.

Parameter/ KPI	2020	2019	Target 2020
CO_2e Scope 1/ FTE (tonne)	1.5	2.2	0%
CO_2e Scope 2/ FTE (tonne)	0.1	0.4	0%
CO_2e Scope 3/ FTE (tonne)	0.1	0.4	0%
CO_2e Scope 1+2/ FTE (tonne)	1.7	3.2	0%

Table 8 - Objectives 2020

With effect from reporting year 2021, the objective will be split into three parts: Scope 1, Scope 2 and Scope 3 “business travel”, this based on the changes in Handbook 3.1, in which business travel has been moved from the current Scope 2 to Scope 3.

9.1.1 Progress CO_2 emission reduction

The emission intensity per FTE reduced with 46% from 3.2 tonnes CO_2e/ FTE in 2019 to 1.7 tonnes CO_2e/ FTE in 2020. This means the objective has been met. The objective for the emission per Scope has also been met with a reduction of 17% for Scope 1, 70% for Scope 2 and 72% for Scope 3 emissions. The results are shown in Table 2.

An important factor that contributed to the positive results towards the reductions targets for 2020 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.

In the half year report a carbon dioxide emissions of about 1,250 tonnes CO_2 was expected. The actual value is even lower.

CO_2 emission (tonne)	2019		2020		Realised 2020-S1 <-> 2019-S1
Scope 1	1.049	(72%)	871	(88%)	-17%
Scope 2	214	(15%)	63	(6%)	-70%
Scope 3	202	(14%)	57	(6%)	-72%
Total	**1.465**		**991**		**-32%**
Emission CO_2/ FTE Scope 1	2.2		1.5		-31%
Emission CO_2/FTE Scope 2	0.4		0.1		-75%
Emission CO_2/ FTE Scope 3	0.4		0.1		-76%
Emission CO_2/FTE Scope 1,2,3	**3.2**		**1.7**		-46%

Table 9 - Realisation 2020

9.1.2 Progress share electric vehicles

If the first semester of 2018 is compared with the second semester of 2020, we see an increase in the percentage of electric / hybrid vehicles from 19% in Q1-2018 to 42% in Q2-2020. So this is in line with Alfen's general ambition.

9.2 Reduction targets and progress – other Scope 3 emissions

The CO_2 reduction target also extends to other indirect emissions in Scope 3. These targets are outlined in the Corporate value chain analysis for Alfen Charging Equipment [104] and the second version of the Corporate value chain analysis for Alfen transformer stations [105].

9.2.1 Charging Equipment

Below, a brief overview is given of the reduction targets set as a result of the Corporate value chain analysis of the charging station EVE.

1. *2020: 5% reduction of 2017's 98 kg of CO_2 component emissions*

   Progress update

   One of the housings of the charging station is currently made of fiber-reinforced polyester (sheet moulding compound - SMC). In accordance with the action plan, alternative materials for the housing, without fibers, will be selected, which will not only reduce the CO_2 emissions but also enable better recyclability. The reduction target is expected to be achieved.
   The new material is used for a new housing design for which a chain analysis will be drawn up. The release date of this design has been postponed.

2. *2022: 30% reduction of 2017's 529 kg CO_2 of emissions via energy consumption (standby)*

   Progress update

   The display of a charging station constitutes a relatively large percentage of its standby consumption. Therefore different methods are tested to dim or switch off the display to reduce energy consumption. This development is also part of the new design, but no final decision has yet been taken on the display design.
   It has been decided for an intermediate step in the development phases, in which the focus is on energy savings. This will be realised in a software update available for all products.

9.2.2 Transformer stations

In this section a brief overview of the reduction actions related to Alfen transformer stations is given.

1. *2020: investigate options for reducing energy losses.*

   Progress update

   Due to other priorities and customer influence for this investigation was postponed in the first semester.

2. *2020: monitor refurbishment of products (materials and types)*

   Progress update

   In the period 2019-2020 the number of refurbishments at Alfen site are relatively low, of which about 70% consists of an exchange of the MS installation. The amount of refurbishments in the field is approximately 450 transformer stations in total. Details on the refurbishments are not known.

   Based on an inventory we see a reasonable number of refurbishment at Alfen and in the field, but we have no actual performance indicator to monitor. Also the agreements on refurbishments have not yet been formalised with the customer and have also been delayed as a result of COVID-19 measures.

10 Conclusions and follow-up

Scope 1, Scope 2 and business travel in Scope 3
For 2020 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. For 2020 this corresponds to an emission of 3.2 tCO_2e/ FTE in total.

Based on the results presented in chapter 7, the conclusion is that the objective has been met with an amount of 1.7 tCO2e/ FTE in total. 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.

Based on the calculated emission in 2019, the aim for 2020 was a maximum emission of 1,465 tonnes of CO_2e. In 2020 the emission was 991 tonnes CO_2e.

The current objective is extended to the year 2022: the objective is to keep the CO_2-emission per FTE at least equal to the CO_2-emsission in 2019, despite the growth of the company. This objective has been set for Scope 1, Scope 2 and Business travel in Scope 3.

Based on the calculated emission in 2019, this specifically means a maximum yearly emission of 1.465 tons of CO_2

Scope 3
With regard to the Scope 3 emissions, can be concluded that actions to reduce the carbon footprint of materials related to the new charging station are postponed, because the release of an new design is postponed. However, possibilities are being sought for recycling the existing material.

Reduction of energy losses is also part of this new design, but it is decided for an intermediate step in the development phases, in which the focus is on energy savings. This will be realised in a software update available for all products.

Further has turned out, that ambitions to increase the number of transformer station refurbishments have not yet been formalised with the customer.
Based on an inventory over 2019 and the first semester of 2020, we see a reasonable number of refurbishment at Alfen and in the field, but we have no actual performance indicator in place to monitor. Also details on refurbishments are not known.

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.

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 2020 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. 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 the new 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 28-1-2020), which is recommended by Handbook 3.1 of the CO_2 Performance Ladder.

Until 2020, the reduction targets were set based on the rolling target base year, with a commitment period of one year. Since 2020, the year 2019 has been used as base year.

The figures and conversion factors for 2020 have been verified by an external party. This resulted in some adjustments. See 11.2.2.

11.2.1 Changes in calculation method in 2020

- Since 2020 private car kilometers are mainly derived from the new automated declaration system with mandatory fields for car type and fuel type. Previously individual declarations were analysed and processed.
- For Finland the three energy sources with own conversion factor have been added to the calculation.

- Home charging has been added to the calculation with effect from January 2020. IN previous years this data have not been included.

11.2.2 Recalculation of base year and historical data

No recalculation of base year 2019 has been performed, but the following corrections have been made for the first semester:

Lease cars:	the figure for additional declarations for lease-cars has been adjusted, resulting in a lower CO_2 emission for lease cars. The amount of diesel powered vehicles was adjusted for 63 to 64 vehicles.
EV-charging:	home charging has been added, charging at Alfen has been corrected due to insight in deviating values, resulting in a higher CO_2 emission for EV-charging.
Air travel:	the figure was recalculated, because it included flights that moved to the second semester due to COVID-19 measures.
Public transport:	the value was corrected because of a calculation error.

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 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 data	Invoices from diesel supplier	
	Fuel oil for heating FI	Primary data	Invoices from supplier	
	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 the inverter is defect.
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	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 2020

CO_2e (tonne)	2018	2019	2020
Electricity	0	0	0
Equipment	45	30	23
Heating	152	190	160
Lease cars	765	829	688
Total Scope 1	**962**	**1,049**	**871**

Emissions Scope 2 2020

CO_2e (tonne)	2018	2019	2020
Electricity	17	160	0
Heating	-	4	3
Lease cars	32	49	60
Total Scope 2	**48**	**214**	**63**

Emissions Scope 3 2020

CO_2e (tonne)	2018	2019	2020
Air traffic	94	147	44
Private cars	44	51	12
Public transportation	1	4	2
Total Scope 3	**138**	**202**	**57**

Appendix B Action plan reduction targets

No.	Action	Reduction	KPI	Resources	Responsible	Realisation date	Priority	Status	Explanation Status
Mobility									
2019.01	Introduction of Hydrotreated Vegetable Oil (HVO100) or Blue diesel (B100)	Diesel: 18% equipment & 10% vehicle fleet. From 2021 89% for equipment	Diesel meters SMTR		TD	2020	High	closed	HVO100 in the Netherlands is not accepted yet by car manufacturers. Therefore, it was considered to introduce HVO20 (EN590), but an own refueling installation is faced with legal restrictions. That is why we are waiting for more extensive sales at the pump and this action will be closed. For equipment HVO20 was implemented in Q4-2019. Per 2021 HVO100 will be used for equipment.
2019.02	Mobility policy	n.a.			HR	2020	Medium	ongoing	Integrated action 2019.02 to 2019.05.
2021.01	Development policy for working from home.	n.a.			HR	2021	Medium	new	
2019.06	Participation at Mobility Benchmark analysis	n.a.			QHSE	2019Q3	Low	closed	Report received, results are input for mobility policy.
2020.01	Research into green electricity for electric driving	50%	Public charging		BI	2020Q4	High	closed	It has turned out that purchasing green electricity for public charging is relatively too expensive.
Buildings, tools and equipment									
2018.01	Research on a possibility to extend the solar panel park.	n.a.			TD/MR	2021	Low	ongoing	Second subsidy request (Q1-2020) was granted. Business Case is depending on roof calculation. This was expected Q4-2020, but is postponed tot 2021 due to problems with roof capacity. Also expanded to roof new building.
2020.02	Switch to renewable electricity in Finland.	50%	Electricity meters FI SMRT	Appr. € 1.500	BI	2020Q2	High	closed	The switch is made with effect from January 2020. This is earlier than expected.
2020.07	NL Electricity reduction measures lighting and ventilation	± 8 *kWh*	Electricity meters NL SMRT	Appr. € 2.300	TD	2021Q4	Medium	ongoing	
2021.02	NL: Replace compressors HBW*28*	Ca. 4 kWh	Electricity meter HBW28 SMRT	Appr. € 11.600	TD	2021	High	new	
2020.08	NL Gas reduction measures isolation and heating	± 6 tCO_2e	Gas meters NL SMRT	Appr. € 1.500	TD	2021Q4	Medium	ongoing	50% measures performed

No.	Action	Reduction	KPI	Resources	Responsible	Realisation date	Priority	Status	Explanation Status
2020.09	Policy for electric hand tools	n.a.			QHSE	2021	Low	ongoing	
Products									
2019.11	Research on the reduction of the energy consumption of charging stations in standby mode	30% compared with 2017	LCA		R&D ACE	2019Q4	High	closed	Options for energy reduction have been investigated and tested. For existing charging stations continued under action 2021-03. For new developments continued under 2021.04
2021.03	Reduction of the energy consumption of charging stations by software update.				R&D ACE	2021	High	new	In the next software update a reduction of energy consumption compared with Eve 2017 is expected.
2021.04	Reduction of the energy consumption of charging stations by design change				R&D ACE	2021	High	new	For the new development different methods are tested to dim or switch off the display, in order to reduce energy. No final decision has yet been taken on the display design.
2019.12	Research on alternative components for charging stations	5% compared with 2017	LCA		R&D ACE	Part of new design	High	ongoing	In the new development better recyclability compared with Eve 2017 is expected. The realisation date is linked to new design. For the current housing action 2021.05 is added.
2021.05	Research on recycling of current housing charging station	unknown	LCA		R&D ACE	2021	High	New	
2019.13	Update of an existing value chain analysis.	n.a.			R&D	2020Q1	Medium	closed	The update of the chain analysis of the transformer stations was completed in April 2020.
2020.05	Monitor refurbishment of products (materials and types)	n.a.	Not defined		SALES	2020	Medium	ongoing	No kpi in use yet.
2020.06	Investigate possibilities to reduce energy losses for transformer stations	n.a.			R&D	2020	Medium	on hold	On hold due to other priorities in research, also highly dependable on customers.
2020.10	Performance of a corporate value chain analysis on Energy Storage Systems (ESS).	n.a.			R&D	2021Q1	Medium	ongoing	
Administration									
2020.03	Green certificates for new rental property.	n.a.			MAN	2020Q2	High	closed	Additional green certificates have been purchased in connection with the rental of the new building.
2020.04	Subdivision of energy consumption per building	n.a.			QHSE	2020Q2	Medium	closed	For 2020 more insight is gained into consumption in the Netherlands and the foreign sites.