AIM
ALFEN
INTEGRATED
MANAGEMENT
SYSTEM

Carbon Footprint Report 2020-S1

GHG emissions resulting from internal operations (unaudited)

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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 Netherlands, Belgium and Finland in the first six months of 2020. It has been prepared in accordance with the CO_2 Performance Ladder (version 3.0), 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 prescribed in § 7.3 of the ISO 14064-1.

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 cycle is described in the Alfen Integrated Management system (AIM).

The emitting activities covered by the report include all direct (Scope 1) and indirect (Scope 2) emissions, 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, air-conditioning equipment and vehicle fleet.
Indirect emissions (Scope 2) are a consequence of the activities of the company, but originate from sources that are not owned by the company and that are also not managed by the company. Within Alfen indirect emissions are associated with electricity consumption by company facilities and vehicles as well as emissions resulting from business travel [1].

Additionally, this report provides in chapter 7 a brief update on the progress of the reduction plan for both direct and indirect emissions, including emissions in the corporate supply chain (Scope 3).

Figure 1 shows the CO_2 Scope emissions related to the company.

An overview of methodology and data quality is provided in chapter 9.

[1] The CO_2 Performance Ladder, version 3.0 includes "Business travel" in Scope 2.

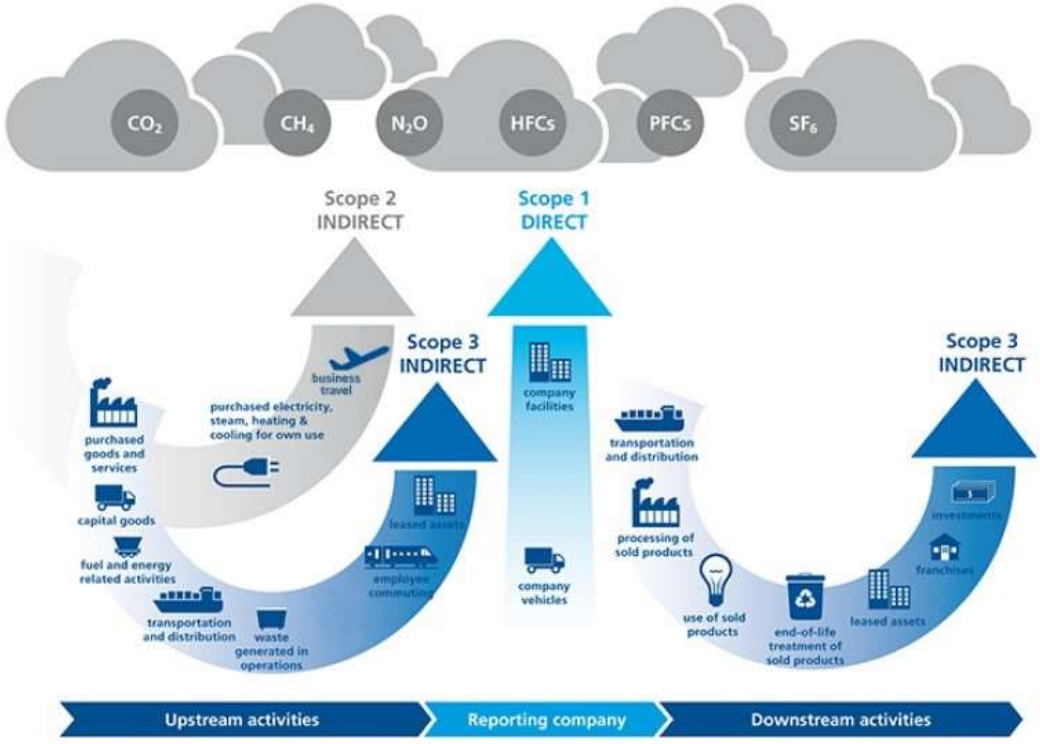

Figure 1 - Scopes Carbon Footprint-analysis

Executive summary - Environmental performance and key highlights

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

Alfen is certified according to the CO_2 Performance Ladder, level 4. This is an evident way of shaping the ambitions that Alfen has to realise its objectives in the field of sustainability.

In recent years, we have seen that the continuous growth and internationalisation of our business has an impact on our mobility and energy-related emissions. As a result of the expected continuation of growth, it was decided to set a target for 2020 to achieve at least equivalent CO_2 emissions per FTE compared to 2019, despite this growth.

During the first semester mobility was mainly impacted by the Covid-19 measures. We also expect this influence in the second semester. Further, the commissioning of the building at Hefbrugweg 85 from June 2020 will have consequences for energy consumption for 2020.

A number of measures have been taken for 2020. Efforts have been made toward CO_2 and energy reduction by switching to renewable energy sources in Finland, replacing lighting in the production hall in the new building with led and by further increasing the share of plug-in-hybrid and fully electric vehicles.

Thanks to these measures, but also under the influence of the Covid-19 measures, Alfen was able to reduce the environmental impact in terms of number of employees, and also to reduce the total impact compared to the same period in 2019. In concrete terms, this means that the current carbon emission is below the set target and that the objective is expected to be achieved.

Taking into account the break in the trend for mobility as a result of the Covid-19 measures, the commissioning of the new building at Hefbrugweg 85 and also the continuation of the expected growth in production and personnel, it has been decided to continue the current objective for the next two years, but with base year 2019.

To achieve the objectives, a number of new measures are defined 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
FTE	Full Time Equivalent
GHG	Green House Gas
PDCA	Plan-Do-Check-Act

Table 1 - Abbreviations

1.2 Definitions

Definition	Description
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 3.0 and 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 to develop, produce and sell products, systems and services related to the electricity grid, including smart grid solutions, charging equipment for electric vehicles and energy storage systems. Alfen's main geographic focus is the Netherlands, followed by Finland, Belgium, Germany, the United Kingdom and the rest of Europe. The production facilities are located in the Netherlands, Belgium and Finland. Over 550 employees are working within Alfen.

Based on the CO_2 emissions in the year 2019, Alfen is categorised as a medium-size company under the CO_2 Performance Ladder.[201]. The figures for the first semester of 2020 give no indication to change this classification.

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 and outlook
The Company grew from 497 FTEs at 31 December 2019 to 563 FTEs at 30 June 2020. Anticipating further growth in production quantities and internationalisation, a further increase in FTEs is expected for the second semester of 2020.

In the Netherlands, at the beginning of the year 2020, heating was installed in the new rented warehouse at Vlotbrugweg 22, which affects gas consumption. Further, at the end of May the building at Hefbrugweg 85 was taken into use. This had little influence on the first semester numbers, but it will affect the rest of the year.

In Finland during the first semester extra living space is used for foreign workers, which also influences gas consumption.

The CO_2 inventory also has been affected by the Covid-19 measures.

All influences are included in the relevant sections.

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

3.4 Reporting period

The reporting period covers January 01, 2020 until June 30, 2020, with base year 2019.

3.5 Verification

The CO_2 footprint for the first semester has not been verified by a recognised body.

4 Carbon footprint 2020-S1

The carbon footprint of Alfen includes both Scope 1 and Scope 2 emissions. Alfen's total emissions in the first semester (2020-S1) are equivalent to 534 tCO_2e. A breakdown by function is given in Figure 2.

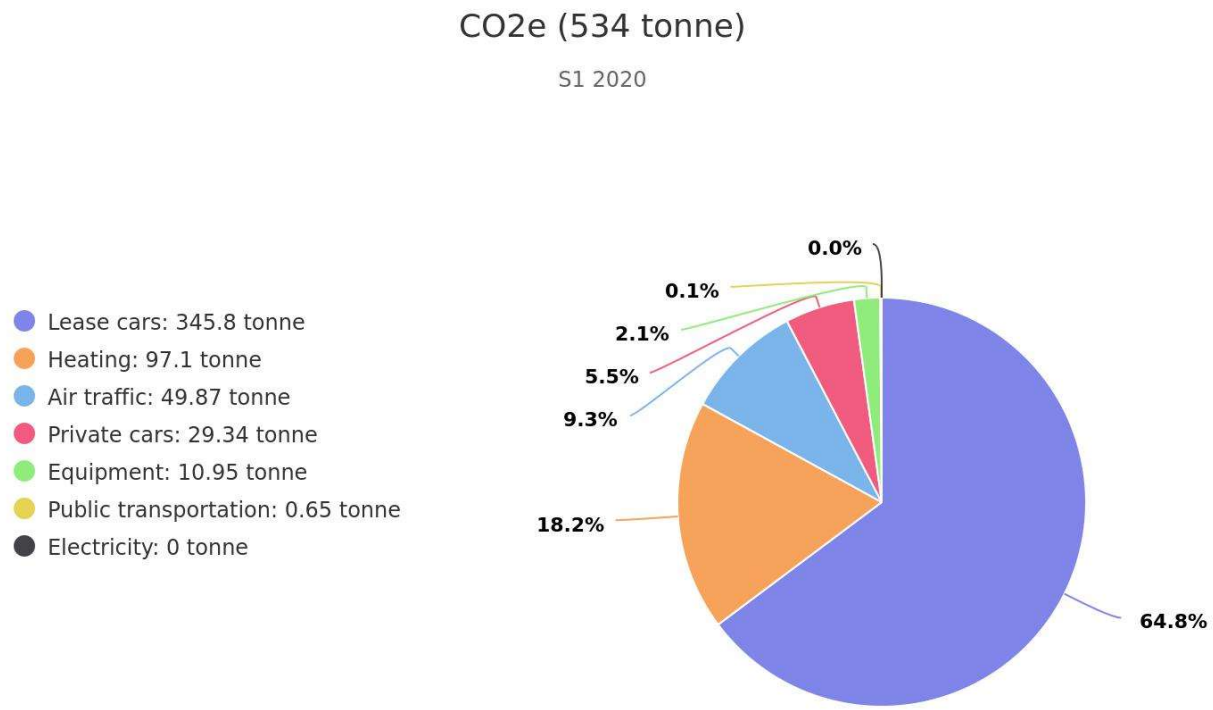

Figure 2 - Alfen Carbon Footprint 2020-1

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. However, there is no insight into the energy consumption of employees at home.

If we compare the carbon footprint of the first semester with the same period in 2019, we see a 28.5% decrease. In Figure 10 in section 6.3 the trend in CO_2-emissions related to function for the past three years is included.

5 Scope 1 - Direct CO_2 Emissions

In the first semester of 2020, direct emissions accounted for 438 tons of the CO_2 emitted by Alfen, a quantity of 82% of the total carbon emissions. This is a decrease of nearly 16% compared to the same period in the year 2019, but concerns a larger share.

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. Section 6.3 provides information on the trend of recent years.

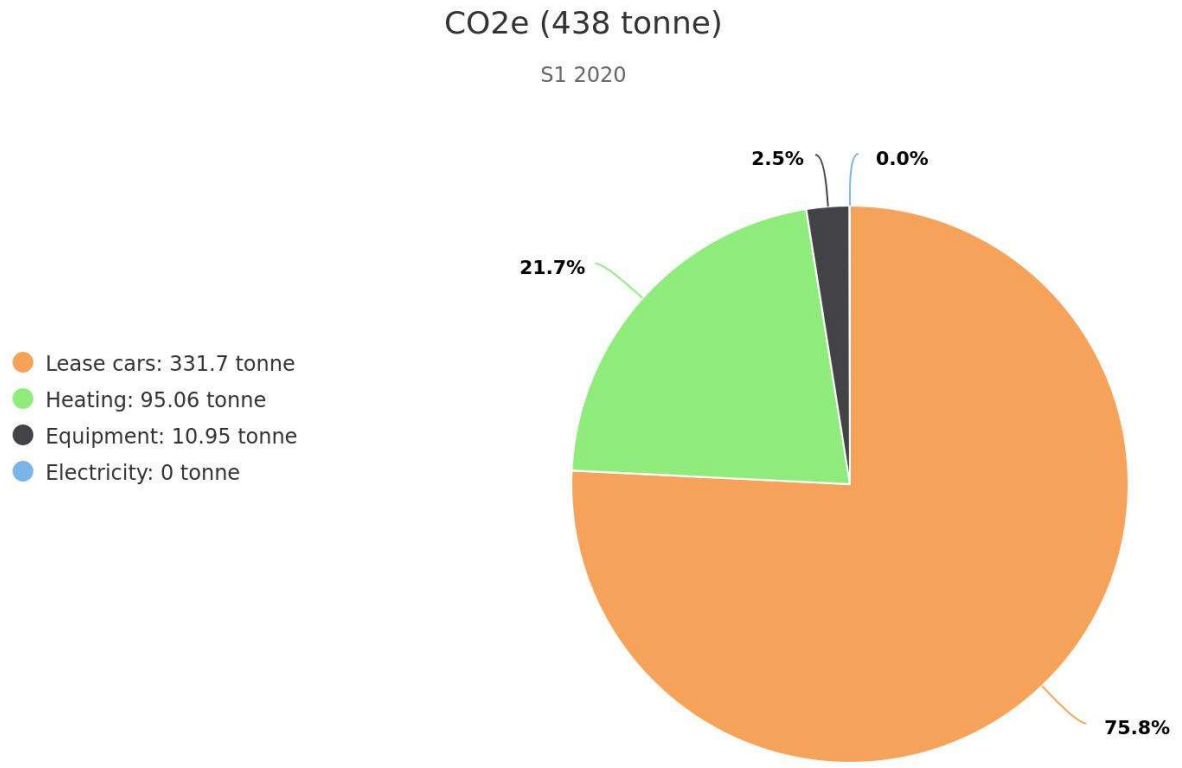

Figure 3 - Breakdown of Scope 1 CO_2-emissions

5.1 Equipment

Diesel fuel consumption by equipment, like stationary vehicles and forklifts, contributed 2.5% of the carbon footprint in Scope 1 and constitutes of 11 tonnes of total CO_2-emissions.

Carbon emissions related to equipment are slightly lower than in the same semester 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 the first semester heating for all buildings contributed 22% of the Carbon footprint in Scope 1 and constitutes of 95 tonnes of total CO_2 emissions. This is a 21% increase (20 tCO2e) compared to the same period in 2019.

Building-related emissions are influenced by higher employee numbers, the commissioning of the building at Hefbrugweg 85 as of end May 2020 and the installation of gas heating in the new warehouse at Vlotbrugweg 22. Also, in Finland extra apartments are used for foreign workers.

Remark: In Finland, no light fuel oil was refilled in the first six months 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 (76%) of all Alfen net emissions, contributing 331.7 tCO_2e in Scope 1. Electricity usage for lease cars (14,1 tCO_2e and 2.4%) is part of Scope 2.

5.3.1 Amount of lease cars

In the year 2018, a breakdown of company cars by fuel type was introduced. For the year 2020, we see further progress in the growth ratio in fully electrical vehicles from 12% in 2018-S1 to 28% in 2020-S1.

The Alfen vehicle fleet (including Belgium and Finland) consists of 122 vehicles by the end of the first semester. Figure 4 gives an overview of the vehicle fleet since 2018.

In 2020 the majority of the fleet is still diesel-powered vehicles (63 vehicles in total), however this amount is decreasing. The total number of fully electrical and petrol powered hybrid vehicles (PHEV) increased to 46 by the end of the first semester. This corresponds with 38% of the total vehicle fleet.

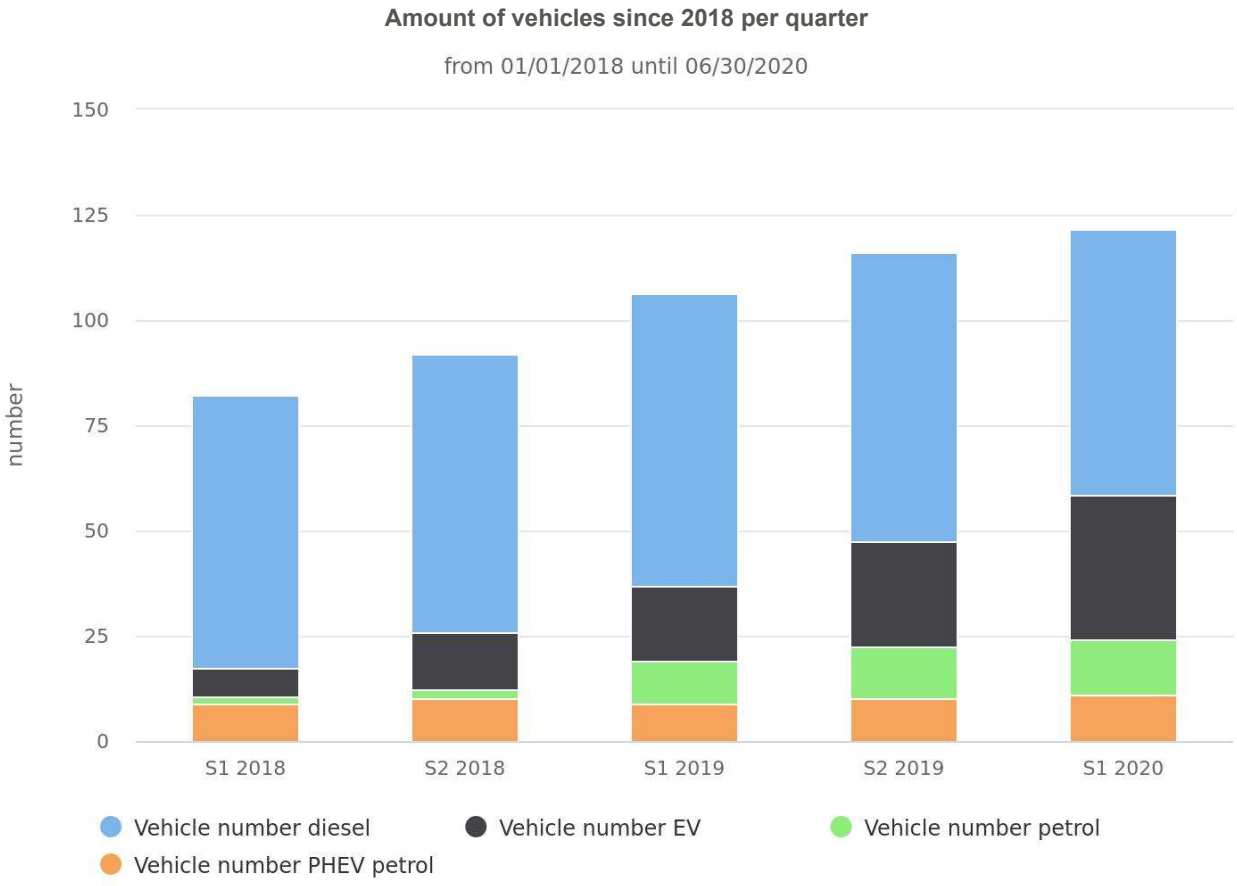

Figure 4 - Amount of vehicles

Amount of vehicles	S1 -2018	S2-2018	S1-2019	S2-2019	S1-2020
Vehicles diesel	65	66	69	69	63
Vehicles EV	7	14	18	25	35
Vehicles petrol	2	3	10	13	13
Vehicles PHEV petrol	9	10	9	10	11
Total	**83**	**93**	**106**	**117**	**122**

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 significant lower than in the first semester of 2019. This is visualised in Figure 5.

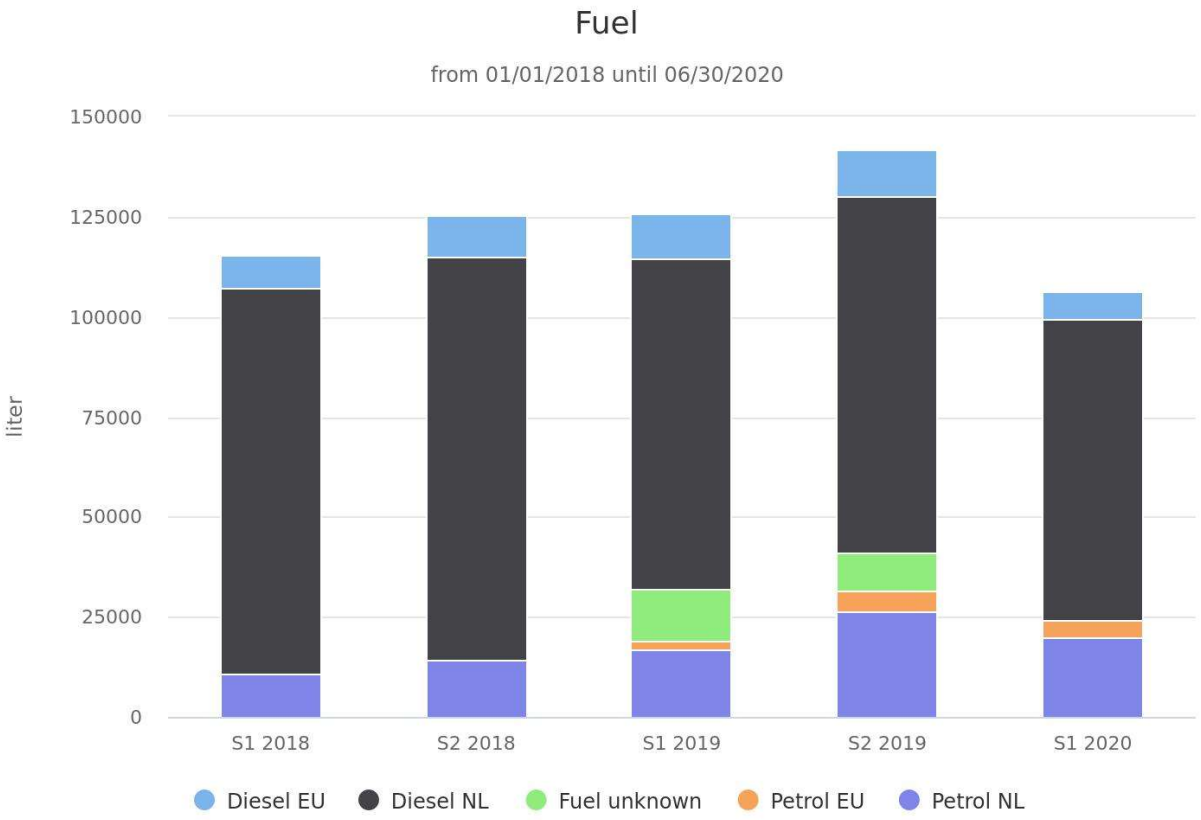

Figure 5 - Fuel-consumption lease cars

5.4 Refrigerants

In the year 2020 no leakage of air conditioning refrigerant has been detected, but not all installations have been serviced, yet.

6 Scope 2 - Indirect emissions

Alfen's indirect emissions in Scope 2 are a products of emissions resulting from electricity consumption and district heating (building related emissions) and business travel (mobility related emissions).

In the first semester of 2020 the emissions in Scope 2 contribute 96 tCO_2e, a quantity of 18% of the total carbon dioxide emissions. This is a decrease of nearly 58% compared to the same period in 2019.

Main reason for the decrease is the switch to renewable energy (wind energy) in Finland. In addition, the reduction in mobility due to the Covid-19 measure is of influence.

Figure 6 shows a breakdown of Scope 2 emissions in 2020-S1. The different topics are explained in te following sections. Section 6.3 gives the trend over the past years.

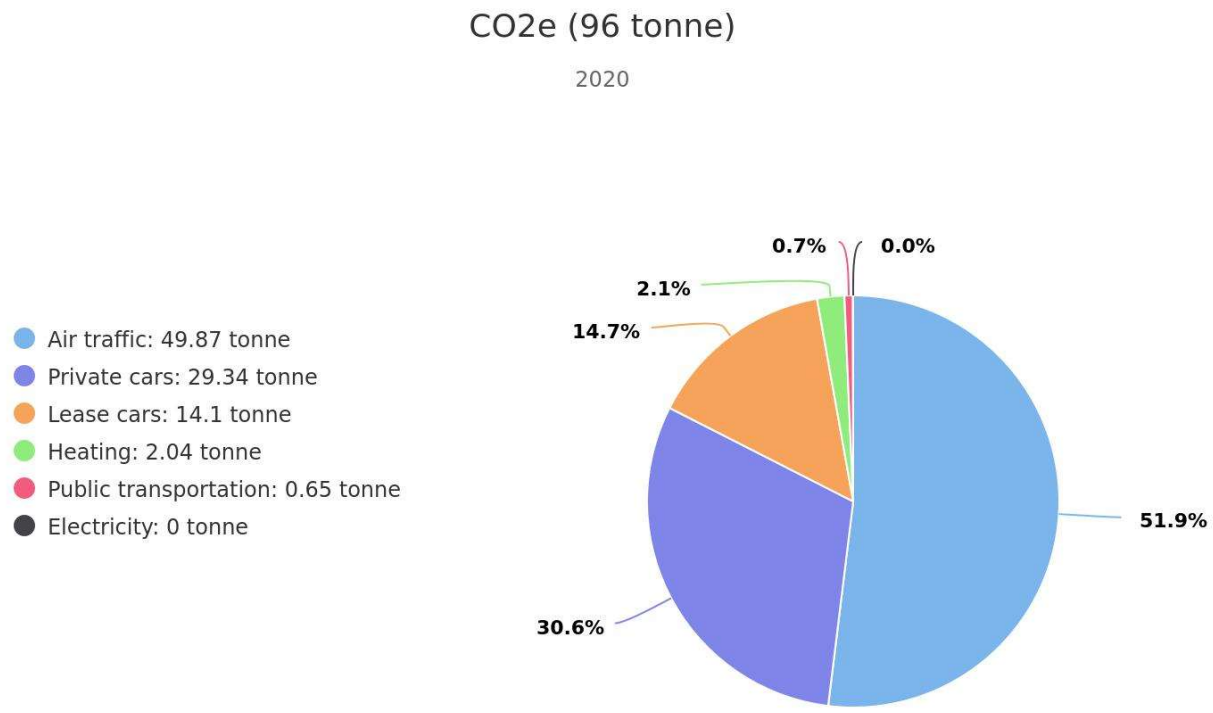

Figure 6 - Breakdown Scope 2 CO_2-emissions 2020-S1

6.1 Building related emissions

6.1.1 Electricity consumption

Electricity consumption in Scope 2 is responsible for zero percent of the total carbon emissions.

In previous years Alfen's reporting distinguished renewable sources of energy from non-renewable sources of energy. This is visualised in Figure 7.

In 2020, 100% of the Scope 2 electricity used originated from renewable sources. This is significantly more than in the same semester in 2019, where this contribution was 53.2%. This increase is due to the purchase of renewable energy in Finland.

Energy consumption in the Netherlands, Belgium and Finland is reported as emitting zero carbon dioxide as the purchased electricity is covered by green Guarantees of Origin.

Remark: The electricity consumption in Belgium has been estimated, because meter reading was not possible due to Covid19 measures.

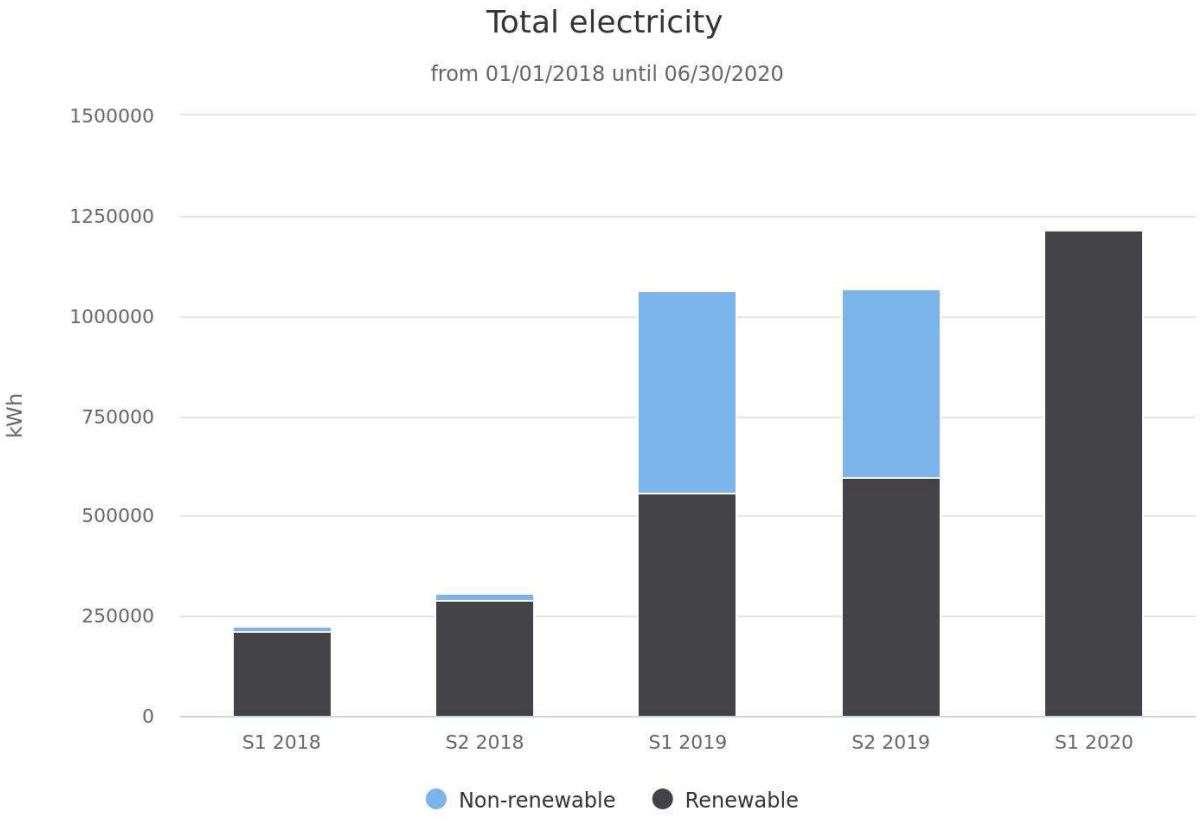

Figure 7 - Renewable and non-renewable energy Scope 2

Despite the positive developments in renewable energy sources, electricity consumption in Alfen's facilities increased some in the first half of 2020. This can mostly be attributed to the opening of the location at Hefbrugweg 85 by the end of May 2020 and the increase in testing activities for energy storage systems.

From the total electricity usage for buildings, an amount of 7% is used for EV-charging. This part is visualised in
Figure 8. About 5% of the measuring data was adjusted due to unclear values.
In 2019 an amount of 3% was used for E-charging.

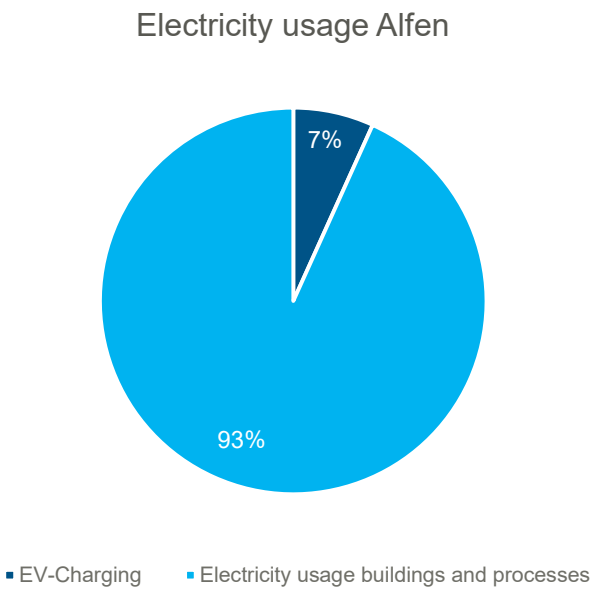

Figure 8 - Share EV-charging of total electricity usage.

6.1.2 District heating

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

6.2 Business travel (mobility)

Business travel is an unavoidable part of Alfen operations, and is responsible for about 80% of total emissions and 98% of Scope 2 indirect emissions.

Business travel is a product of air travel, traveling with electric lease cars, the use of private cars for business travel and public transport. A further explanation is given in the following sections.

6.2.1 Air travel

Air travel distances within Alfen and related CO_2-emissions are visualised in Figure 9.

Due to the Covid-19 measures air travel emissions decreased in the first semester from 81 tCO_2e in 2019-S1 to 50 tCO_2e in 2020-S1. For the second semester a re-increase is expected, but this is highly depending on Covid-19 measures.

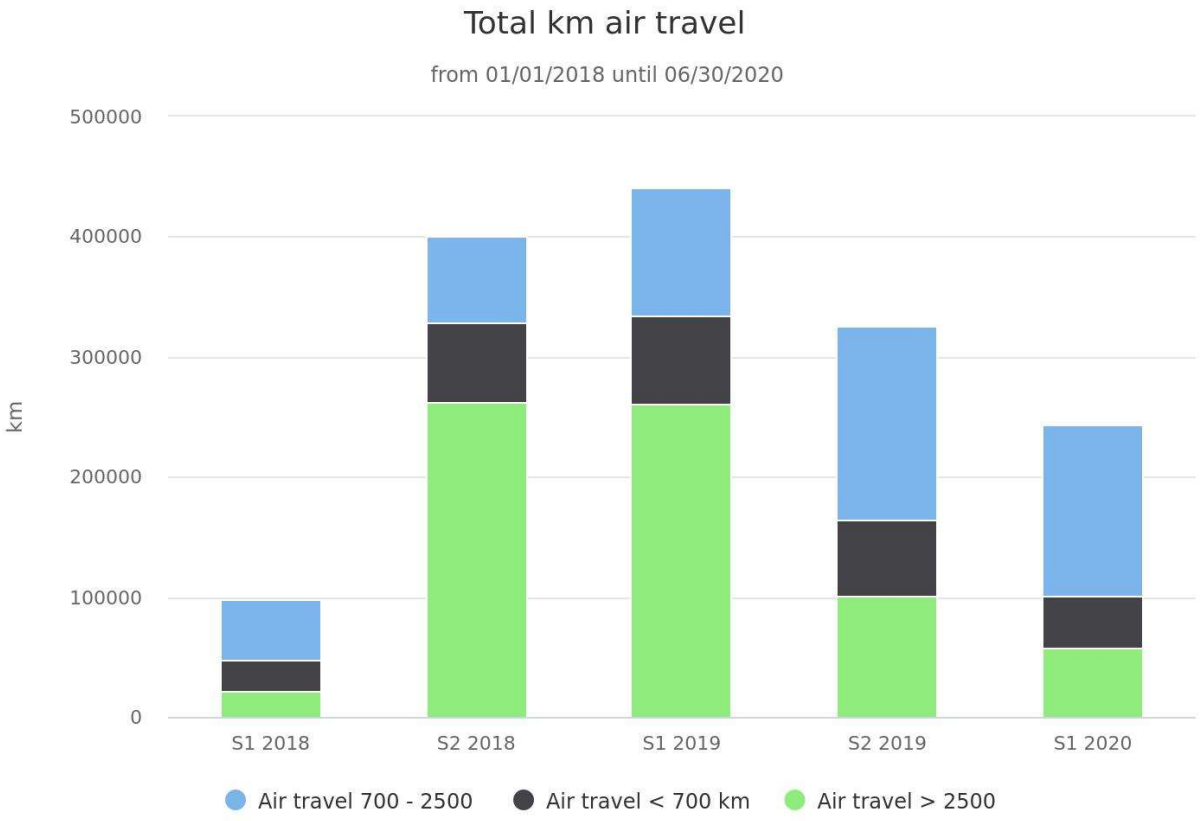

Figure 9 - Air travel distances

CO_2-emission by Air travel (tonne)	S1 -2018	S2-2018	S1-2019	S2-2019	S1-2020
Intercontinental, > 2500 km	3.3	38.5	38.3	14.8	8.5
Regional, 700 – 2500 km	10.0	14.4	21.4	32.3	28.5
Europe, < 700 km	7.7	19.8	21.7	18.6	12.9
Total	**21.0**	**72.7**	**81.4**	**65.8**	**49.9**

Table 6 - Air travel emissions

6.2.2 Lease cars (electric vehicles)

Scope 2 emissions from lease car relate to EV-charging of electric and plug-in hybrid electric vehicles at public and home charging points, where the source of the energy is unknown. These emissions account for 15% of the Scope 2 emissions. This amount is generated from invoices and expense declarations.

Part of the public charging points is located at Alfen, but the use of Alfen charging points by own lease cars is not known and is therefore not calculated separately as renewable energy.

6.2.3 Private cars for business travel

Emissions from personal cars for business travel account for 6% of overall emissions and 31% in Scope 2.

Each year, Alfen strives to expand the coverage and transparency of disclosure wherever possible. 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.

6.2.4 Public transportation

The 0.7 tCO_2 emissions resulting from travel via public transport are responsible for just 0.1% of the total emissions.

Also public transportation has been influenced by the Covid-19 measures. During the first semester, Alfen employees travelled 18,190 passenger kilometers, a 67% decrease (>36,000 km) compared to the same period last year.

6.3 Trend over the years by category

Figure 10 shows the trend since 2018 by category for Scope 1 and Scope 2 emissions.

The graph shows that lease cars make the largest contribution to Alfen's CO_2-emissions and that consumption per function is comparable to the first semester of the year 2018.

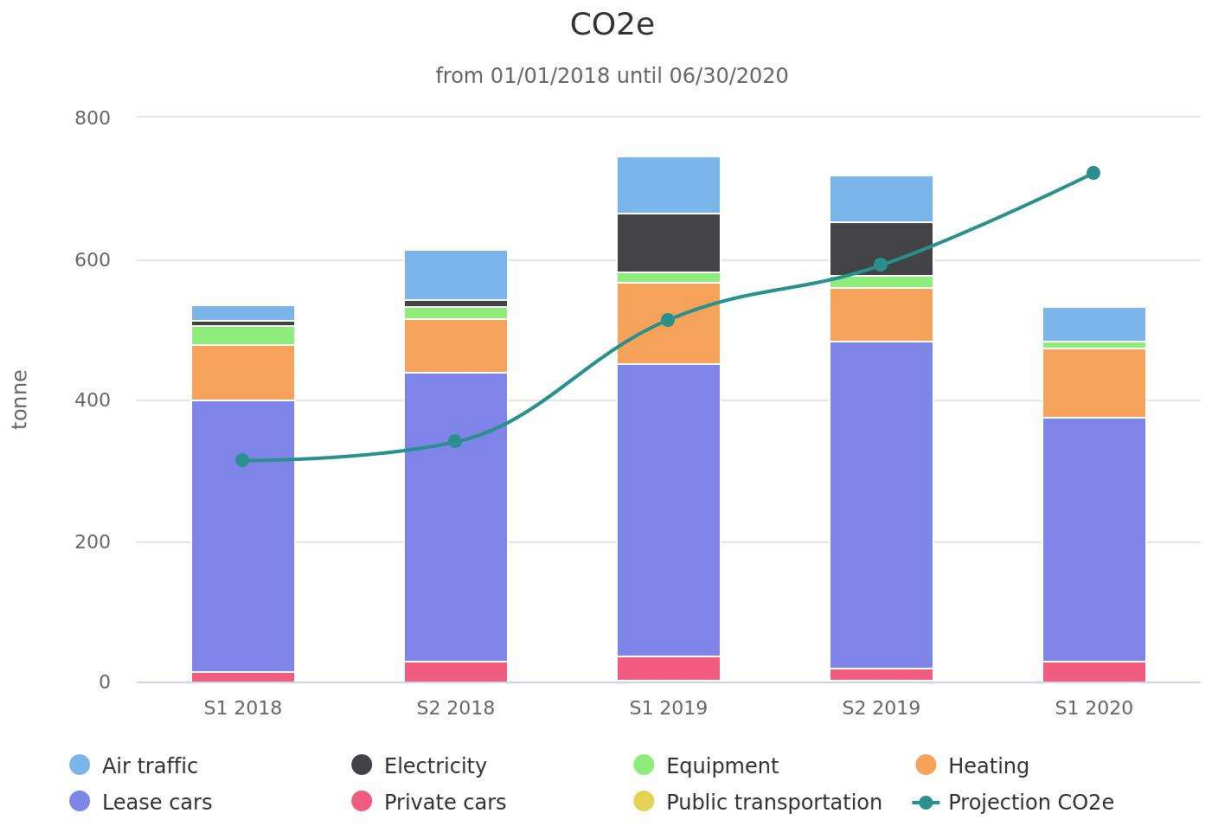

Figure 10 - Trend CO_2-emission per function

7 Reduction targets and progress

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

7.1 Reduction targets and progress - Scope 1 and 2

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. In this interim evaluation, the emission progress is included per Scope.
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 7.

Parameter/ KPI	2019-S1	2019-S2	Target 2020
CO_2e Scope 1/ FTE (tonne)	1.2	2.2	0%
CO_2e Scope 2/ FTE (tonne)	0.5	0.9	0%
CO_2e Scope 1+2/ FTE (tonne)	1.7	3.1	0%

Table 7 - 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.

7.1.1 Progress CO_2 emission reduction

The first semester the emission intensity per FTE reduced with 45% from 1.7 tonnes CO_2e/ FTE in 2019-S1 to 0.9 tonnes CO_2e/ FTE in 2020-S1. This means the emissions are below target. All the results are shown in Table 8.

An important factor that contributed to the positive results towards the reductions target 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 an impact.
Expectation is that by the end of the year the emission will be about 1,250 tonnes CO_2 and that the emission in ratio of carbon dioxide relative to FTE will be met.

CO_2 emission (tonne)	2019	2019-S1		2020-S1		Realised 2020-S1 <-> 2019-S1
Scope 1	1.049	519	(70%)	438	(82%)	-16%
Scope 2	416	227	(30%)	96	(18%)	-58%
Total	**1.465**	**746**		**577**		**-29%**
Emission CO_2 Scope 1/ FTE	2.2	1.2		0.8		-35%
Emission CO_2 Scope 2/ FTE	10.9	0.5		0.2		-67%
Emission CO_2 Scope 1+2/ FTE	3.1	1.7		0.9		-45%

Table 8 - Realisation 2020-S1

7.1.2 Progress share electric vehicles

If the first semester of 2018 is compared with the second semester of 2019, we see an increase in the percentage of electric / hybrid vehicles from 19% in Q1-2018 to 38% in Q2-2020. So this is in line with Alfen's general ambition.

7.2 Reduction targets and progress - Scope 3

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].

7.2.1 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.

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.

7.2.2 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 will be postponed.

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.

8 Conclusions and follow-up

Scope 1 and Scope 2
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 the first semester this corresponds to an emission of 1.7 tCO_2e/ FTE in total.

Based on the results presented in chapter 7, the conclusion is that the current progress is below the objective set, an amount of 0.9 tCO2e/ FTE in total. 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 is a maximum emission of 1,465 tonnes of CO_2e. Expectation is that by the end of the year the emission will amount about 1,250 tonnes CO_2e and that the emission in ratio of carbon dioxide relative to FTE will be met.

Taking into account the deviating year, the year 2019 will be set as base year for at least the next two years, so the principle of a rolling base year will be abandoned.

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

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 according to plan and are expected to be achieved. Reduction of energy losses is also part of this new design, but no final decision has yet been taken on the display design.

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.

9 Additional information

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

9.1 Methodology

To calculate the CO_2 emissions inventory, Alfen identified all relevant carbon dioxide emission sources, collected activity data from the relevant business units, and applied the emission factors in order to calculate emissions from each source.

By 2020, all Dutch buildings will be linked to a source. Monthly meter readings will also take place from Q2. This method makes it possible to monitor the consumption per building over time.

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.

In case of business travel by private car or public transport, the emissions are calculated from activity data such as fuel use or passenger miles.

For registration the software application Smart Trackers, a program for CO_2 measurements and assessments, is used. Smart Trackers uses emission factors from the publicly available website www.co2emissiefactoren.nl (version 28-1-2020), which is recommended by Handbook 3.0 of the CO_2 Performance Ladder.

9.2 Calculation method

Alfen's carbon footprint analysis for 2020-S1 follows the CO_2 Performance Ladder, and is consistent with the approach adopted in Handbook 3.0.

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.

The reduction targets are defined according to the rolling target base year, with a single year commitment period. With a rolling target base year, the base year rolls forward at regular time intervals, usually one year, in order that emissions are always compared against the previous year. From reporting year 2021 the base year will be set at 2019.

9.2.1 Changes in calculation method

- Since 2020-S1 private car kilometers are mainly derived from the new automated declaration system.
- For Finland the three energy sources with own conversion factor have been added to the calculation.
- The electricity and gas consumption for Belgium has been estimated, because meter reading was not possible due to Covid-19 measures.

9.2.2 Recalculation of base year and historical data

- No recalculation of the base year has been performed.
- One small adjustment was made to the calculation of gas based on degree days. This had no effect on the carbon footprint.

9.3 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 on Hefbrugweg 28 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 diesel supplier	
	Vehicle fleet	Primary data	Reports from lease company	
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) and declared costs for home charging.	In 2019 electricity consumption for home charging is based on the average costs of own lease cars: €0,23/ kWh.
	Business travel - private cars NL , BE	Primary data	Travel expenses 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 FI and public transport	Secondary data	Travel expenses	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 the use of private cars and 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	Travel expenses	Flight distances are calculated using http://nl.distance.to/.
	Business travel - rental cars	Secondary data	Travel expenses	For rental cars the average fuel consumption in the Netherlands is used: € 0.11 / km

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

Table 9 - Overview data quality and completeness

Appendices

Number	Title
Appendix A	Carbon Footprint Alfen by Scope
Appendix B	Action plan reduction targets

Appendix A Carbon Footprint Alfen by Scope

Emissions Scope 1 2020-S1

CO_2e (tonne)	2018-S1	2018-S2	2019-S1	2019-S2	2020-S1
Electricity	0	0	0	0	0
Equipment	28	17	14	16	11
Heating	77	75	114	75	95
Lease cars	367	398	391	438	332
Total Scope 1	**472**	**490**	**519**	**529**	**438**

Emissions Scope 2 2020-S2

CO_2e (tonne)	2018-S1	2018-S2	2019-S1	2019-S2	2020-S1
Air traffic	21	73	81	66	50
Electricity	7	10	83	77	0
Heating	0	0	2	2	2
Lease cars	18	13	24	26	14
Private cars	16	29	34	17	29
Public transportation	0	0	2	2	1
Total Scope 2	**62**	**125**	**227**	**189**	**96**

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.	Diesel meter SMTR		TD	2020	High	partly implemented, ongoing	HVO100 in the Netherlands is not accepted yet by car manufacturers. Therefore, we consider introduction of HVO20 (EN590). The research is postponed to 2020. HVO20 has been implemented for equipment in Q4-2019.
2019.02	Mobility policy	n.a.			HR	2019Q4	Medium	on hold	Actions are combined with the end date 2020. (General goals is the electrification of the fleet (former no. 2015.01)
2019.03	Renting of electric cars (research flex cars or standard available electric cars).	10%	Rental cars SMRT		QHSE, MR	2020Q4	Medium	ongoing	
2019.04	Research into commuting and flexible travel	n.a.			HR	2020Q4	Low	ongoing	
2019.05	Research into the possibility of introducing The New Driving.	± 3%			QHSE	2020Q4	Low	ongoing	
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%			BI	2020Q4	High	ongoing	Under investigation
Buildings, tools and equipment									
2018.01	Research on a possibility to extend the solar panel park	n.a.			TD/MR	2019Q1	Low	ongoing	The first subsidy request (Q4-2019) was declined. The second request (Q1-2020) was granted. Business Case is depending on roof calculation. Expected Q4-2020.
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 MW	Electricity meters NL SMRT	Appr. € 2.300	TD	2021Q4	Medium	new	
2020.08	NL Gas reduction measures isolation and heating	± 6 tCO_2e	Gas meters NL SMRT	Appr. € 1.500	TD	2021Q4	Medium	new	
2020.09	Policy for electric hand tools	n.a.			QHSE	2020		new	

No.	Action	Reduction	KPI	Resources	Responsible	Realisation date	Priority	Status	Explanation Status
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	ongoing	In the new development a reduction of energy consumption and better recyclability compared with Eve 2017 is expected.
2019.12	Research on alternative components for charging stations	5% compared with 2017	LCA		R&D ACE	2019Q3	High	ongoing	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.
2019.13	Performance of a new corporate value chain analysis or update an existing value chain analysis.	n.a.			R&D	2020Q1	Medium	closed	Second option was the update of an existing analysis. The update of the chain analysis of the transformer stations was completed in April 2020. A new analysis for Energy Storage Systems (ESS) is planned for Q1-2020. This action is added separately as 2020.09
2020.05	Monitor refurbishment of products (materials and types)	n.a.	Not defined		SALES	2020	Medium	new	Amount of refurbishments (2019/2020-S1): Low amount at Alfen site and appr. 450 transformer stations in the field. Details not known. No KPI. Also no agreements formalised with the customer, yet.
2020.06	Investigate possibilities to reduce energy losses for transformer stations	n.a.			R&D	2020	Medium	new and on hold	On hold due to other priorities in research, also highly dependable on customers.
2020.09	Performance of a corporate value chain analysis on Energy Storage Systems (ESS).	n.a.			R&D	2021Q1	Medium	new	
Administration									
2020.03	Green certificates for new rental property.	n.a.			MAN	2020Q2	High	new and closed	Additional green certificates have been purchased in connection with the lease of a new building.
2020.04	Subdivision of energy consumption per building	n.a.			QHSE	2020Q2	Medium	new and closed	For 2020 more insight is gained into consumption in the Netherlands. This is passed on to the foreign sites.