Climate Audit

Sto Scandinavia AB

2019

Building with conscience.

In collaboration with:

TRICORONA
CLIMATE PARTNER

CONTENT

Introduction

Tricorona Climate Partner AB (Tricorona) has, on behalf of Sto Scandinavia AB calculated the greenhouse gas emissions related to Sto Scandinavia's activities during 2019, stated in carbon dioxide equivalents (CO_2e). The calculation includes emissions from transportation, travel and facilities.

Methods

GHG Protocol

The GHG Protocol is the most widely used international accounting standard for carbon calculations, and it is used by governments, companies and organizations as a tool to understand, quantify and manage greenhouse gas emissions. A company's or an organization's operational boundaries are set by three scopes within the GHG protocol standard. Calculations are carried out in accordance with Tricorona's standard calculation method, which follows the GHG Protocol guidelines for reporting and covers the following principles:

- Relevance: Reporting should reflect the company's or organization's emissions in an adequate manner so that it can support decision making for users both internally and externally.
- Completeness: Reporting should cover all emissions within the specified system boundary. Any exceptions should be described and explained.
- Consistency: The method of calculation should be consistent so that comparisons can be made over time. Changes in the data, system boundaries, methods or similar, should be documented.
- Transparency: All activity data, methods, sources and assumptions should be documented.
- Accuracy: The calculated emissions should be as close as possible to the actual emissions.
- The organizational boundaries, which determine the sources of emissions included in this climate audit, are based on Sto Scandinavia's s organizational control. The greenhouse gas emissions from Sto Scanidnavia's 's operations, including direct and indirect emissions are divided into three scopes according to the GHG Protocol: scope 1, direct emissions; scope 2, indirect emissions from purchased energy; and scope 3, indirect emissions.

Scope

Emissions included in the report are categorized as follows:

Scope 1: Emissions from transportation from cars owned by Sto Scandinavia

Scope 2: Emissions from purchased district heating, cooling and electricity.

Scope 3: Indirect emissions caused by:

- Travel with airplanes, ferries, train, car and taxi
- Hotel stays
- Fuel and energy-related activities not included in scope 1 and 2
- Upstream and downstream logistics: Includes logistics that are paid for by Sto Scandinavia. Does not include logistics that are considered to be shipping with courier or express from Sto Scandinavia.

Assumptions

Data used in this report are provided by Sto Scandinavia. Templates used for calculations of material and emissions per SEK for travels are produced by Tricorona. In the section Business Travel, fuel has been assumed to be petrol if no other information is provided.

For air travel, Tricorona has updated its passenger load factor and RFI from 2,7 to 1,9 to match resent research findings. The change in factors lead to a decrease of emissions that might not have to do with decreased flying by Sto Scandinavia. To enable comparison with previous years, calculations with RFI 2,7 are included for key statistics.

See the reliability analysis at the end of the report for in dept information on confidence level of data.

Summary

Sto Scandinavia's operations during 2019 resulted in emissions of 1 922 tonnes CO_2e. Logistics caused most of the emissions (65%), followed by Travel (23%), Facilities (9%), Office material (2%) and Waste (1%), Figure 1,2 and Table 1,2 present the emissions divided by logistics, travel, facilities, office material and waste. Table 1 presents the emissions by division. In 2019, Sto Scandinavia had a turnover of 474 MSEK and 144 employees.

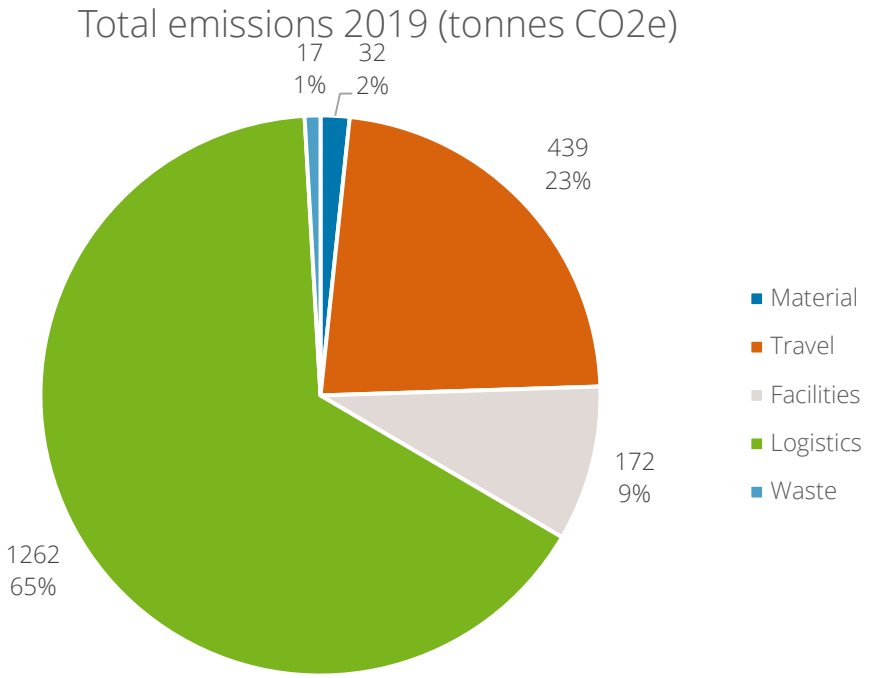

Figure 1. Emissions (tonnes CO_2e) per category 2019.

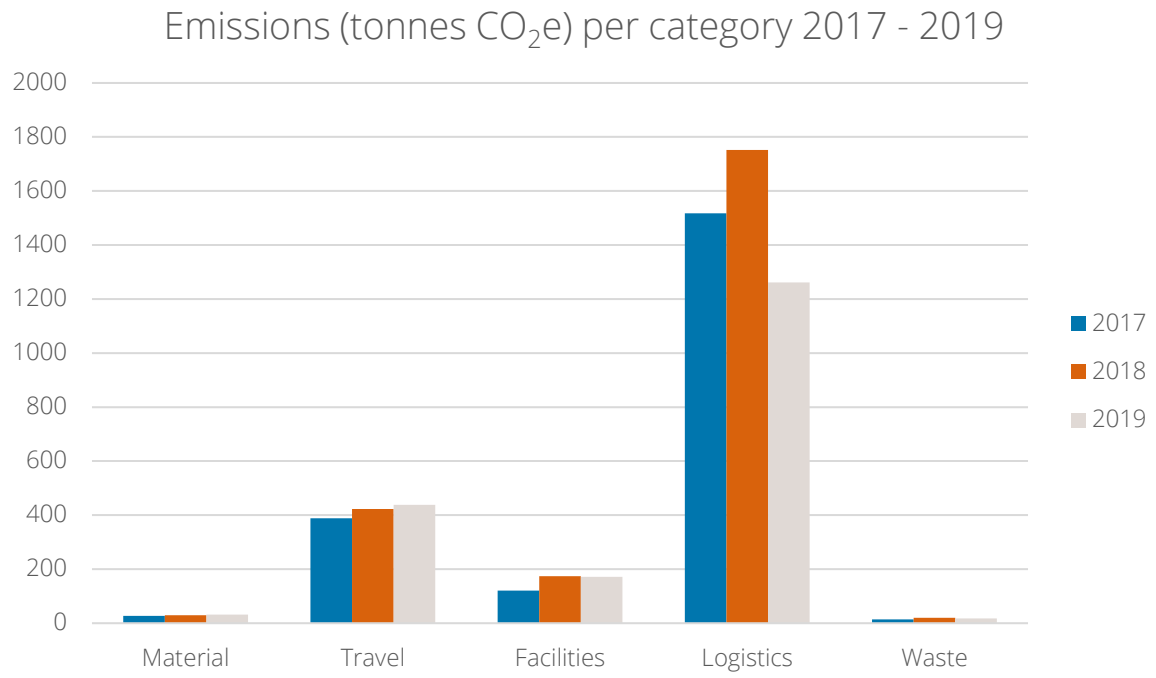

Figure 2. Emissions (tonnes CO_2e) per category 2017 - 2019.

Table 1. Emissions from operations (tonnes CO_2e) per category 2019.

Total emissions from operations (tonnes CO_2e)	Linköping	Sales Office and StoCenter	Total
Material	32	-	32
Travel	204	235	439
Facilities	142	30	172
Logistics	1 262	-	1 262
Waste	15	2	17
Total	**1 655**	**268**	**1 922**

Table 2. Emissions (tonnes CO_2e) per activity category 2017 -2019.

Total emissions from operations (tonnes CO_2e)	2017	2018	2019	Change 2018–2019
Material	27	29	32	9%
Travel	388	423	439	4%
Facilities	121	174	172	-1%
Logistics	1 517	1 752	1 262	-28%
Waste	14	20	17	-13%
Total	**2 064**	**2 398**	**1 922**	-20%

KPIs

Table 3. KPIs: emissions per turnover and emissions per employee (ton CO_2e) 2017, 2018 & 2019.

KPIs	2017	2018	2019	Unit
Emissions per employee	15,4	16,3	13,1	Tonnes CO_2e
Emissions per MSEK	4,7	5,5	4,4	Tonnes CO_2e

Despite an increased turnover and a relatively stable number of employees, Sto Scandinavia's emissions have decreased both in absolute and relative terms compared to both previous years and 2018. Behind this drop in total emissions are an important drop in emissions from logistics. This only significant increase running counter to this reduction is a 4 % increase in emissions from travel.

Emissions per scope

Figure 3 and Table 4 present Sto Scandinavia's emissions per scope. Emissions in scope 1 are from company leased cars from Volvo and Volkswagen and amount to 49 tonnes (3%) of total emissions. The emissions in scope 2, 114 tonnes, are caused by district heating and electricity and amount to 7% of the total emissions. Scope 3 emissions (1492 tonnes) are caused by logistics, travel, waste, office material, life-cycle emissions from energy production and well-to-tank emissions from energy and rented company cars and cause 90% of the total emissions by Sto Scandinavia.

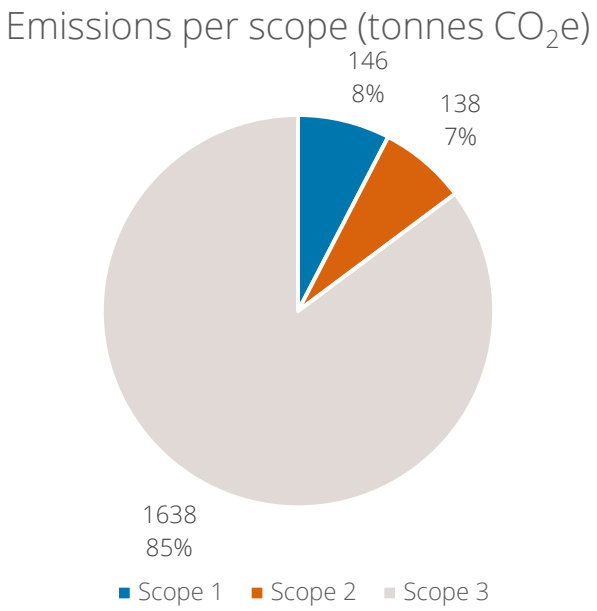

Figure 3. Emissions (tonnes CO_2e) per scope 2019.

Table 4. Emissions (tonnes CO_2e) per scope 2019.

Emissions per GHG-scope	Tonnes CO_2e
Scope 1	146
Scope 2	138
Scope 3	1 638
Summa	**1 922**

Facilities

Sto Scandinavia's emissions from facilities amounts to 172 tonnes CO_2e or 9% of the company's total emissions in 2019. Emissions from facilities are caused by electricity consumption and district heating, see Figure 4.

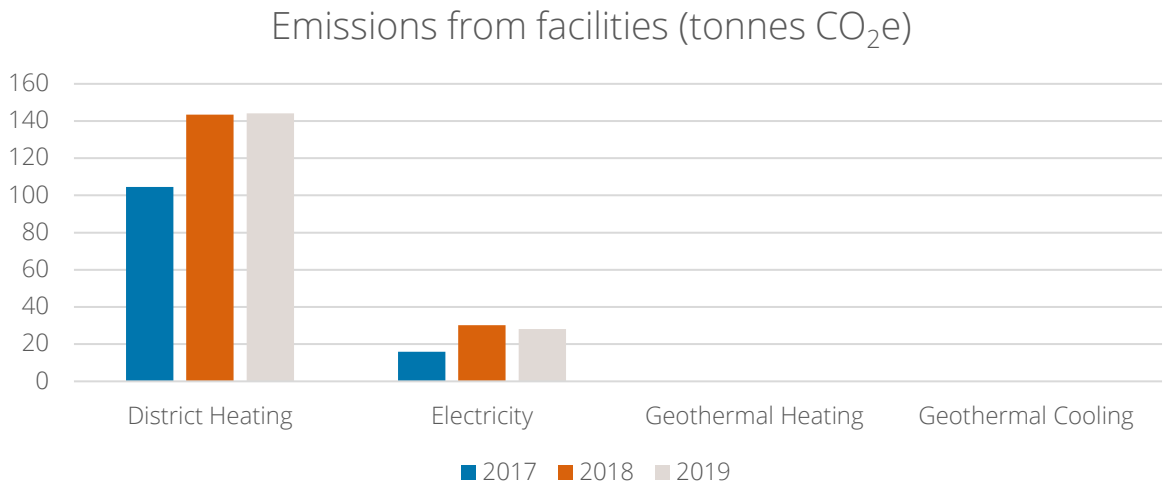

Figure 4. Emissions (tonnes CO_2e) per category 2017, 2018 & 2019.

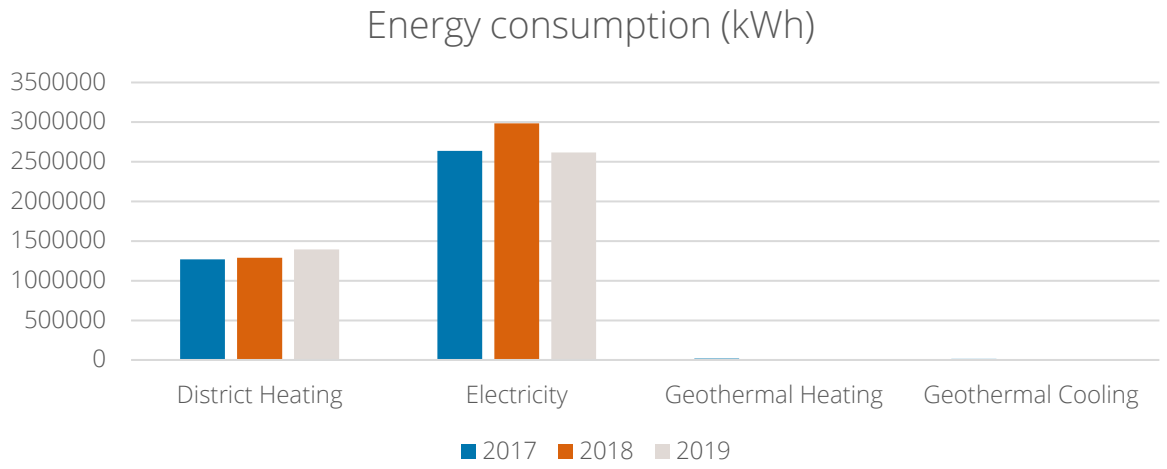

Figure 5. Energy consumption (kWh) facilities 2017, 2018 and 2019.

Table 5. Energy consumption (kWh) and emissions (tonnes CO_2e) 2017 - 2019.

Category	kWh 2017	Tonnes CO_2e 2017	kWh 2018	Tonnes CO_2e 2018	kWh 2019	Tonnes CO_2e 2019
Electricity	2 636 629	16	2 983 767	30	2 617 773	28
District Heating	1 252 038	105	1 289 315	143	1 393 759	144
Other*	49 576	0	12 332	0	0	0
Total	**3 938 243**	**121**	**4 285 414**	**174**	**4 011 532**	**172**

*District cooling, geothermal heating, geothermal cooling unspecified district heating/cooling.

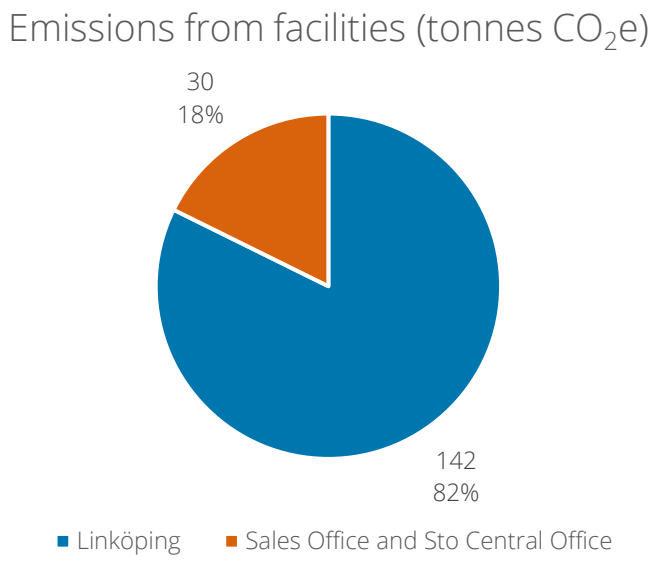

Figure 6. Energy consumption divided by Linköping and Sales Office and StoCenter.

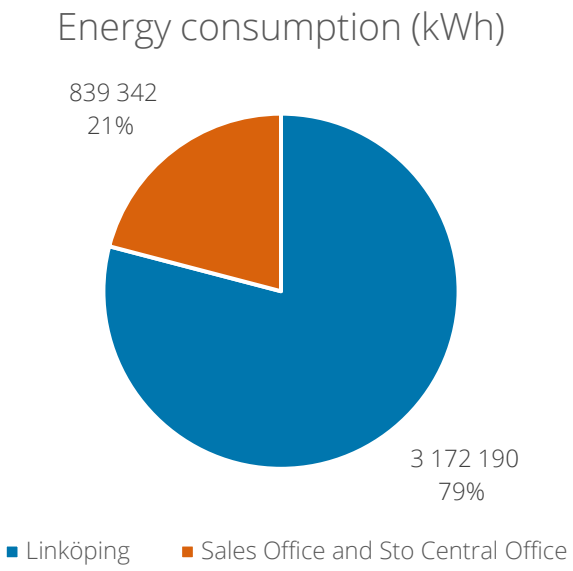

Figure 7. Energy consumption (kWh) divided by Linköping and Sales Office and StoCenter.

KPIs

Table 6. KPIs facilities

KPIs facilities	kWh 2017	Ton CO_2e 2017	kWh 2018	Ton CO_2e 2018	kWh 2019	Ton CO_2e 2019
Per employee	29 390	0,90	29 152	1,18	27 858	1,20
Per MSEK	9041	0,28	9 868	0,40	8 463	0,36

Energy Consumption Linköping

Emissions from energy consumption in Linköping reached 142 tonnes CO_2e in 2019. See Table 7 for emissions per facility.

Table 7. Emissions (tonnes CO_2e) from energy consumption Linköping (main office and production/storage) 2019.

Facility	Electricity	District Heating	Total
Linköping Ackord 13	22,8	70,5	93,3
Linköping Ackord 11 &12	1,3	40,5	41,8
Linköping Blå villan	0,2	6,4	6,6
Total	**24,3**	**117,4**	**141,7**

Energy Consumption Sales Office and StoCenter

Table 8 shows emissions from electricity and district heating at Sto sales and StoCenter amounting to 30 tonnes CO_2e in 2019. Uppsala has the largest amount of emissions, accounting for 28% of the total emissions.

Table 8. Emissions (tonnes CO_2e) from energy consumption at Sto Scandinavia's other facilities 2019.

Location	Electricity	District Heating	Total tonnes CO_2e
Falun	0,39	1,75	2,14
Helsingborg	0,46	5,76	6,22
Kista	0,46	4,23	4,69
Malmö	1,02	0,00	1,02
Mölndal	0,44	0,26	0,70
Umeå	0,25	0,17	0,42
Uppsala	0,15	8,32	8,47
Värnamo	0,13	0	0,13
Årsta	0,25	5,01	5,26
Örebro	0,21	1,20	1,41
Total	**3,77**	**26,70**	**30,47**

Sto Scandinavia mainly uses renewable energy for its facilities and district heating which results in relatively low emissions per unit of energy. To further lower the climate impact of facilities, Tricorona encourages Sto to focus on making facilities more energy efficient.

Material

Emissions from office material consumption amount to 32 tonnes CO_2e or just under 2% of total emissions. Material is calculated using a template developed by Tricorona representing the yearly usage of material and consumed goods at an office per employee. The template includes office materials, coffee, fruit, waste, electronics and toilet products and is calculated per full time employee. The number of employees has decreased since 2018 but due to an updated template by Tricorona, the emissions have increased. It is worth noting that the emissions would have decreased during 2019 using last year's template.

Table 9. Emissions (tonnes CO_2e) material 2017, 2018 and 2019.

Consumption	Tonnes CO_2e 2017	Tonnes CO_2e 2018	Tonnes CO_2e 2019
Material	27	29	32

Business Travel

Business travel accounts for 23% of total emissions. Emissions in this category have seen an increase from 423 tonnes CO_2e in 2018 to 439 tonnes CO_2e in 2019. Road travel accounts for most of the emissions (302 tonnes, 69%), and air travel is the second largest category, accounting for 121 tonnes or 28%. At 15 tonnes, hotel stays account for 3% of emissions from travel.

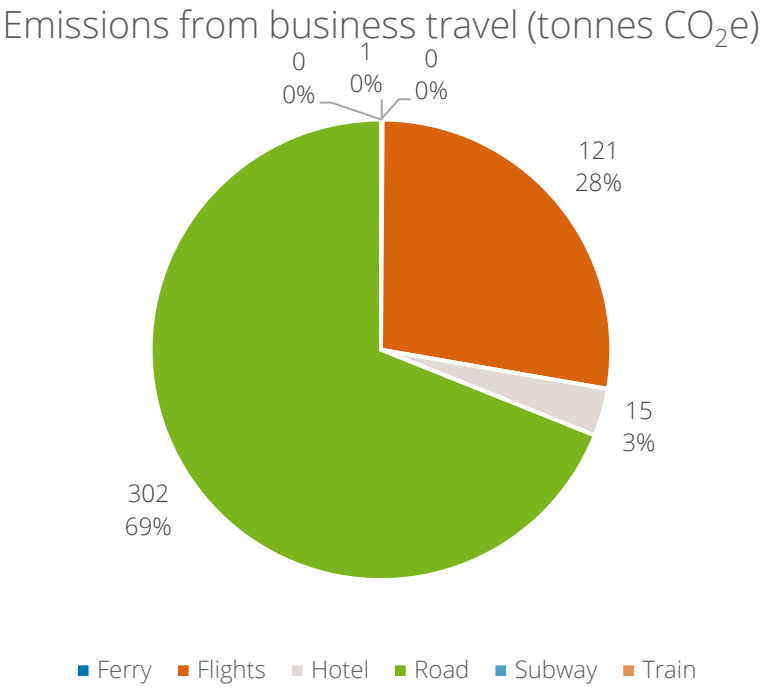

Figure 8. Emissions (tonnes CO_2e) from business travel.

Air Travel

Emissions from air travel are calculated separately based on each leg of the trip. This implies that a trip in the category 0-500 km may in fact be a part of a longer trip. This should be considered in the interpretation of the results.

In this report, emissions from air travel are calculated using a Radiative Forcing Index (RFI) of 1,9 and an updated passenger load factor recommended by Tricorona. Previous years an RFI of 2,7 have been

used which results in higher emissions than with RFI 1,9. To enable comparison between years, Table 10 will include emissions using an RFI 2,7 as well as RFI 1,9.

Sto Scandinavia's emissions from air travel amounted to 121 tonnes CO_2e during 2019. Air travel by Sales Office and StoCenter accounts for 57% of all emission from air travel and Linköping for 43%. Table 10 presents emissions, distance and amount of flights for both divisions.

Table 10. Total flights and emissions 2019, RFI 1,9 and RFI 2,7.

Category	Sales Office and StoCenter	Linköping	Total	Unit
Total emissions RFI 1,9	66	52	118	ton CO_2e
Emissions/flight RFI 1,9	136	159	295	kg CO_2e/flight
Emission/pkm RFI 1,9	0,230	0,219	0,449	kg CO_2e/pkm
Total emissions RFI 2,7	85	69	154	ton CO_2e
Emissions/flight RFI 2,7	177	213	390	kg CO_2e/flight
Emission/pkm RFI 2,7	0,300	0,293	0,593	kg CO_2e/pkm
No. Flights	482	325	807	flights
Total distance	284 463	235 517	519 980	pkm

Sales Office and StoCenter flights

Table 11 and 12 presents flight information for Sales Office and StoCenter. Table 11 presents flight information per distance category and Table 12 presents the 10 most frequently flown routes.

Table 11. Flights per distance, Sales Office and StoCenter.

Category	Number of flights	% of all flights	Total emissions (kg)	% of total emissions	Total distance (pkm)	% of total distance
Under 500 km	229	47,7%	22 851	34,9%	86 037	30,2%
500 to 1500 km	249	51,9%	42 070	64,2%	195 343	68,7%
1500 to 3000 km	2	0,4%	595	0,9%	3 083	1,1%
Over 3000 km	0	0%	0	0%	0	0%
Total	480	100%	65 516	100%	284 463	100%

Table 12 Top ten flight routes, Sales Office and StoCenter.

Route	Number of flights	% of all flights	Total emissions (kg)	% of total emissions	Total distance (pkm)	% of total distance
ARN-OSL	60	12,4%	6 211	9,5%	23 868	8,4%
CPH-OSL	42	8,7%	5 102	7,8%	21 172	7,4%
BMA-MMX	35	7,3%	4 257	6,5%	17 677	6,2%
ARN-ZRH	29	6,0%	8 368	12,8%	43 156	15,2%
BGO-OSL	22	4,6%	1 962	3,0%	6 882	2,4%
BMA-GOT	20	4,1%	2 008	3,1%	7 589	2,7%
ARN-OSD	19	3,9%	2 082	3,2%	8 237	2,9%
ARN-MMX	18	3,7%	2 274	3,5%	9 590	3,4%
CPH-ZRH	18	3,7%	3 536	5,4%	17 079	6,0%
AMS-LPI	15	3,1%	2 730	4,2%	12 964	4,6%
Other	204	42,3%	26 985	41,2%	116 248	40,9%
Total	**482**	**100%**	**65 516**	**100%**	**284 463**	**100%**

Linköping flights

Table 13 and 14 presents flight information for Linköping (main office and production). Table 13 presents flight information per distance category and Table 14 presents the ten most frequently flown routes.

Table 13. Flights per distance, Linköping.

Category	Number of flights	% of all flights	Total emissions (kg)	% of total emissions	Total distance (pkm)	% of total distance
Under 500 km	107	32,9%	10 703	20,7%	40 354	17,1%
500 km to 1500 km	209	64,3%	37 914	73,5%	179 456	76,2%
1500 km to 3000 km	9	2,8%	2 992	5,8%	15 707	6,7%
Over 3000 km	0	0,0%	0	0,0%	0	0,0%
Total	**325**	**100%**	**51 609**	**100%**	**235 517**	**100%**

Table 14. Top ten flight routes, Linköping.

Route	Number of flights	% of all flights	Total emissions (kg)	% of total emissions	Total distance (pkm)	% of total distance
AMS-LPI	38	11,7%	6 917	13,4%	32 843	13,9%
ARN-OSL	26	8,0%	2 691	5,2%	10 343	4,4%
AMS-OSL	22	6,8%	4 281	8,3%	20 632	8,8%
AMS-ZRH	21	6,5%	2 904	5,6%	12 672	5,4%
ARN-ZRH	17	5,2%	4 906	9,5%	25 298	10,7%
ARN-HEL	15	4,6%	1 553	3,0%	5 970	2,5%
BGO-OSL	14	4,3%	1 248	2,4%	4 380	1,9%
AMS-TXL	13	4,0%	1 741	3,4%	7 512	3,2%
ARN-UME	13	4,0%	1 517	2,9%	6 187	2,6%
HEL-OSL	12	3,7%	2 017	3,9%	9 358	4,0%
Other	134	41,2%	21 834	42,3%	100 322	42,6%
Total	**325**	**100%**	**51 609**	**100%**	**235 517**	**100%**

Road Travel

Road travel accounts for 69% of Sto Scandinavia's emissions from business travel. Table 15 presents the emissions from car, taxi and bus travel by division. Table 16 presents the change in emissions since the previous year. The amount of emissions from car travel has increased by 16% since 2018 while emissions from taxi travels have increased by 185%.

Table 15. Emissions road travel (tonnes CO_2e) by division.

Vehicle	Sales Office and StoCenter	Linköping	Total
Car	156	146	302
Taxi	0,04	0,02	0,06
Bus	0,57	0,17	0,74
Total	**157**	**146**	**302**

Table 16. Emissions road travel (tonnes CO_2e) 2017, 2018 and 2019.

Vehicle	2017	2018	2019	Change 2018–2019
Car	266	261	301	16%
Taxi	2	0,26	0,74	185%
Bus	-	-	0,06	100%
Total	**268**	**261**	**302**	**16%**

KPIs business travel

Table 17. KPIs business travel, Sto Scandinavia

KPIs business travel	2017	2018	2019	Unit
Emissions per employee	2,9	2,9	3	tonnes CO_2e
Number of flights per employee	4,1	4,9	5,6	flights

As shown in Table 11 and 12 most of Sto Scandinavia's flights are shorter than 1 500 km. Tricorona recommends Sto Scandinavia to replace the short flights with travel by train or digital meetings when possible. Implementing a policy for prioritizing train travel can lead to a great decrease of emissions. Changing to renewable fuels or electric cars can further reduce the emissions from road travel.

Logistics

Logistics (transport by truck) accounts for 66% of Sto Scandinavia's total emissions. Outbound logistics accounts for 41% of emissions from logistics while inbound logistics accounts for 59%. The total emissions have decreased since previous year resulting in a total of 1 262 tonnes CO_2e in 2019. Figure 8 presents the emissions from logistics by inbound and outbound and Table 18 presents tonkm and emissions for 2017, 2018 and 2019.

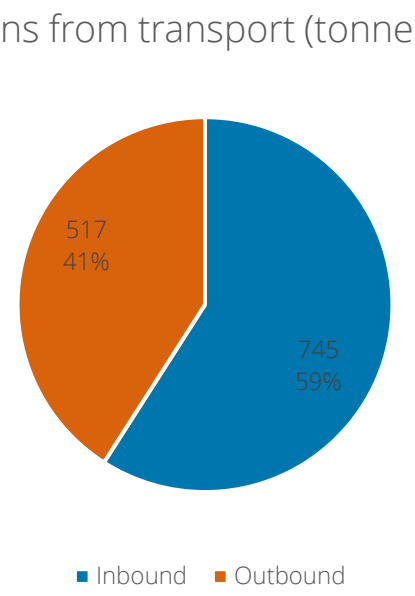

Figure 8. Emissions from transport (CO_2e) divided by inbound and outbound.

Table 18. Emissions (tonnes CO_2e) and tonkm per transport category.

Category	Tonnes CO_2e 2017	Tonkm 2017	Tonnes CO_2e 2018	Tonkm 2018	Tonnes CO_2e 2019	Tonkm 2019
Inbound logistics	645	9 528 017	690	7 695 203	745	6 746 790
Outbound logistics	872	8 165 361	1 062	9 625 155	517	6 700 918
Total	1 517	17 693 378	1 752	17 320 358	1262	13 447 707

KPIs logistics

KPIs for logistics are presented in Table 19.

Table 19. KPIs logistics (only includes logistics that are reported as tonne-km)

KPIs logistics	2017	2018	2019	Unit
Emissions per MSEK	3,5	4,03	2,7	tonnes CO_2e
Tonkm per MSEK	40 618	39 909	28 371	tonkm

Logistics is the dominant source of emissions for Sto Scandinavia. The emissions decreased both in absolute and relative terms in 2019 compared to the two previous years, which is positive and important. However, there are also important insecurities in the data regarding logistics as the basis for calculating emissions vary between different suppliers. There is also no clear reason why logistics would have decreased to this degree as the turnover has increased and the operations of Sto Scandinavia rely to an important extent on logistics. Based on this Tricorona's key recommendation is to ensure higher quality reporting from logistics suppliers, more specifically data on fuel use and measured tonne-kilometers for all transports undertaken. This will increase the reliability of the climate impact of logistics, which in turn is the most important part of Sto Scandinavia's carbon footprint.

Regardless of data quality, further efforts can be undertaken to reduce the carbon footprint of logistics. Thing are moving rather quickly on the logistics front and both cargo train and more biofuel use is likely to become more available in the years to come. These are excellent options to work with reductions of Sto Scandinavia's logistic carbon footprint.

Waste

Sto Scandinavia's waste resulted in emissions of 17 tonnes ton CO_2e, about 1% of Sto Scandinavia's total emissions in 2019. The majority (58%) of the emissions came from waste sent to landfill. Figure 9 presents the emissions from waste 2019.

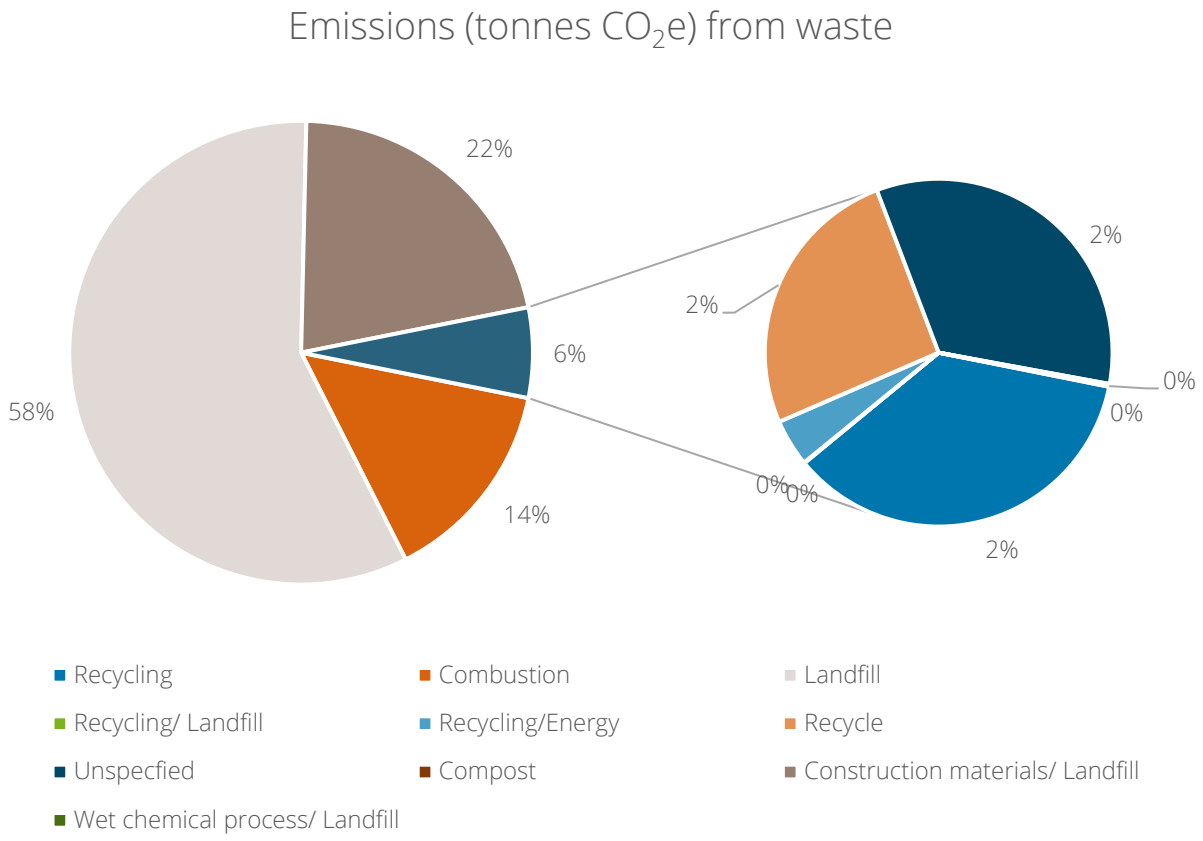

Figure 9. Emissions from waste products (tonnes CO_2e)

Table 20 shows that there has been a slight increase of waste since previous year, while emissions have decreased by 13%.

Table 20. Amount of waste (kg) and its emissions (tonnes CO_2e) for 2017 - 2019.

Category	Amount (kg) 2017	Amount (kg) 2018	Amount (kg) 2019	% change 2018-2019	Ton CO_2e 2017	Ton CO_2e 2018	Ton CO_2e 2019	% change 2018-2019
Landfill	471 145	622 449	463 078	-26%	9,32	13,57	10,1	-26%
Landfill/ construction materials	-		172 219	-	-	-	3,75	-
Wet chemical process/ Landfill	-	-	64	-	-	-	0,00	-
Recycling/ Landfill	-	-	33	-	-	-	0,00	-
Recycling/ Energy	-	-	4 713	-	-	-	0,10	-
Combustion	176 285	237 731	246 580	4%	3,84	5,18	2,52	-48%
Compost	361	70	140	100%	0,00	0,00	0,00	240%
Unspecified	30 640	31 700	17 300	-45%	0,67	0,69	0,00	-47%
Recycling	20 874	37 751	18 448	-51%	0,46	0,82	0,39	-52%
Total	**699 305**	**929 701**	**935 796**	**1%**	**14,29**	**20,27**	**17,46**	**-13%**

Reliability Analysis

Tricorona uses three categories (1, 2 and 3) for classification of the results based on the quality of the input data and the calculation values which the input data enables. The aim is to evaluate the input data and give feedback as to whether there is potential for improvement. The reliability classification is mainly based on the level of detail in the reported data (i.e. whether important details are missing) and specificity of reported data (i.e. to what extent input data is based on generalizations or estimations). In certain cases, classification may also be subject to Tricorona's judgment and the availability of specific emission and conversion factors used by Tricorona.

Data classified in category 1 are based on measured (rather than estimated) values. The input data is classified in category 2 when the input data is considered reliable, but some estimations, assumptions or averages have been used. Category 3 input data lacks multiple parameters and/or relies on multiple estimations, assumptions or averages. Figure 10 presents the confidence level of the input data used for this report.

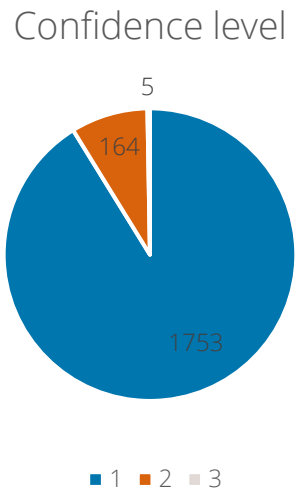

Figure 10. Confidence level of data 2019.

The quality of data is generally good. The most important improvements possible are to ensure better tonne-km data for logistics and to not use spending based data for traveling.