nordiccomputer.com

Climate Report

October 2023 – September 2024

Nordic Computer

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Nordic Computer

Introduction

This climate report, the second issued by Nordic Computer, is part of our ongoing commitment to environmental responsibility, transparency, and alignment with the EU Corporate Sustainability Reporting Directive. This report provides a comprehensive overview of our progress, challenges, and future ambitions on our climate strategy, as we strive to lower emissions and contribute to achieving a sustainable future.

In this report, we are pleased to highlight significant progress in reducing our direct emissions. Over the past year, we have successfully lowered our Scope 1 and 2 emissions, demonstrating the effectiveness of our energy efficiency initiatives and process optimizations across operations. These reductions reflect our ongoing commitment to decarbonizing our business operations and enhancing our environmental performance.

Additionally, we have taken proactive measures to limit the growth of our Scope 3 emissions, which are tied to our value chain. This includes working closely with suppliers to improve their sustainability practices, engaging in responsible procurement, and encouraging low-emission solutions wherever possible. Although Scope 3 emissions remain a challenging area for our industry, we are committed to collaborating across our ecosystem to address this complexity and further manage our overall climate impact.

This report details our initiatives, performance metrics, and next steps as we aim to meet—and exceed—the expectations set forth by the CSRD. We believe that climate action is not only a corporate responsibility but also a strategic opportunity to drive innovation and value for all stakeholders. Thank you for engaging with us on our journey towards a more sustainable future.

Sincerely,

Lars Juhl Frandsen
CEO & Partner

Nordic Computer

1 Executive summary

Following the standards for the EU Corporate Sustainability Reporting Directive this Climate Report describes the climate impact of Nordic Computer and its value chain. The business model for Nordic Computer is to purchase professional second-hand IT equipment for test and resale and to offer service contracts for data centers. This report covers the fiscal year from October 2023 to September 2024 and compares the results with results from fiscal years 2022-2023 and 2019-2020 (base year).

Since base year, Nordic Computer has reduced its scope 1 emissions from the consumption of fossil fuels by 49%. Likewise, scope 2 emissions from the consumption of electricity and heating have been reduced by 44%. This brings Nordic Computer very close to the targets of scope 1 and 2 reductions of 50% in 2030. Combined, scope 1 and 2 emissions constitute 90 tCO_2eq in reporting year.

Upstream scope 3 emissions have been kept almost constant since base year around 1320 tCO_2eq. Significant reductions have happened within logistics and packaging but these have been neutralized by other increasing scope 3 contributions. Downstream scope 3 emissions are caused by the electricity used by the devices sold to customers. These are by far the dominant emissions. An estimate show that they amount to 24000 tCO_2eq in reporting year. This is an increase of 12% since base year, which should be compared to a 30% increase in the number of sold devices. Continued decarbonization of electricity is expected to reduce these emissions significantly in the years to come making it possible to reach the target of a 50% reduction in 2030.

Nordic Computer

2 General disclosures (ESRS 2)

2.1 Scope

This Climate Report for Nordic Computer A/S covers the fiscal year October 2023 to September 2024. Like the previous year, the report has been prepared in accordance with the EU Corporate Sustainability Reporting Directive (CSRD) and the underlying European Sustainability Reporting Standards (ESRS).

Nordic Computer is not obliged to report according to CSRD. It is a voluntary choice, driven by company values, to support transparency, comparability and climate action. As a company based on a circular business model promoting reuse and life extension of professional IT equipment, it is an inherent part of the company DNA to work for lowering the impacts of the IT industry.

2.1.1. Geographical and organizational scope

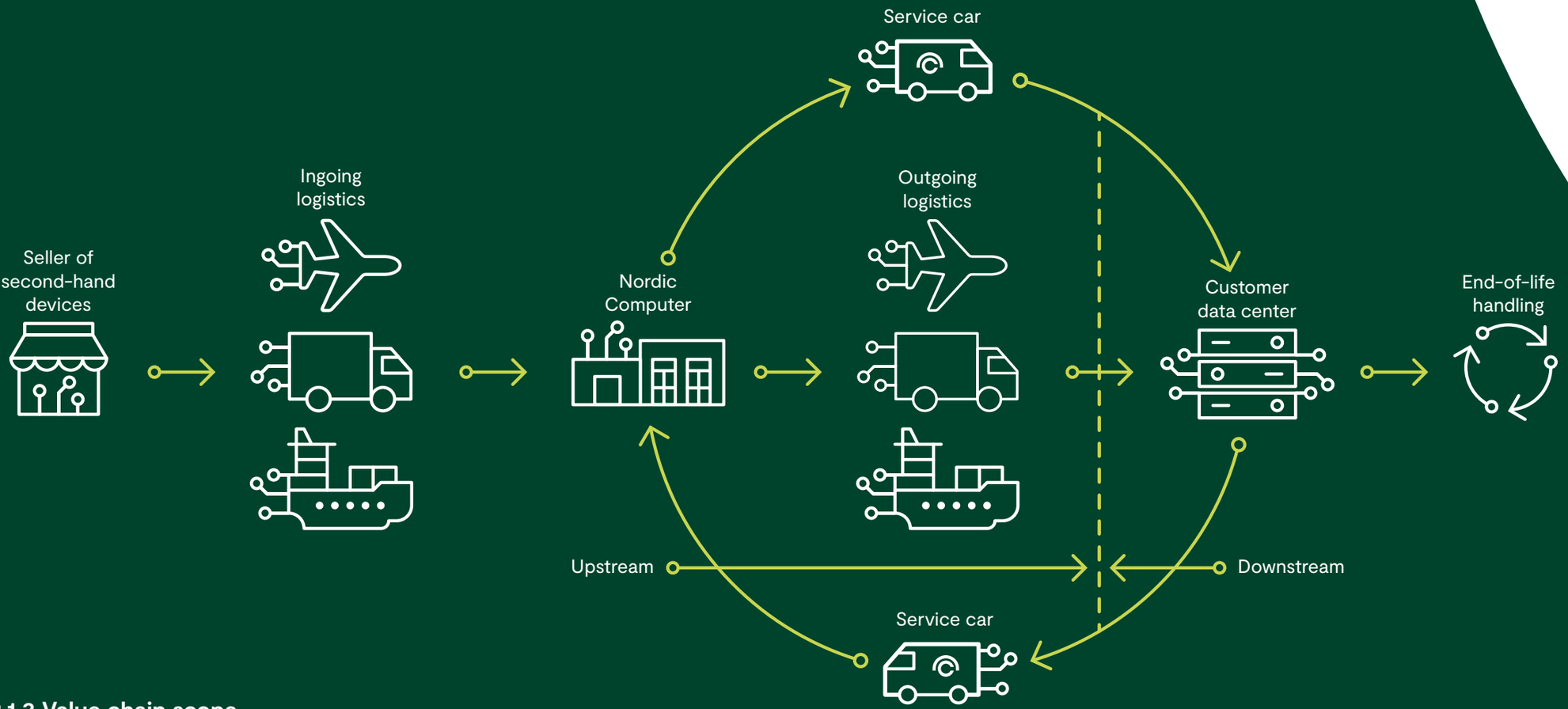
The report covers the parent company Nordic Computer A/S (VAT DK27524958) and all its direct activities. The Swedish subsidiary NC Datacenter Services AB and all its activities, as well as activities carried out by partners abroad, are outside scope.

2.1.2 Materiality and ESRS scope

Impact materiality is the topic of this report, while financial materiality is out of scope. The relevant topical ESRS standard for this Climate Report is E1 Climate Change. The cross-cutting standards 1 General requirements and 2 General disclosures are also within scope to the extent they are relevant for the ESRS E1 scope covered. Table 1 contains an overview of the ESRS E1 and ESRS 2 disclosure requirements covered in this report.

Table 1: ESRS disclosure requirements covered by this report

Disclosure requirements	Page(s)
ESRS E1 Climate change	
E1-1 – Transition plan for climate change mitigation	20-21
E1-2 – Policies related to climate change mitigation and adaptation	22
E1-3 – Actions and resources in relation to climate change policies	23-24
E1-4 – Targets related to climate change mitigation and adaptation	19-21
E1-5 – Energy consumption and mix	13-16
E1-6 – Gross scopes 1, 2, 3 and total GHG emissions	12
ESRS 2 General disclosures	
BP-1 – General basis for preparation of sustainability statements	5, 7-8
BP-2 – Disclosures in relation to specific circumstances	9-10
IRO-1 – Description of the process to identify and assess material impacts, risks and opportunities	11
IRO-2 – Disclosure Requirements in ESRS covered by the undertaking's sustainability statement	6, 9
SBM-3 – Material impacts, risks and opportunities and their interaction with strategy and business model	11



2.1.3 Value chain scope

The upstream and downstream value chain is within scope as illustrated.

Upstream, this includes the international purchase of second-hand IT equipment for test and resale, the transport of the devices to Nordic Computer's facilities in Denmark, the purchase of packaging and tools, office and IT equipment, software licenses and cloud services, insurances, employee education, travel and accommodation, purchases for the cantina, leasing of cars, rent, maintenance and cleaning of the facilities, and transport of IT devices to customers.

Employee commuting to and from work is not within scope.
The downstream value chain covers electricity consumption of the devices during the use phase at the customers' sites, and the final end-of-life handling of devices. E-waste and other waste categories directly from Nordic Computer are also part of the downstream value chain.

At customers' sites only the electricity consumption of the devices themselves is included. Energy consumed by cooling equipment or facilities is not included.

2.1.4 Omissions and exemptions

Nordic Computer has not made use of the option to omit information in this report due to IPR, know-how, results of innovation, impending developments, or matters in the course of negotiation.

As Nordic Computer is not obliged to disclose its revenue in its financial statement, revenue will not be disclosed in this report either. All revenue-based intensity measures are thus left outside scope. This is relevant for E1-5 *Energy consumption and mix* and E1-6 *Gross scopes 1, 2, 3 and total GHG emissions*.

The following ESRS E1 disclosure requirements are outside scope:

ESRS E1 disclosure requirements outside scope	Reason
E1-7 – GHG removals and GHG mitigation projects financed through carbon credits	Not material as Nordic Computer does not make use of carbon credits
E1-8 – Internal carbon pricing	Not material as Nordic Computer does not make use of carbon pricing schemes
E1-9 – Anticipated financial effects from material physical and transition risks and potential climate-related opportunities	Financial materiality is outside scope of this Climate Report

2.1.5 Base year and updates

The base year for Nordic Computer's climate reporting is the fiscal year 2019-2020. This was defined in last year's Climate Report that also presented climate-related data for the base year to establish the baseline against which progress can be measured. In this report, the baseline as well as the results of 2022-2023 have been recalculated, primarily due to an updated set of emission factors for previous years.

In alignment with ESRS 1, and to facilitate a proper timewise comparison based on a consistent dataset, the results from last year's report, including the baseline, are updated in this report. Further details can be found in appendix A.1 *Recalculation of baseline and past results*.

2.2 Assessments and estimations

2.2.1 Material information

This report follows the general scientific consensus that the primary measure of climate impact is the yearly amount of greenhouse gases (GHG) released into the atmosphere. Throughout the value chain of Nordic Computer GHG are emitted, mainly due to the use of energy generated from the burning of fossil fuels. Fossil fuels propel transport on land, at sea, and in the air, it is used for the electricity consumed by equipment sold to customers, and it is used for the electricity and heating supplied to Nordic Computer's facilities. Furthermore, all supplies to Nordic Computer, whether it be packaging material, food supplies for the cantina or insurances, as well as all waste handling also give rise to emissions.

In this report, energy is measured in megawatt-hours (MWh) and GHG emissions are measured in metric tons of CO_2 equivalents (tCO_2eq).

The emissions described above differ in orders of magnitude. Some contributions are way below the uncertainty level of others. To keep focus on what matters the most, a threshold of 10 tCO_2eq has been applied to determine contributions that are material. Contributions that are not material will not be reported individually but summed up in one single contribution to facilitate comparison.

2.2.2 Estimates and uncertainties

Emissions related to the production, transport, use, and end-of-life handling of the second-hand IT equipment that Nordic Computer purchases, tests, sells, and services for their customers, constitute a special challenge. Not only do almost all these emissions happen outside Nordic Computer's direct operations, which makes data collection difficult, the second-hand nature of the devices also needs to be taken properly into account.

Transport is the least challenging. The major logistic companies provide detailed impact reports, while emissions caused by minor transport providers have been estimated based on cost and appropriate emission factors.

Emissions caused by the electricity consumption of devices sold to customers is more of a challenge. First, customers do not measure electricity consumption for units provided by Nordic Computer separately. Second, the vast number of customers makes direct data collection impractical if not plain unrealistic. Third, some of these emissions occur in the future. Hence an estimate has been applied.

The basis for the estimate is a complete list of units sold in the reporting period. The list contains information about the unit type (server, solid-state disk, network switch, etc.) and the destination country for each unit. Three qualified assumptions are applied:

1. The electricity consumed in a year by all units of a given type, can be estimated as the number of units of the given type, times the average yearly electricity consumption for that unit type.
2. All units of a given type will be in operation for an assumed period. This assumption is completely analogous to the assumption applied by OEMs when they calculate the life-cycle emissions.
3. The emissions caused by all units sold to a specific country can be estimated as the electricity consumed by these units, times the carbon intensity for that country.

Further details can be found in appendix *A.2 Estimation of use-phase emissions*.

What is left is the production and end-of-life handling of devices. The fact that all devices are second-hand devices that have already been in operation for a first use phase, calls for a different approach than if the devices were brand new. According to academic studies [1], the impacts from production and end-of-life handling of second-hand items need to be discounted by a factor that is often called replacement rate RR.

The RR factor is a number between 0 and 1 that describes the extent to which the second-hand equipment is a replacement for brand-new equivalents. If a second-hand unit completely eliminates the production and end-of-life handling of a corresponding new unit RR is 1. Contrary, RR is 0 in a situation where a second-hand unit is purely additional and does not replace anything.

To determine the value of RR, it is often expressed as the product of two other factors $RR=P\times R$. The first factor is the probability P that a second-hand unit replaces a new unit at the time of acquisition, while the second factor is the ratio R of the periods for the first and second use-phases. The latter describes the extent to which a second-hand device lasts as long in the use phase as a brand-new device.

All units delivered by Nordic Computer are incorporated into operational environments in data centers where they are required due to operational needs. Data centers have no interest in buying, installing and maintaining second-hand devices if they are not needed. In other words, it is always the case that a second-hand unit replaces a new unit at time of acquisition, which means P equals 1.

Establishing the value of R is more challenging as concrete data are lacking. In general, it would be natural to expect that a second-hand item is worn and therefore likely to have a shorter use phase than a corresponding new item. However, that kind of logic does not apply here, as it ignores the fact that a huge amount of professional IT-equipment is replaced prematurely for non-technical reasons. For some types of units, the use-phase period for second-hand equipment can easily be twice as long as the use-phase for the brand-new equivalents.

Based on a number of more detailed arguments, see appendix A.4 *Use-phase period of second-hand devices,* there is no substantial reason to believe that Nordic Computer's customers expect to, and actually do, operate the devices for shorter periods than data centers buying new devices. Consequently, in this report R is assumed to have a value of 1. However, this assumption is a source of uncertainty and is subject to be validated in the future.

As both P and R equals 1, so does the replacement rate RR. This means that a second-hand unit delivered by Nordic Computer fully eliminates the emissions from production and end-of-life handling of a new corresponding unit. Emissions from production and end-of-life handling are thus not included in the calculated emissions in this report.

2.2.3 Process of identification of climate impact

Per definition, 1 tCO_2eq has the same climate impact irrespective of the nature of the GHG, the source of it, and location of the source. It does not matter if 1 tCO_2eq is emitted during a flight take-off in Australia or it is released during electricity production in Denmark. The GHG enters the same atmosphere and the climate impact is the same. Evaluation of the severity of impacts, the likelihood that they occur, and the derived priority of mitigation efforts, is thus reduced to a matter of the amount of GHG that is, or will be, released.

For Nordic Computer to be able to address this challenge it is key to keep track of the sources and relative amounts of GHG emitted in different parts of the value chain. This work was initiated in 2021 with the completion of Klimakompasset [2] for the fiscal year 2019-2020. Last year, Nordic Computer went a step further and released the first Climate Report for the fiscal year 2022-2023 in accordance with the new ESRS standards that were published just a few months before.

Awareness about climate impact in the value chain is thus not a new thing in Nordic Computer, and focus on reducing impacts is built into daily operations. All employees have been through an educational program on the triple bottom line; People, Profit and Planet. In this way, the challenge to come up with innovative ways to curb emissions is distributed widely in the organization. Larger decisions are always evaluated against the triple bottom line on a kaizen board amongst a group of relevant employees. This is also true for decisions made on management level.

The ownership of this process is well-established at management and board level. Management is the driver of the process in both communication and action, and they regularly meet to establish and evaluate the bigger picture in relation to Nordic Computer's climate impact and ways to reduce it. This approach has led to a number of changes over the last couple of years. More details can be found in *3.4 Transition plan*.

2.2.4 Impact overview

The big picture of the climate impact of Nordic Computer is the following: The dominant impacts, by far, belong to scope 3 and are thus happening in the value chain outside Nordic Computer's own operations. Specifically, emissions arising from the electricity consumed by sold units operating at customers' premises outweigh all other emissions by two orders of magnitudes.

Other major scope 3 emissions stem from the shipment of second-hand devices from sellers to Nordic Computer and further on to customers, purchased goods and services, business travelling, and the rent of Nordic Computer's premises.

3 Climate change (ESRS E1)

3.1 Energy

As a retailer of second-hand IT equipment, Nordic Computer belongs to NACE category G (Nomenclature of Economic Activities [5]), which is a high climate impact sector as defined by Commission Delegated Regulation (EU) 2022/1288. Accordingly, the consumption of fossil fuel sources is disaggregated in Table 2.

District heating and electricity used in Nordic Computer's facilities account for most of the energy consumed. These values have been provided directly by the utilities.

Leased company cars and cars rented for business travel are the only sources of emissions from crude oil and petroleum products. For previous years, the energy consumption has been based on fuel cost, a calculation of the yearly average price for a liter of fuel [3], and the energy density of the fuel [4].

Moving towards physical data, mileage has been registered this year. An average mileage per liter of fuel, obtained from the ratio of two emission factors based on kilometers and liters, respectively, together with the energy density of the fuel provide an estimate for the energy consumption.

Table 2: Energy consumed in Nordic Computer's own operations

Energy consumption and mix	2023/2024	2022/2023	Base year 2019/2020
(1) Fuel consumption from coal and coal products [MWh]	0	0	0
(2) Fuel consumption from crude oil and petroleum products [MWh]	137	200	263
(3) Fuel consumption from natural gas [MWh]	0	0	0
(4) Fuel consumption from other fossil sources [MWh]	0	0	0
(5) Consumption of purchased or acquired electricity, heat, steam, and cooling from fossil sources [MWh]	540	529	704
(6) Total fossil energy consumption [MWh] (sum of lines 1 to 5)	**677**	**729**	**967**
Share of fossil sources in total energy consumption [%]	**100**	**100**	**100**
(7) Consumption from nuclear sources [MWh]	**0**	**0**	**0**
Share of consumption from nuclear sources in total energy consumption [%]	0	0	0
(8) Fuel consumption for renewable sources, including biomass (also comprising industrial and municipal waste of biologic origin, biogas, renewable hydrogen, etc.) [MWh]	0	0	0
(9) Consumption of purchased or acquired electricity, heat, steam, and cooling from renewable sources [MWh]	0	0	0
(10) The consumption of self-generated non-fuel renewable energy [MWh]	0	0	0
(11) Total renewable energy consumption [MWh] (sum of lines 8 to 10)	**0**	**0**	**0**
Share of renewable sources in total energy consumption [%]	**0**	**0**	**0**
Total energy consumption [MWh] (sum of lines 6, and 11)	**677**	**729**	**967**

3.2 Emissions

3.2.1 Emission factors

With a few exceptions the emission factors used in the following are from Klimakompasset [2]. Most of these are taken directly from EXIOBASE or modified slightly to fit into a Danish context. For instance, the emission factors for diesel and petrol have been modified to account for the bio-fuel content in Denmark. Input for these modifications is often provided by the DEFRA database.

The exceptions are emission factors for electricity and heat for Nordic Computer's premises. In these cases, emission factors reported by the utilities are used. These represent the specific situation for the local district heating network and the western electricity zone in Denmark, called DK1.

Finally, emission factors for electricity in all countries worldwide have been obtained from Our World in Data [10]. These are used to estimate the emissions from electricity consumed by customers operating the units sold by Nordic Computer.

The emission factors for aviation include the radiative forcing index (RFI).

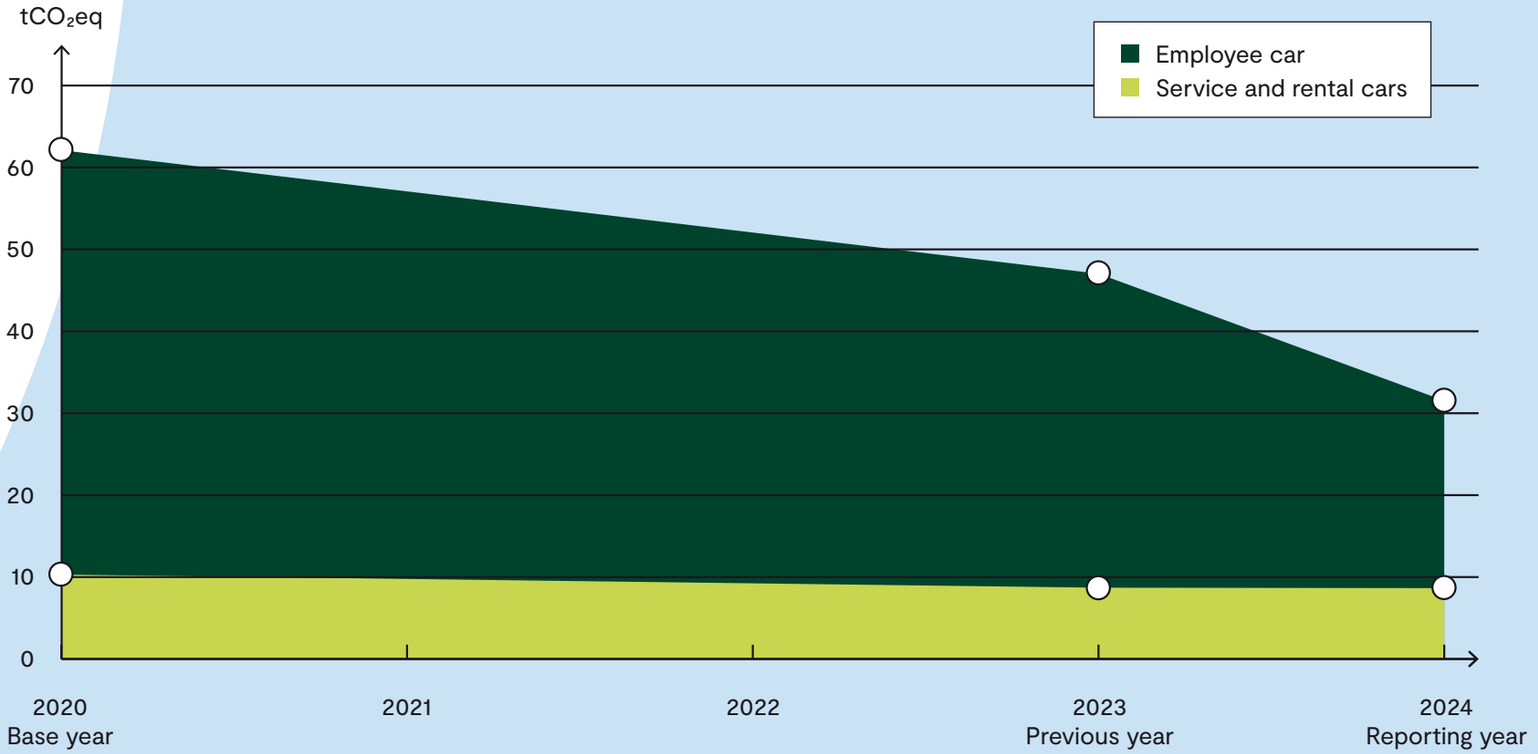
For the base fiscal year, emission factors for 2019 have been used, while the latest available emissions factors, for 2023 preferably – otherwise 2022, have been used for the year 2023–2024. In general, emission factors for the year marking the start of the fiscal year are used, as far as possible. This represents a change from last year's Climate Report, but it ensures a more consistent choice of emission factors. A more detailed description can be found in appendix *A.1 Recalculation of baseline and past results*. A list of all emission factors applied is available in *A.5 Emission factors*.

3.2.2 Scope 1

The only source of scope 1 emissions in Nordic Computer is the diesel and petrol used in company cars and cars rented for business travel. A company car is either a service car or a car provided to an employee as part of the contract.

If mileage has been registered, the emissions are calculated directly via the appropriate emission factors. Otherwise, emissions are based on an estimation of the amount of fuel consumed, analogous to the approach described in section 3.1 Energy.

Figure 1 shows the remarkable results that scope 1 emissions have been reduced from base year to reporting year by 49%, mainly due to a reduction of the emissions from employee cars.

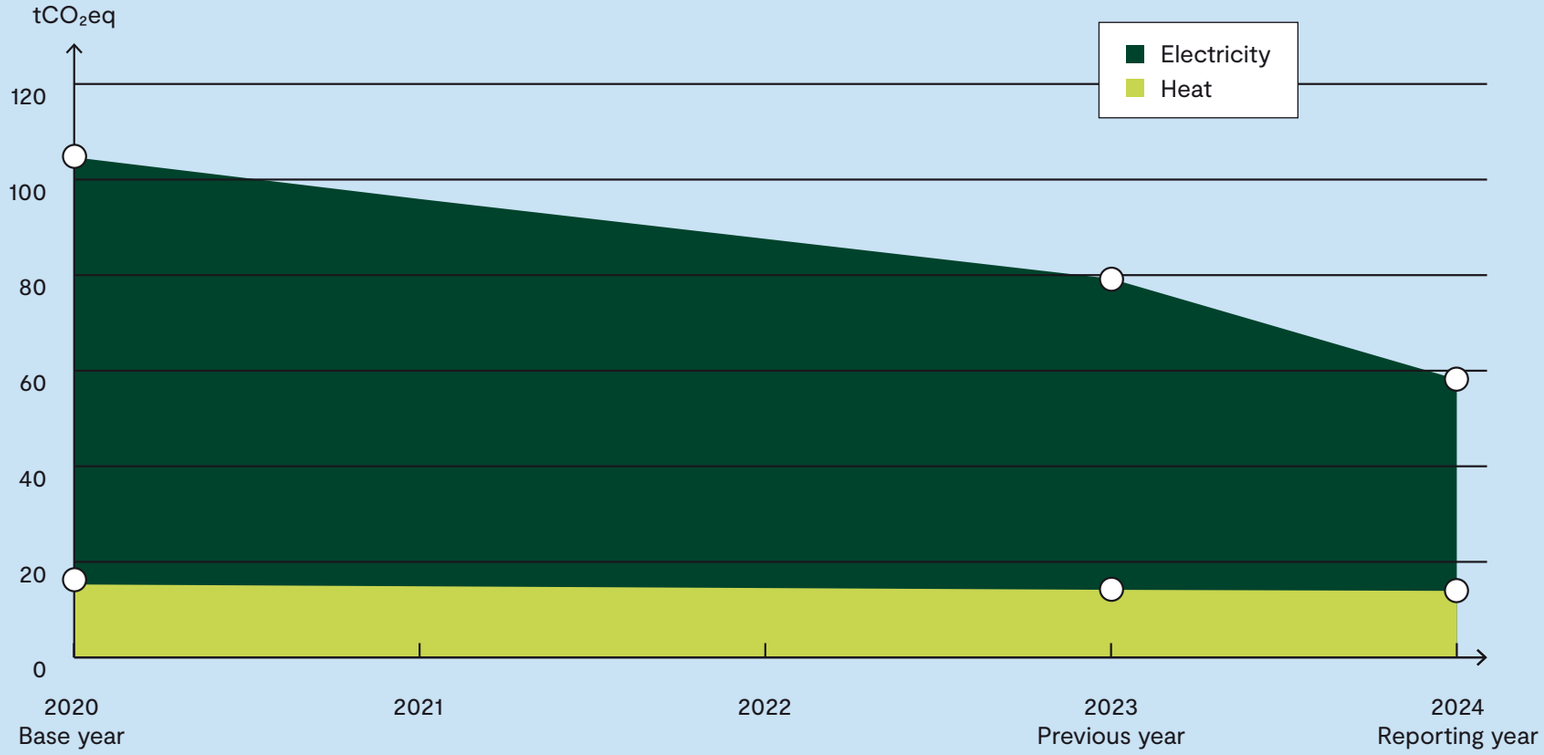


3.2.3 Scope 2

Nordic Computer is supplied with energy in the form of electricity and district heating for its facilities in accordance with the location-based method. Market-based purchase is not used. Measured values for the physical consumption have been provided by the utilities. Between the base year and the previous year, two major changes have happened: Nordic Computer's facilities have been expanded, which mainly is relevant for the supply of heating, and a data center has been closed down, which is relevant for the consumption of electricity. From previous year to reporting year, a new installation has been made that transfers excess heat from the servers in the test facilities to the storage building, thus reducing the need for external heating.

The evolution of scope 2 emissions is shown in Figure 2. A reduction of scope 2 emissions of 44% has been realized since base year, predominantly because emissions from electricity have been halved in the period. There are two contributing factors at play; the electricity consumption has decreased by 26% at the same time as the carbon intensity of electricity has dropped by 33%.

Figure 2: The yearly scope 2 emission have been reduced by 44% from base year to reporting year.



3.2.4 Scope 3

Estimates of the scope 3 contributions from the electricity consumed by sold devices at customers' premises have been carried out as described in A.2 Estimation of use-phase emissions. The results are shown in Figure 3, where it can be seen that for the reporting year these scope 3 emissions are estimated to lie 12% higher than for the base year. This change reflects changes in emission factors from year to year, different sets of sold devices, and an increase in the number of sold devices of 30%.

The scope 3 emissions from operation of sold devices completely dominate the picture by being two orders of magnitude larger than any other contribution, and approximately 20 times larger than the sum of all other emissions from all scopes taken together – see also Figure 5 on page 18.

Figure 3: Scope 3 emissions from operation of sold devices at customers' premises

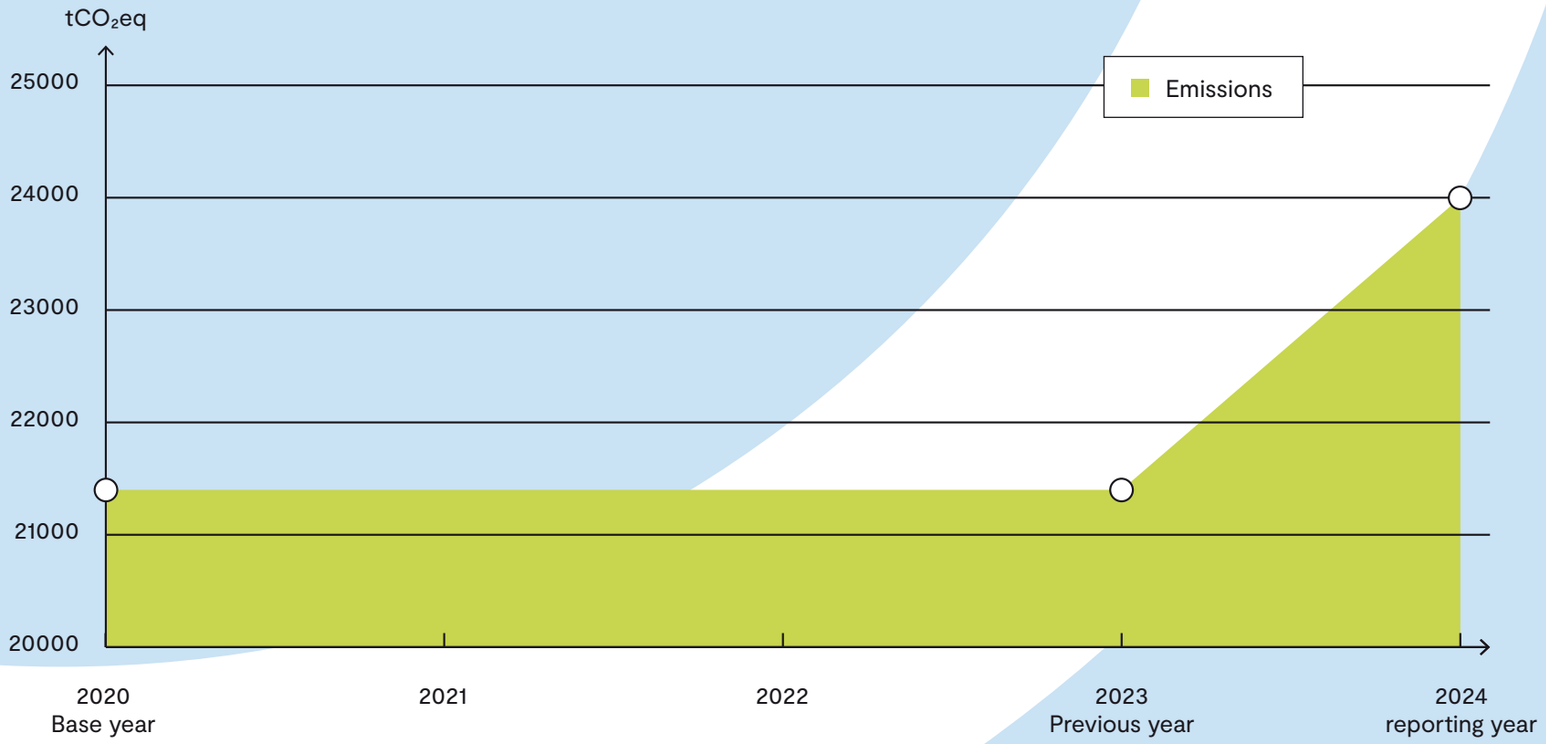
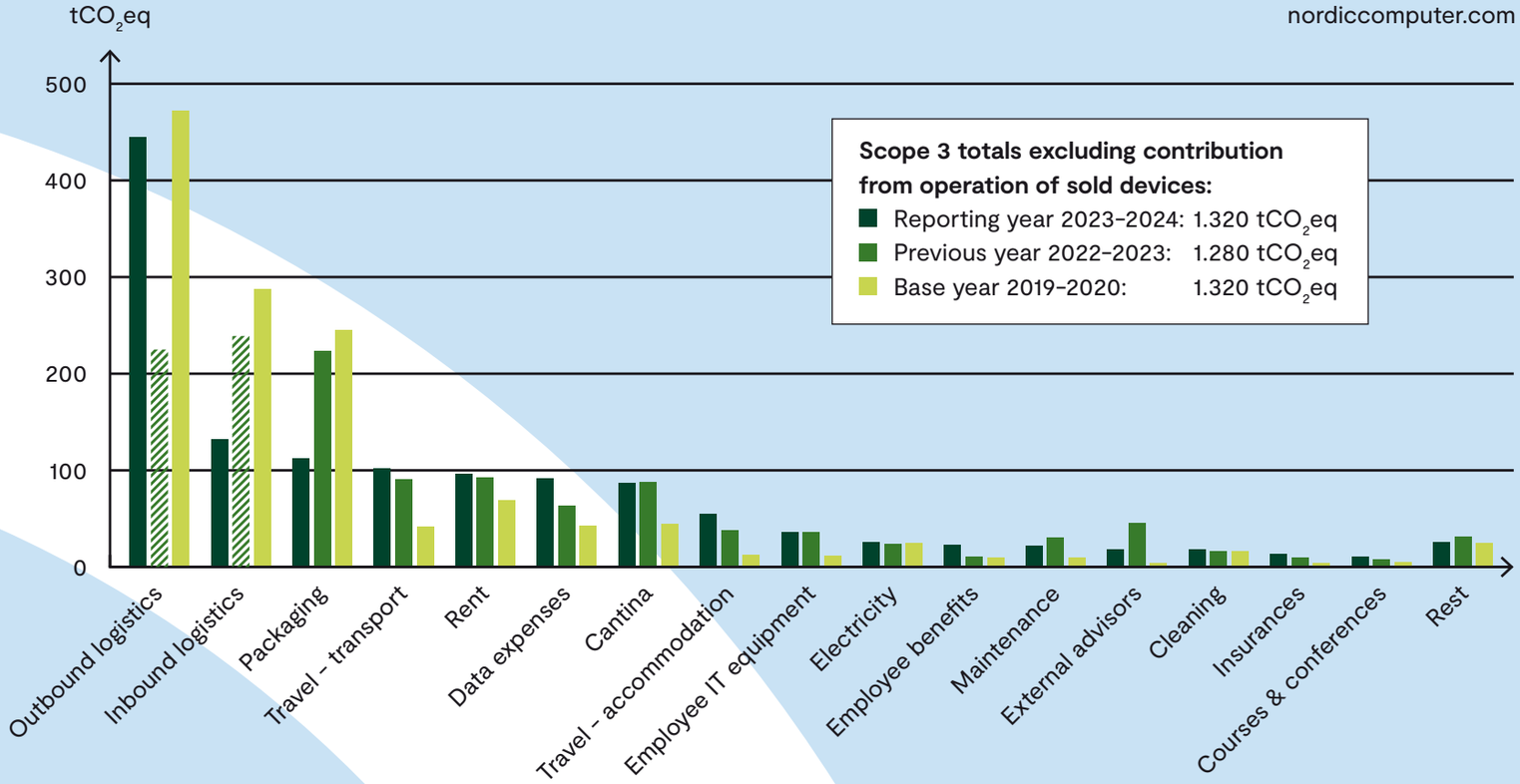


Figure 4 shows a drill down of the remaining scope 3 emissions. These are dominated by inbound and outbound logistics, packaging materials, business travel and accommodation, rent of premises, data expenses, and the cantina.

Figure 4: Drill down of all scope 3 contributions except the contribution from operation of sold devices. For the year 2022-2023, data from a major logistic supplier didn't contain the split between inbound and outbound logistics. Hence the contribution has been split evenly between inbound and outbound logistics. The affected bars in the chart are shaded.



The column marked "Rest" is a sum of individual contributions smaller than 10 tCO2eq. It covers emissions from purchases of hand tools, energy-related scope 3 emissions from fuel used in cars, office supplies, heat, waste and water.

Most of these scope 3 contributions have been calculated from monetary values. The exceptions are inbound and outbound logistics, packaging, energy-related scope 3 emissions, electricity, heat, water, and waste. For the latter four, physical data have been gathered from the utilities and the recycling company. For logistics, the larger companies have delivered emission reports, while monetary measures have been used for a few of the smaller players.

The text box in Figure 4 shows the sums of all scope 3 emissions excluding the contribution from operation of sold devices, i.e. the sum of all bars in the chart, for each year. These sums of scope 3 emissions have been more or less constant from base year to reporting year.

Not all categories of scope 3 emissions have been constant though. Especially, Nordic Computer's efforts to reduce scope 3 emissions from logistics and packaging have been effective. Outbound as well as inbound logistics and packaging have all been reduced since base year – the latter two have been cut by half. In the same period the number of devices sold has increased by 30%. Increases in scope 3 emissions in Figure 4 are most significant for business travel, cantina, data expenses and rent of premises.

3.2.5 Emission overview

The results for scope 1, 2 and 3 are summarized in Table 3, and the relative distributions of scope 1, 2, and upstream and downstream scope 3 are shown in Figure 5.

Table 3: Scope 1, 2, 3 and total emissions.

Numbers in bold have been affected by the recalculation and thus differs from last year's report.

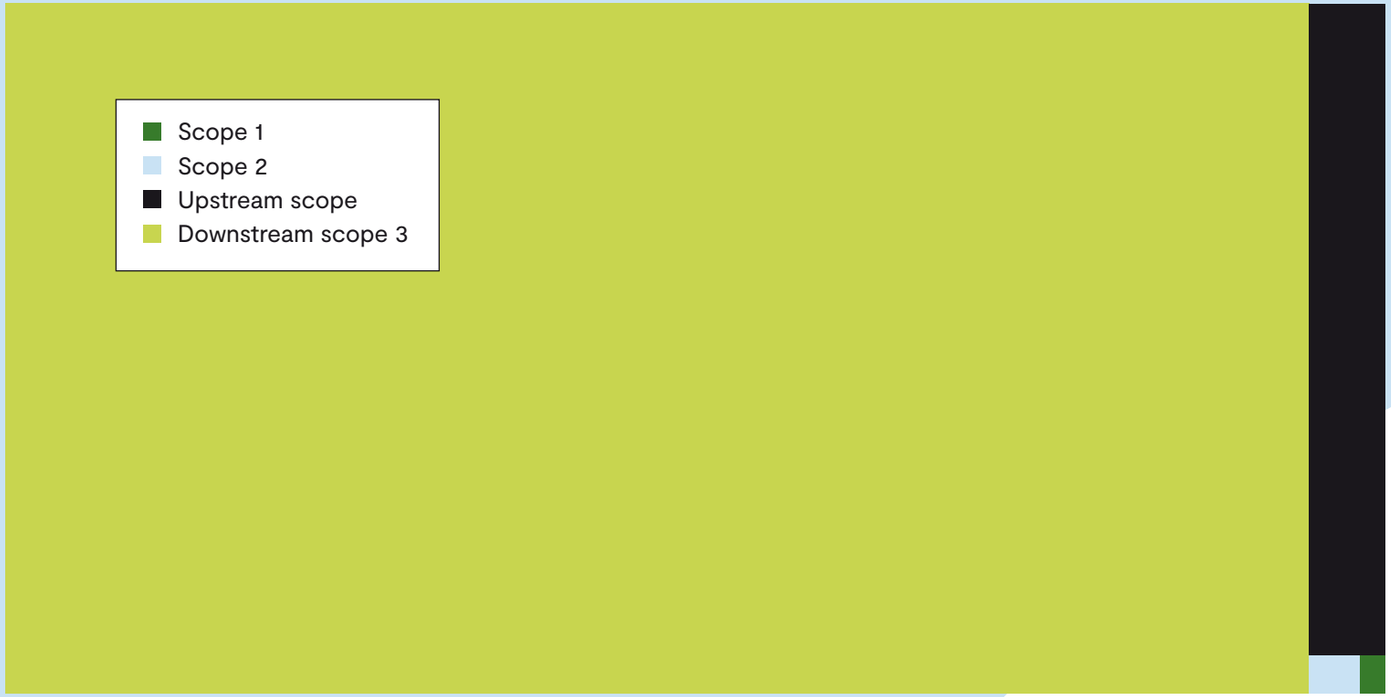
The old values are stated in brackets to facilitate comparison.

Further details on the recalculation can be found in appendix A.1 *Recalculation of baseline and past results*.

	Reporting year relative to base year	Reporting year 2023-2024	Previous year 2022-2023	Base year 2019-2020	Target 2030 relative to base year
Scope 1 GHG emissions	**%**	**tCO_2eq**	**tCO_2eq**	**tCO_2eq**	**%**
Gross Scope 1 GHG emissions	51%	32	47	62	50%
Percentage of Scope 1 GHG emissions from regulated emission trading schemes	-	0	0	0	-
Scope 2 GHG emissions					
Gross location-based Scope 2 GHG emissions	56%	58	79	105	50%
Gross market-based Scope 2 GHG emissions	-	0	0	0	-
Significant scope 3 GHG emissions					
Total Gross indirect (Scope 3) GHG emissions	110%	$24.7 \cdot 10^3$	**$22.7 \cdot 10^3$** ($21.3 \cdot 10^3$)	**$22.7 \cdot 10^3$** ($20.9 \cdot 10^3$)	50%
1 Purchased goods and services	-	427	**521** (472)	**392** (395)	-
2 Capital goods	-	22	**31** (34)	10	-
3 Fuel and energy-related activities (not included in Scope 1 or Scope 2)	-	35	**37** (39)	**42** (53)	-
4 Upstream transportation and distribution	76%	577	**464** (470)	**760** (752)	50%
5 Waste generated in operations	-	0.3	0.4	**0.2** (1)	-
6 Business traveling	-	157	**129** (141)	**55** (54)	-
7 Employee commuting	-	Out of scope*	Out of scope*	Out of scope*	-
8 Upstream leased assets	-	97	**93** (104)	**69** (70)	-
9 Downstream transportation	-	0	0	-	-
10 Processing of sold products	-	0	0	-	-
11 Use of sold products	12%	$24.0 \cdot 10^3$	**$21.4 \cdot 10^3$** ($20.0 \cdot 10^3$)	**$21.4 \cdot 10^3$** ($19.6 \cdot 10^3$)	50%
12 End-of-life treatment of sold products	-	0**	0**	-	-
13 Downstream leased assets	-	0	0	-	-
14 Franchises	-	0	0	-	-
15 Investments	-	0	0	-	-
Total GHG emissions					
Total GHG emissions (location-based)	112%	$25.4 \cdot 10^3$	**$22.8 \cdot 10^3$** ($21.4 \cdot 10^3$)	**$22.9 \cdot 10^3$** ($21.1 \cdot 10^3$)	50%
Total GHG emissions (market-based)	-	$25.3 \cdot 10^3$	**$22.7 \cdot 10^3$** ($21.3 \cdot 10^3$)	**$22.8 \cdot 10^3$** ($21.0 \cdot 10^3$)	-

*See 2.1.3 Value chain scope on page 7, **See 2.2.2 Estimates and uncertainties on page 9.

Figure 5: Relative distribution of emissions for reporting year 2023-2024. Downstream scope 3 (operation of sold devices) dominates with 94.5% of all emissions. Upstream scope 3 contributes with 5.2%, while scope 2 and 1 only contributes with 0.2% and 0.1% to the total emissions of Nordic Computer.



3.2.6 Biogenic emissions

Emissions from known combustion or bio-degradation of biomass are not included in scopes 1, 2, and 3 above in accordance with the GHG Protocol. These biogenic emissions are coming from biofuel mixed into diesel and petrol used for the company cars.

Table 4: Biogenic emissions from combustion of biofuel mixed into diesel and petrol for reporting year 2022-2023.

Biogenic emissions [tCO_2eq]	
From diesel	From petrol
2.2	1.0

3.3 Emission reduction targets

In the Climate Report for fiscal year 2022-2023 an emission reduction target of 50% in 2030 relative to the baseline in fiscal year 2019-2020 was established. The target setting was inspired by the overall EU reduction target on one hand [6], and the SBTi -approved reduction targets and pathway defined by the International Telecommunication Union (ITU) for the ICT industry on the other [7]. Both targets correspond to an emission reduction of approximately 45% in the period from 2020 to 2030. Setting a target of 50% is thus more ambitious and will match or outperform the reduction pathways that EU and ITU follow.

Nordic Computer's emission reduction target for 2030 is unchanged relative to the baseline. However, as the baseline has been recalculated, the absolute target values have changed as shown in Table 5.

Table 5: 2030 targets for Nordic Computer. Numbers in bold have been affected by the recalculation and thus differs from last year's report. The old values are stated in brackets to facilitate comparison. Further details on the recalculation can be found in appendix A.1 Recalculation of baseline and past results.

Emission reduction targets for Nordic Computer			
Base year: Fiscal year Oct. 2019 to Sept. 2020		Target year: Fiscal year Oct. 2029 to Sept. 2030	
	Baseline value [tCO_2eq]	Reduction factor	Target value [tCO_2eq]
Scope 1	62	50%	31
Scope 2	105	50%	53
Scope 3	**$22.7 \cdot 10^3$** ($20.9 \cdot 10^3$)	50%	**$11.4 \cdot 10^3$** ($10.5 \cdot 10^3$)
All scopes 1+2+3	**$22.9 \cdot 10^3$** ($21.1 \cdot 10^3$)	50%	**$11.5 \cdot 10^3$** ($10.6 \cdot 10^3$)

The 50% reduction target is applied separately to each of the scopes 1, 2 and 3. But it also applies separately for the two major scope 3 contributions, *upstream transportation* and *distribution and use of sold products,* as shown in Table 3.

Going towards 2030, Nordic Computer expects an increased interest in reusing and extending the lifetime of data center equipment. Several factors will drive this development, one being the ambitions to reduce climate impact. At the same time, there will be more data center equipment in operation than ever before, which increases both the market size for lifetime extension in the IT service business, as well as the number of available second-hand units in the market for the retail business. In other words, Nordic Computer is looking into a growing market.

This poses a challenge in relation to cutting absolute emissions. However, there are levers that pull in the other direction. The very ambitious plans for decarbonization of electricity and electrification of transport will help reduce the climate impact of transporting and operating the equipment. Exactly how these opposing developments will balance out in the long run, only time will show.

3.4 Transition plan

The business model of Nordic Computer is centered around maximizing utilization of existing equipment in data centers by selling tested second-hand devices and components, and by providing service and spare parts for devices, including those that are more than 3 to 5 years old. As already discussed in *2.2.2 Estimates* and uncertainties on page 5, a second-hand unit is part of an IT setup in a data center because of an operational need. Keeping an existing device in operation for longer is thus an effective way to displace the need for production of a new device.

This is important, as the production of an IT unit is an extremely resource- and energy-intensive process resulting in GHG emissions that are much larger than emissions from transport and handling of a second-hand unit. Nordic Computer's existing business model thus makes good sense from an overall climate perspective, and Nordic Computer is not excluded from EU Paris-aligned benchmarks.

With a target of a 50% reduction in emissions from 2020 to 2030 Nordic Computer has set a more ambitious target than EU and ITU as described in *3.3 Emission reduction targets*. Nevertheless, for scope 1 and 2 emissions that are within Nordic Computer's own control, the 2030-targets are very close to being met more than 5 years ahead of time. As is evident from Table 3, reductions of 49% and 44% for scope 1 and 2, respectively, have been realized already. These reductions have happened at the same time as the number of units sold has increased by almost 30%.

For scope 1, reductions have been achieved by an increased focus on the need for driving, resulting in fewer trips and shorter distances travelled by company cars. Furthermore, a shift from ICE cars to plug-in hybrids and EV's is well underway. This is happening organically as cars are going to be replaced anyway. At present, almost half of the ICE fleet has been replaced, and this will continue going forward. The effect of these scope 1 initiatives is very visible in Figure 1.

The obvious way to reduce scope 2 emissions is to consume less energy. This has been achieved for both electricity and heat, with reductions of 23% and 8% since base year, respectively. Efforts along this path will continue, although this becomes increasingly difficult due to minimum requirements in relations to storage and test conditions for equipment. Another contributing factor is the ongoing decarbonization of both electricity and district heating. A drop of 30% in the carbon intensity of electricity since base year is directly reflected in the scope 2 emissions. This will continue going forward. According to Denmark's Climate and Energy Outlook 2020, the renewables share of electricity consumption is expected to exceed 100% from 2027, while renewables share of district heating is expected to reach 79% in 2030 [8].

The latter demonstrates the huge effect of a combined effort in companies, municipalities, regions, countries and on the overall EU level. In March 2023, the EU agreed to increase its binding target to a minimum of 42.5% renewable energy in the overall EU energy mix by 2030 [9]. With the electricity grid being the easiest part of the total energy system to decarbonize, this will lead to rapidly decreasing carbon intensities in the EU in general. This is crucially important for decreasing Nordic Computer's scope 3 emissions, as the dominant part is due to the electricity consumed by devices sold to customers.

Freight is the other hurdle in relation to scope 3. The ongoing electrification of transport will help reduce the emissions – especially from road transport within Europe. E-fuels for air transport were expected to make some landmarks before 2030, but several backlashes lately have made this a much more uncertain bet. But Nordic Computer is not a bystander when it comes to freight emissions.

By maximizing the utilization of the capacity of individual shipments, actively choosing the freight operator, the mode of transport, and the allowed transit times Nordic Computer has already demonstrated a significant reduction of the scope 3 emissions from freight. These efforts will continue going forward.

Nordic Computer does not own its facilities and the only major source of locked-in emissions is the stock of second-hand devices and components. These will give rise to emissions when sold and put into operation. A crude estimate of the size of those emission is presented in *A.3 Estimation of locked-in emissions on stock*. The decreasing carbon intensity will reduce these locked-in emissions over time.

Time and effort are Nordic Computer's primary investment in reducing climate impact. Apart from being almost a sport for employees, the initiatives often go hand in hand with cost reductions. For instance, becoming aware of shipments that are not urgent allows Nordic Computer to select slower modes of transport. This not only lowers the emissions but also the cost.
This transition plan is approved by management and the board of Nordic Computer.

3.5 Policies

Nordic Computer has three policies related to climate change mitigation and energy efficiency. Climate change adaptation and deployment of renewable energy are topics not yet covered. All policies are owned by the CEO who is ultimately responsible for the implementation and maintenance of the policies. In daily operation, the implementation of a policy, or part of a policy, is delegated to the manager who is responsible for the business area covered.

3.5.1 Climate policy

Climate policy covers all climate mitigation activities in the value chain of Nordic Computer. Relevant topics are delegated to be covered in detail in *Policy for logistics and handling* and *Purchase policy*. This leaves the subjects of energy efficiency in own operations, training of employees, and collaboration with external stakeholders, other than logistic companies and sellers of equipment, to be covered in full in *Climate policy*.

The importance of energy efficiency is built into the company culture at Nordic Computer. The entire business model is based on maximizing the utilization of resources, which fosters a high awareness among employees. Nevertheless, it is important that energy efficiency reviews take place regularly. This is described in *Climate Policy*. In these reviews, participants take a critical look at the overall picture of where energy is consumed or wasted in the company in order to spot potential for improving the energy efficiency.

The section on training of employees defines the expectations in relation to creating and maintaining awareness about climate change mitigation in the organization. It emphasizes the importance of introducing new employees to Nordic Computer's mitigation targets and efforts, and the continuous strive to reduce emissions internally as well as in the value chain. The importance of management demonstrating an unambiguous prioritization of mitigation activities is emphasized, as well as informal and dynamic knowledge sharing among employees.

Reduction of scope 3 emission constitutes a special challenge. Not only are the scope 3 emissions orders of magnitude larger than scope 1 and 2 emissions but they are also taking place outside Nordic Computer's own operations. Scope 3 emission reductions will thus have to take place in close collaboration with the most relevant external stakeholders. These are customers, suppliers of packaging and logistic services for freight, utilities, authorities and the political level when it comes to decarbonization of the electricity grid. The latter is required to reduce emissions from sold devices operated by Nordic Computer's customers.

Fortunately, this is exactly where the ambition level is very high, at least in the EU. However, real change requires more than promises, which is why *Climate policy* emphasizes that Nordic Computer should not waste an opportunity to confirm and emphasize towards authorities, utilities and the political level just how important it is, that the decarbonization ambitions are actually met or surpassed.

3.5.2 Policy for logistics and handling

The scope for Policy for logistics and handling is all activities related to the selection of logistic companies, ordering of shipments, packing, sending, receiving and unpacking items. The selection of preferred logistic partners in Nordic Computer is a compromise amongst a number of criteria. One of these criteria is the climate profile of the shipments offered, along with the flexibility to choose longer delivery times with a reduced climate impact. The latter should be used whenever urgency is not an issue.

The policy also describes how optimization of packaging can reduce the amount of packaging material used at the same time as the utilized capacity in each shipment is maximized. The latter will reduce the overall number of shipments and thereby the climate impact. Reuse of packaging materials is also a priority that reduces waste and the need for new materials, which also contributes to lower climate impacts.

3.5.3 Purchase policy

Purchase policy encompasses all purchases within Nordic Computer. Like many other companies, the purchase department has a big impact on the total emissions of Nordic Computer. It is the purchase department that decides which items to buy, where to buy them and how they reach Nordic Computer. This is covered in general in *Purchase policy*. However, the purchase of second-hand devices is given special attention in the policy, as the accumulated impact of all other purchases vanishes in comparison. While the freight itself is covered in Policy for logistics and handling, the location of a device at time of purchase is not. As slow shipments and short distances result in lower emissions, *Purchase policy* defines nearby locations as a priority to reduce the distance and allowing for a lower freight speed.

3.6 Actions

This section describes the major climate-related initiatives Nordic Computer has implemented since the base year 2019-2020, as well as the planned activities to reduce impact further towards 2030.

3.6.1 Implemented actions

Employee training: Employees in Nordic Computer have participated in a company-wide training course on the triple bottom line, also known as 3P or People, Profit and Planet. The basic idea is to cultivate the company mindset that all decisions must be based on an evaluation of the impacts on people, the environment and the climate, on par with a traditional economic judgement. As an integrated part of the training course, employees were taught to use kaizen boards as a tool to facilitate such multidimensional decisions. The effect of this initiative is very hard to measure, but it adds to the foundation for all other initiatives.

Slow freight: By deliberately choosing slow freight options when urgency is not an issue, Nordic Computer has been able to reduce scope 3 emissions related to freight. As simple as this might seem, it requires changes in internal procedures and a confrontation of habits in the market. The challenge is to know when a shipment is not urgent as the default mode of operation is to expect that everything is urgent. Questions have to be posed, and surprised customers will have to actually consider whether a shipment is urgent or not.

Maximum utilization of freight capacity: A way to reduce the number of shipments is to include more in each shipment. As volume scales as radius to the third power, while surface area only scales as radius to the second power, this also allows for an improvement of the ratio between goods and packaging material. The major challenges to implement this have been a need for better planning of shipments and the development of new ways to package larger shipments without compromising on the protection of the units. Nordic Computer has made several successful improvements in relation to both of these challenges. The latest improvement is the development of a special carboard-based packaging that replaces wood. Not only does this solution reduce the material footprint, it also takes up less space allowing more units in one shipment.

Bundling of items: Instead of dispatching every single order as soon as it is received, a dispatch now happens at a specific time of day. The result is that customers can add to the same shipment until the time of dispatch. This reduces the number of individual shipments, the amount packaging material used, and thereby the climate impact. The frequency of dispatch can be defined per customer. For some customers the system is set up for a weekly dispatch.

Despite the low-tech nature of the freight initiatives above, the surprising result is that Nordic Computer has managed to reduce the scope 3 emissions from freight by 25% compared to base year. This has happened simultaneously with an 30% increase in the number of units shipped.

Utilization of excess heat: In Nordic Computer's test facility a number of servers are giving rise to excess heat. This heat used to be lost to the outdoor surroundings through the ventilation and cooling system. To avoid this energy loss, a new heat-transferring installation has been made. It transfers the excess heat from the test facilities to the storage building where it reduces the need for external heating.

Closure of hosting center: Until 2022 Nordic Computer operated a hosting center as a legacy of earlier activities. The center did not require much attention, but utilization of the hosting capacity was low and the electricity consumption for running the center and the associated cooling was considerable. Consequently, it was decided to close the center.

Switching off test equipment: Professional IT equipment is designed to be operating continuously. The software setup consists of layers of software running on top of each other. This means that the start-up procedures can require quite some interaction with a sequence of complicated steps that have to be carried out over a number of devices. The rule is continuous operation while start up is an exception nothing like flicking a switch. Nevertheless, Nordic Computer has been evaluating the options to lower the power consumption in the test center. The result is that part of the test setup that is not used on a daily basis, is switched off when not in use.

These two electricity-saving actions alone led to a reduction of the electricity consumption by around 30% corresponding to a reduction in scope 2 emissions by 25%.

3.6.2 Planned actions

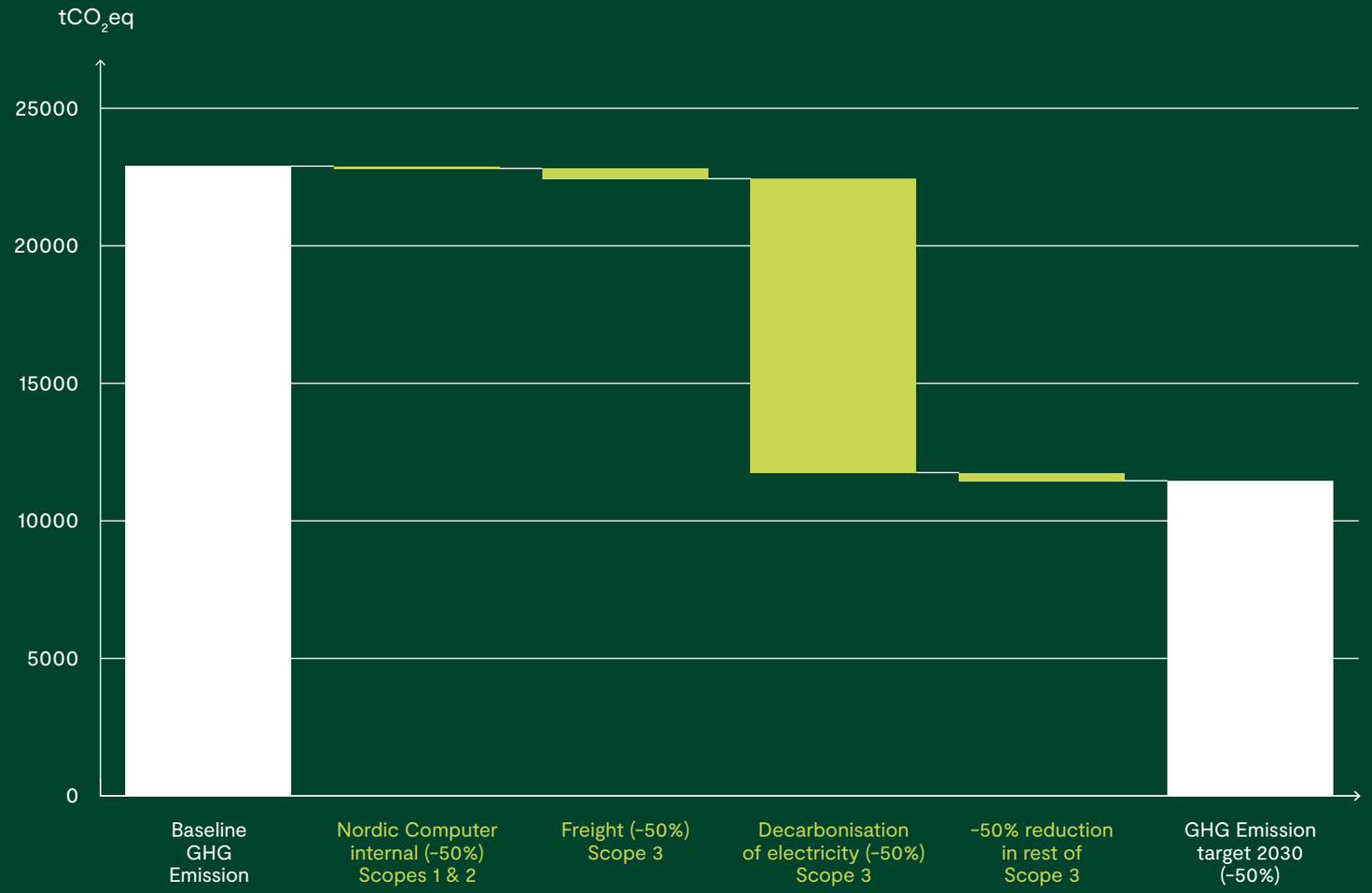
Figure 6 depicts the path towards the 50% reduction target in 2030. It is evident that whatever Nordic Computer does internally, and in collaboration with its suppliers, reaching the 2030 target is ultimately depending on a reduction of the carbon intensity of the electricity used in their customers' data centers.

This does not mean that Nordic Computer will adopt a wait-and-see attitude. As all emission reductions matter, Nordic Computer will continue the ongoing efforts and strive for reducing scope 1 and 2 emissions further. Collaboration with suppliers in efforts to reduce scope 3 emissions will continue as well. These are continuously ongoing processes with lots of small steps.

As described in *3.4 Transition plan* a phase out of ICE vehicles is already well underway and will continue in the coming year.

Finally, Nordic Computer will put pressure on logistic partners to deliver emission data for the different freight options. Not only will that make freight emissions more transparent to Nordic Computer, it will also allow Nordic Computer to offer customers an informed choice when they select between different ways of shipment. A reduced climate impact may incentivize more customers to select slow freight options.

Figure 6: Emission reduction target for 2030 along with the distribution of reductions to reach the target.



4 Conclusion

This Climate Report has presented the climate impact of the entire value chain of Nordic Computer from October to September in the fiscal years 2019-2020 (base year), 2022-2023, and 2023-2024 (reporting year).

All scope 1 emissions are caused by the burning of fossil fuels in cars leased or rented by the company. In 2023-2024 it amounted to 32 tCO_2eq in total. This represents a reduction of 49% during the 4-year period since base year, which brings Nordic Computer very close to the 2030 target of a 50% reduction. The reduction has been achieved by driving fewer kilometers and from an ongoing shift from ICE vehicles to plug-in hybrids and EV's.

The scope 2 emissions of 58 tCO_2eq stem from the use of electricity and district heating in Nordic Computer's premises. Three major configurational changes have happened since base year: A data center has been closed down, the premises have been expanded, and excess heat from the test facilities is now transferred to the storage building. The result is a significant reduction of electricity usage and also a slight decrease in the use of heat. Together with a 30% reduction of the carbon intensity of electricity in Denmark, this results in a 44% reduction of scope 2 emissions since base year. With a reduction target of 50% in 2030, Nordic Computer is also getting close the scope 2 target.

By far, the dominant scope 3 contribution originates from the electricity used by devices sold to customers and operated in their data centers. These emissions are 20 times larger than all other emissions in all scopes combined. Since base year these emissions have increased by 12% at the same time as the number of sold devices has increased by 30%. The decarbonization of electricity worldwide accounts for the difference. Going forward, the plans for further decarbonization are expected to reduce these emissions significantly.

The remaining scope 3 emissions amounts to 1320 tCO_2eq, which is largely unchanged since base year. This hides the fact, that some categories of scope 3 emissions have decreased while others have increased. Inbound and outbound logistics give rise to emissions of 577 tCO_2eq, which is a reduction of 24% since base year, i.e. about halfway to the 2030 target of 50% reduction. These reductions have been achieved by inventing new ways of packaging that allows for an increased number of devices contained in each shipment, and by using slow freight when urgency is not an issue. These initiatives have also reduced the emissions from packaging materials with 54%. The scope 3 categories that have increased emissions since base year are business travel, data expenses, food for the cantina, and rent of the premises.

In conclusion, Nordic Computer is very close to fulfil the 2030 targets for scope 1 and 2. For scope 3, the emission reductions realized so far for logistics and packaging have been neutralized by higher emissions for business travel, data expenses, the cantina and rent of premises. The scope 3 emissions from the operation of sold devices have increased by 12%, while the number of sold devices has increased by 30%.

Appendix

A.1 Recalculation of baseline and past results

Nordic Computer has chosen to recalculate all previous results including the baseline. The recalculation is based on exactly the same input, but the output is slightly different. There are several reasons for this choice:

New set of worldwide emission factors: Emissions from sold units operating at customers' premises are two orders of magnitude larger than any other contribution in the value chain of Nordic Computer. These emissions are estimated as described in appendix *A.2 Estimation of use-phase emissions*. Foundational for that estimate is a consistent set of emission factors for electricity that covers all countries of Nordic Computer's customer base, which in practice means the entire world as new countries are added often. In addition, all years from 2019 and up till recently, preferably 2023 – otherwise 2022, should be covered. These criteria are fulfilled by the worldwide dataset provided by Our World in Data [10]. What has happened since the baseline was defined, is that all emission factors in that set have been updated back in time. For many countries the adjustments are considerable. That calls for one of two options:

1. Either you can accept that your baseline is no longer comparable to current and future estimates. However, it's hard to establish the value of a baseline in that case. Furthermore, it's not in alignment with ESRS 1.
2. Or you can recalculate the baseline based on the same input apart from the updated set of emission factors that better reflects the reality than the old one.

Nordic Computer has chosen the latter option.

Adjustment for inflation: Inflation is an issue for all emission factors based on a currency. Even if a currency-based emission factor is a good representation of the reality one day, it will deteriorate over time due to inflation. This does not happen for emission factors based on physical measures: A kilometer does not change over time – it is the same today as it was yesterday and as it will be tomorrow. Unfortunately, that's not the case for a currency. Consequently, Klimakompasset has decided to adjust currency-based emission factors for inflation. This means that even the emission factors that haven't been updated for years will be adjusted for inflation going forward. This is an obvious improvement that ensures more consistency when comparing results across several years – precisely what Nordic Computer needs to do. However, to gain from this benefit, it is necessary to recalculate results for previous years, including the baseline.

Fiscal year and emission factors: The fiscal year in Nordic Computer runs from October 1st to September 30th. This means that emission factors for the calendar year will never be ready at the end of a fiscal year. The obvious alternative is to use the emission factors for the previous year, i.e. the calendar year in which the fiscal year started. If that is done consistently, there are no problems. Unfortunately, when Nordic Computer established the baseline in last year's Climate Report, emission factors for 2020 were used, as they were available. However, as the baseline year started in 2019, this is not in line with a consistent choice of year for emission factors. Recalculation of the baseline with emission factors for 2019 will remedy this inconsistent choice of emission factors.

Correction of error: Preparing for this report it was discovered that some incorrect data had accidentally been introduced in the calculation for last year's Climate Report. This error affects the resulting value for category 1 of the scope 3 emissions for the year 2022-2023 in Table 3. A recalculation of the results for that year will correct the error.

All values for the base year 2019-2020 and the year 2022-2023 have been recalculated in this Climate Report. Updated numbers in Table 3, Table 5 and Table 6 are marked with red, while the previous values are stated in brackets below for comparison.

A.2 Estimation of use-phase emissions

For a specific device, it is possible to calculate the use-phase emission given the typical annual energy consumption (TEC) of the device, the associated carbon intensity of the electricity at location of use, and the period the device will be operating.

Summing up these scope 3 contributions from all devices sold in a specific year will provide the total climate impact of sold products in that year (category 11 in Table 3). It is worth emphasizing that the calculation has to include the use-phase emissions for the entire use phase of a device, not only for the year it was sold. As we can't know the emission factors of the future, the relevant emission factor for the year a device was sold has been applied to the entire use phase.
Some OEMs provide data for TEC, but for many devices it is not part of standard specifications. Instead, a qualified estimate on an average value for each device type is applied. For some devices types, like servers, TEC is often published. This qualifies the determination of the average. For other device types, the average has to rely on power ratings of devices and knowledge about typical use cases.

The destination country for each sold device is known, which implies that the carbon intensity can be looked up for the given year [10]. If data for the relevant year were not yet available, data for the latest year available have been used.

As argued in section *2.2.2 Estimates and uncertainties* and in appendix A.4 *Use-phase period of second-hand devices*, the use-phase period for a second-hand device is comparable to the initial use-phase period of a new device. Since OEMs typically assume a use-phase period between 3 and 5 years for a new device, a 4-year use-phase period has been assumed in these calculations.

With these assumptions and estimates, the following results have been obtained:

Table 6: Estimate of emissions from customers' use of sold products. Numbers in bold have been affected by the recalculation and thus differs from last year's report. The old values are stated in brackets to facilitate comparison. Further details on the recalculation can be found in appendix A.1 *Recalculation of baseline and past results*.

Emissions from the use phase of sold products [tCO_2eq]		
Reporting year 2022-2023	**Previous year 2022-2023**	**Base year 2019-2020**
$24.0 \cdot 10^3$	**$21.4 \cdot 10^3$** ($24.0 \cdot 10^3$)	**$21.4 \cdot 10^3$** ($19.3 \cdot 10^3$)

A.3 Estimation of locked-in emissions on stock

The only locked-in emissions for Nordic Computer are caused by the devices in stock that are going to emit GHG during their later use phase. A crude estimate of the size of the locked-in emissions will thus follow the same approach as described in *A.2 Estimation of use-phase emissions*. The only differences, apart from a different set of devices, is that assumptions will have to be made about the time of sale and the destination countries.

To make things simple, it is assumed that all devices in stock are sold instantaneously and that the destination countries follow the same distribution as the devices sold in the given year. The easiest way to do the latter in practice, is to calculate the weighted average of the emission factor for a given device type from the distribution of sold products. This average is then used for all devices of the given type on stock.

This approach results in estimated locked-in emissions of $18.5 \cdot 10^3$ tCO_2eq. This is a decrease from last year's value of $21.8 \cdot 10^3$ tCO_2eq (recalculated). As the number of units on stock is almost unchanged, the decrease reflects changed emission factors, another distribution of units on stock, and/or another distribution of items on receiving countries.

A.4 Use-phase period of second-hand devices

More as a rule than an exception professional IT equipment is replaced prematurely for non-technical reasons.

Often new equipment comes with an attached service agreement that runs out after three to five years. If it is possible to extend the service agreement at all, it is extremely expensive to do so.

As a consequence, many operators replace equipment when the service contract runs out. In addition, other factors like habits, a desire to have the latest new equipment, and early replacement seen as a mitigation of the risk of failures, probably also play an important role. The result is that a lot of well-functioning equipment is either scrapped or enters the second-hand market.

There are four primary drivers for Nordic Computer's customers to buy second-hand IT equipment. They are, in no specific order:

1. Climate impact – customers want to lower their impact
2. Price – second-hand equipment is cheaper
3. Better service – one service partner instead of a number of service contracts with different OEMs
4. Fit into existing setup – an older device is needed as it has to fit into an existing setup

None of these drivers incentivize shorter use-phase periods than for a new device, very much on the contrary. A customer prioritizing a low climate impact will be keen to keep existing equipment running for as long as possible. If low cost is a driver, it doesn't make sense to change often. And if a customer has a service contract with Nordic Computer, it's most likely because stability, convenience, easy access to spare parts, and a quick service response is a priority over new devices. Finally, a customer buying second-hand equipment to keep an existing setup running is already prioritizing lifetime extension of an existing setup.

The general picture is that new equipment typically enters the second-hand market after 3 to 5 years. Operators of second-hand equipment do not have the same urge to replace equipment just to have it replaced. In conclusion, second-hand equipment will often have a use-phase period as long as for a new device.

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A.5 Emission factors

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Topic	Scope 1	Scope 2	Scope 3	Biogenic	Year	Source
Fuels and transport						
Aviation, jet fuel (incl. RFI)			0.2513 $kgCO_2eq/DKK$		2019	Klimakompasset
Aviation, jet fuel (incl. RFI)			0.2446 $kgCO_2eq/DKK$		2022	Klimakompasset
Diesel (car)	0.1342 $kgCO_2eq/km$		0.0323 $kgCO_2eq/km$	0.0091 $kgCO_2eq/km$	2022	Klimakompasset
Diesel (car)	2.511 $kgCO_2eq/l$		0.6068 $kgCO_2eq/l$	0.1737 $kgCO_2eq/l$	2019	Klimakompasset
Diesel (car)	2.512 $kgCO_2eq/l$		0.6056 $kgCO_2eq/l$	0.1694 $kgCO_2eq/l$	2022	Klimakompasset
Diesel (truck)			0.0655 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Diesel (truck)			0.0596 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Diesel (truck)			0.1245 $kgCO_2eq/t*km$	0.0068 $kgCO_2eq/t*km$	2022	Klimakompasset
Hybrid (car)	0.1074 $kgCO_2eq/km$		0.0298 $kgCO_2eq/km$	0.0075 $kgCO_2eq/km$	2022	Klimakompasset
Hybrid (car)	2.1719 $kgCO_2eq/l$		0.6035 $kgCO_2eq/l$	0.1520 $kgCO_2eq/l$	2022	Klimakompasset
Petrol (car)	0.1584 $kgCO_2eq/km$		0.0440 $kgCO_2eq/km$	0.0111 $kgCO_2eq/km$	2022	Klimakompasset
Petrol (car)	2.1719 $kgCO_2eq/l$		0.6035 $kgCO_2eq/l$	0.1520 $kgCO_2eq/l$	2022	Klimakompasset
Ship, marine fuel oil			0.5200 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Ship, marine fuel oil			0.4736 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Train			0.1019 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Energy						
District heating		122.5 $kgCO_2eq/MW$			2020	Aalborg Forsyning
District heating			15,98 $kgCO_2eq/MW$		2019	Klimakompasset
District heating		110.1 $kgCO_2eq/MW$			2022	Aalborg Forsyning
District heating			11,33 $kgCO_2eq/MW$		2022	Klimakompasset
District heating		121.6 $kgCO_2eq/MW$			2023	Aalborg Forsyning
District heating			11,33 $kgCO_2eq/MW$		2022	Klimakompasset
Electricity		154.3 $kgCO_2eq/MW$			2019	Energinet
Electricity			43.38 $kgCO_2eq/MW$		2019	Klimakompasset
Electricity		162.5 $kgCO_2eq/MW$			2022	Energinet
Electricity			60.19 $kgCO_2eq/MW$		2022	Klimakompasset

Nordic Computer

A.5 Emission factors

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Topic	Scope 1	Scope 2	Scope 3	Biogenic	Year	Source
Energy						
Electricity		104.0 $kgCO_2eq/MW$			2023	Energinet
Electricity			60.19 $kgCO_2eq/MW$		2022	Klimakompasset
Travel, education and events						
Events, team building			0.0471 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Events, team building			0.0429 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Hotel and restaurant			0.0950 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Hotel and restaurant			0.0865 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Taxi – business travel			0.2083 $kgCO_2eq/km$		2019/22	Climatiq, BEIS/DEFRA (2022)
Training courses and education			0.0256 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Training courses and education			0.0233 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Materials						
Metal components			0.1890 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Paper and cardboard (recycled)			0.0244 $kgCO_2eq/DKK$		2019	Klimakompasset
Paper and cardboard (recycled)			0.0222 $kgCO_2eq/DKK$		2022	Klimakompasset
Plastic - unspecified			0.4785 $kgCO_2eq/DKK$		2019	Klimakompasset
Plastic - unspecified			0.4358 $kgCO_2eq/DKK$		2022	Klimakompasset
Polyethylene LDPE			1.793 $kgCO_2eq/kg$		2022	DEFRA (2023)
Polyurethane foam 18-25 kg/m^3			3.1800 $kgCO_2eq/kg$		2015	EUROPUR reviewed by DEKRA
Steel and iron (new)			0.6589 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Steel and iron (new)			0.6001 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Textile			0.0909 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Wood (new)			0.1226 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Wood (new)			0.1116 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Wood (new)			1.3627 $kgCO_2eq/kg$		2022	Klimakompasset
Supplies						
Food, general			0.0990 $kgCO_2eq/DKK$		2019	Klimakompasset

A.5 Emission factors

Continued from previous page.

Topic	Scope 1	Scope 2	Scope 3	Biogenic	Year	Source
Supplies						
Food, general			0.0901 $kgCO_2eq/DKK$		2022	Klimakompasset
IT services / software			0.0320 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
IT services / software			0.0291 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Office electronics			0.0617 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Office electronics			0.0562 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Office electronics			0.0803 $kgCO_2eq/DKK$		2019	Klimakompasset
Office electronics			0.0731 $kgCO_2eq/DKK$		2022	Klimakompasset
Premises						
Building maintenance			0.0813 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Building maintenance			0.0740 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Cleaning			0.0367 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Cleaning			0.0335 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Rent of premises			0.0400 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Rent of premises			0.0365 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Water consumption			0.0544 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Water consumption			0.0495 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Water consumption			0.7678 $kgCO2eq/m^3$		2022	Klimakompasset
Administration						
External consultancy			0.0367 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
External consultancy			0.0335 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Insurances			0.0185 $kgCO_2eq/DKK$		2019	EXIOBASE v3.3.16b2 (2020)
Insurances			0.0168 $kgCO_2eq/DKK$		2022	EXIOBASE v3.3.16b2 (2020)
Waste						
Electronics, landfilled			0.0765 $kgCO_2eq/kg$		2019/22	EXIOBASE v3.3.16b2 (2020)
Lead, landfill			0.0765 $kgCO_2eq/kg$		2019/22	EXIOBASE v3.3.16b2 (2020)
Steel and iron, landfill			0.0765 $kgCO_2eq/kg$		2019/22	EXIOBASE v3.3.16b2 (2020)

References

1. For an overview of approaches consult *Second-hand furniture and climate impact, Degree project in Industrial Ecology by Kolbrún Hrafnkelsdóttir at KTH Royal Institute of Technology, Stockholm, Digitala Vetenskapliga Arkivet:* https://www.diva-portal.org/smash/get/diva2:1680868/FULLTEXT01.pdf

2. Klimakompasset is an EU-supported service offered by the Danish Business Authority with the aim to make it relatively easy for SME's to establish an overview of their emissions: https://klimakompasset.dk/klimakompasset

3. Average fuel prices for petrol and diesel have been calculated from: https://www.drivkraftdanmark.dk/priser-og-forbrug

4. Energy density of different fuel sources: https://www.bts.gov/content/energy-consumption-mode-transportation-0

5. Complete list of all NACE codes: https://nacev2.com/en

6. https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2030-climate-energy-framework_en

7. See the following article *ICT industry to reduce greenhouse gas emissions by 45 per cent by 2030, the article includes a download link to the standard ITU L.1470 GHG emissions trajectories for the ICT sector compatible with the UNFCCC Paris Agreement:* https://www.itu.int/en/mediacentre/Pages/PR04-2020-ICT-industry-to-reduce-greenhouse-gas-emissions-by-45-percent-by-2030.aspx

8. Section 8.2 in the Danish Energy Agency's report *Denmarks Climate and Energy Outlook 2020 – Baseline Scenario Projection Towards 2030 With Existing Measures (Frozen Policy):* https://ens.dk/sites/ens.dk/files/Basisfremskrivning/deco_2020_27082020.pdf

9. Delivering the European Green Deal: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en#cleaning-our-energy-system

10. Our World in Data: https://ourworldindata.org/grapher/carbon-intensity-electricity?tab=chart

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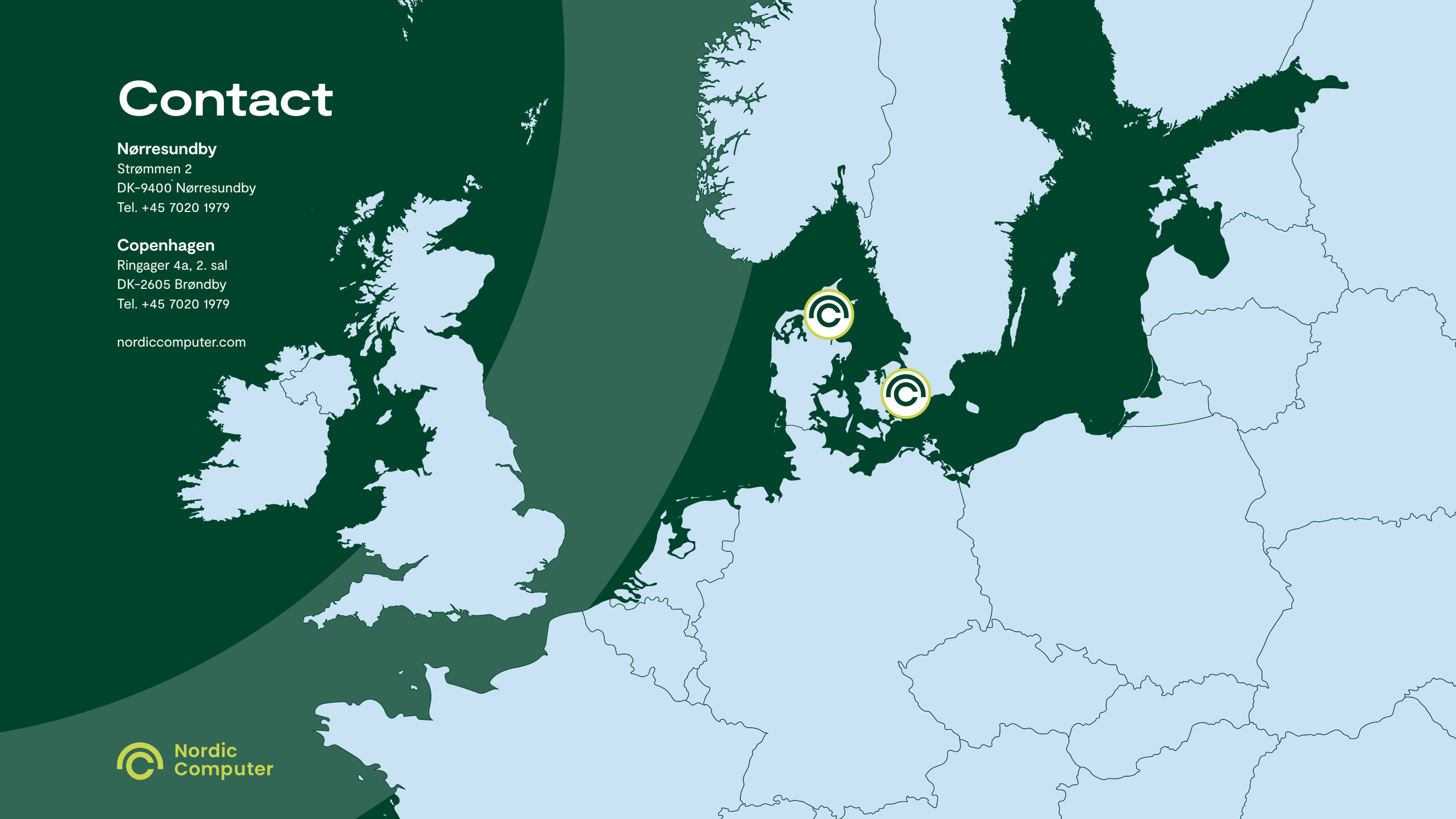

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